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## The Healthy Incentive for Pre-schools (HIP) Project: The Development, Validation, Evaluation and Implementation of an Healthy Incentive Scheme in the Irish Full Day Care Pre-school Setting.

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**The Healthy Incentive for Pre-schools (HIP)**  
**project:**  
**The development, validation, evaluation and**  
**implementation of an healthy incentive scheme in**  
**the Irish full day care pre-school setting.**

A thesis submitted for the degree of Doctor of Philosophy

*by*

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## **Abstract**

While many children are now cared for outside the home, inadequate nutrition and physical activity practices in pre-schools have been reported. This study aimed to develop a validated nutrition and health related evaluation tool and an education information resource for pre-schools, and determine whether their use can promote improved food service and nutrition and physical activity practices in this setting.

Following a pilot phase undertaken in Co. Wicklow ( $n = 12$ ), pre-schools providing a full day care service in the Midland Area of Ireland were invited to participate in the study ( $n = 100$ ). Direct observation was used to collect data (food and fluid provision; physical activity; outdoor time; staff practices and availability of nutrition and health resources) in each pre-school during one full day both prior to, and 6-9 months following the training period, using the specifically developed data collection tool, the Pre-school Health Promotion Activity Scored Evaluation Form. Post-intervention, self-assessment data were also collected using the same evaluation tool. All foods offered were recorded using household measures, and a photographic food atlas developed specifically for this project. A Delphi investigation was undertaken to identify pre-schools' most favoured incentives for project inclusion.

Of 76 services that registered interest in participating, pre-intervention data were collected in 58 facilities. Pre-schools were randomised into 2 training intervention groups: a 'manager only trained' group ( $n = 27$ ); and a 'staff and manager trained' group ( $n = 18$ ). Pre-intervention, poor nutrition and health practices were observed. Significant improvement ( $P < 0.05$ ) in nutrition and health related practice was observed within both intervention delivery groups in all areas evaluated; training of staff had no significant impact on overall practice. Scores assigned by direct independent observation were lower than pre-school self-assessment scores. Grant aid for food and physical activity, and project participation recognition, were the incentives most favoured by pre-schools.

This intervention was the first in Irish pre-schools to demonstrate that Pre-school Health Promotion Activity Scored Evaluation Form use supported by education improved practice with no significant additional effect of staff education.

## **Declaration Page**

I certify that this thesis which I now submit for examination for the award of Doctor of Philosophy (Ph.D.), is entirely my own work and has not been taken from the work of others, save and to the extent that such work has been cited and acknowledged within the text of my work.

This thesis was prepared according to the regulations for postgraduate study by research of the Dublin Institute of Technology and has not been submitted in whole or in part for another award in any other third level institution.

The work reported on in this thesis conforms to the principles and requirements of the Dublin Institute of Technology's guidelines for ethics in research.

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Signature \_\_\_\_\_ Date \_\_\_\_\_

Candidate

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This thesis is dedicated to my late Father, my

Mother, Peter and Alexander.



## Abbreviations List

<b>AAP</b>	American Academy of Pediatrics
<b>AHOY</b>	Atherosclerosis, Hypertension and Obesity in Youth
<b>ALSPAC</b>	Avon Longitudinal Study of Parents and Children
<b>~</b>	Approximately
<b>BMI</b>	Body Mass Index
<b>CCF</b>	Pre-school Characteristic Collection Form
<b>CECDE</b>	Centre for Early Childhood Development and Education
<b>cm</b>	Centimetres
<b>CMH</b>	Color me Healthy
<b>DAT</b>	Pre-school Detailed Assessment Tool
<b>DHSS</b>	Department of Health and Social Services
<b>DRVs</b>	Dietary Reference Values
<b>DS</b>	Deprivation Scores
<b>EAR</b>	Estimated Average Requirement
<b>ECCE</b>	Early Childhood Care and Education scheme
<b>EFSA</b>	European Food Safety Authority
<b>EU</b>	European Union
<b>FDC</b>	Full Day Care
<b>FSAI</b>	Food Safety Authority of Ireland
<b>&gt;</b>	Greater than
<b>g/d</b>	Gram per day
<b>g/dL</b>	Gram per decilitre
<b>HBSC</b>	Health Behaviour in School-aged Children

<b>HIP</b>	Healthy Incentive for Pre-schools
<b>HSE</b>	Health Service Executive
<b>in</b>	Inches
<b>INT</b>	Intervention
<b>kcal</b>	kilocalorie
<b>&lt;</b>	Less than
<b>L/day</b>	Litre/day
<b>M</b>	Month
<b>MI</b>	Minimal intervention
<b>min</b>	Minimum
<b><i>n</i></b>	Sample Size
<b>n/a</b>	Not Applicable
<b>NCCA</b>	National Council for Curriculum and Assessment
<b>NDNS</b>	National Diet and Nutrition Survey
<b>NHANES</b>	National Health and Nutrition Examination Survey
<b>NICHD</b>	National Institute of Child Health and Human Development
<b>NME sugar</b>	Non milk extrinsic sugar
<b>n/o</b>	Not Observed
<b>NPAG</b>	National Project Advisory Group
<b>P</b>	Significance
<b>PCCC</b>	Primary, Continuing and Community Care
<b>PRI</b>	Population Reference Intake
<b>PUFA</b>	Polyunsaturated Fatty Acid
<b>r</b>	Correlation Coefficient
<b>RDA</b>	Recommended Dietary Allowance

<b>REC</b>	Research Ethics Committee
<b>RNI</b>	Reference Nutrient Intake
<b>SD</b>	Standard deviation
<b>SECCYD</b>	Study of Early Child Care and Youth Development
<b>SEF</b>	Pre-school Health Promotion Activity Scored Evaluation Form
<b>std</b>	Standard
<b>TE</b>	Total Energy
<b>UK</b>	United Kingdom
<b>US</b>	United States
<b>USDA</b>	United States Department of Agriculture
<b>VOC</b>	Voice Of the Child
<b>Vs</b>	Versus
<b>WIC</b>	Women, Infants and Children

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# CHAPTER 1

## INTRODUCTION

The role of nutrition is understood to be vital for the healthy development of children, and health related habits learned early in life have been found to track into adulthood. Many experts have recommended that preventative health measures should focus on children in their early years. A large number of children worldwide spend much of their time in childcare and Ireland has, in recent years, followed this model. While many children in full time childcare spend a significant proportion of their day out of the home environment, little is known of the food provided in this setting in Ireland, and this information is necessary to inform early childhood education and health policy makers.

The Healthy Incentive for Pre-schools project is a PhD research intervention study that was carried out over a five year period (2008-2013). The project began in February 2008, with data collection commencing in June 2008, and data collection was completed in April 2012; it was undertaken on a part time basis by a community dietitian (CJM) working in the Community Nutrition and Dietetic Service of the Health Service Executive Dublin-Mid-Leinster (Midlands Area). The study took place in the midland counties of Laois, Offaly, Longford and Westmeath, Ireland, with pilot work in Co. Wicklow. The project was supported by *safefood* in association with the Health Service Executive. This project is the first such study to examine nutrition and health related practice in pre-schools in Ireland using a specifically developed and validated tool.

This thesis is divided into seven chapters. In **Chapter 1** an introduction to the PhD thesis is outlined. **Chapter 2** provides a comprehensive review of the literature and outlines the nutritional requirements of young children; nutrition and health related issues specific to children of pre-school age; the effect of different practices on growth, development and future eating patterns; guidelines for best nutrition and health related practice in the childcare setting; and evidence for motivating change in practice and for the development of a motivational tool for this setting. The overall aims and objectives of the study and the general methods employed in the research are outlined in **Chapter 3** including the development, pilot and validation of the specifically developed project evaluation tool, the Pre-school Health Promotion Activity Scored Evaluation Form; the pre-intervention audit using the Pre-school Health Promotion Activity Scored Evaluation Form of all pre-schools providing full day care enrolled in the project in the Midlands; the development of a tailored Pre-school Education Resource Pack to accompany the Pre-school Health Promotion Activity Scored Evaluation Form; the delivery of training on use of the Pre-school Health Promotion Activity Scored Evaluation Form and Pre-school Education Resource Pack to two groups: ‘minimal intervention’ (‘manager only’ training) and ‘intervention’ (‘manager and staff’ training); the measurement of change in practice post-intervention using the Pre-school Health Promotion Activity Scored Evaluation Form; the investigation of an appropriate reward model to act as motivation and incentive to participate in the programme; and two additional phases that were also completed: the development of a Food Serving Size Atlas and the investigation of the Voice of the Child in the full day care pre-school setting. **Chapter 4** provides a detailed description of the study undertaken to determine pre-intervention data relating to food service, and nutrition and physical activity practices while **Chapter 5** describes the data collected in the post-intervention phase of

the project and outlines a comparison of these to the data gathered pre-intervention. An overview of the Delphi investigation undertaken to determine pre-school managers' favoured incentives for inclusion in this health promotion project, and its results, is presented in **Chapter 6**. A detailed discussion of the overall project findings is outlined in **Chapter 7** together with an overview of possible project limitations and conclusions. Recommendations for the direction of potential future work and policy are also provided for consideration.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The placement of children in care outside the home has increased rapidly in Ireland in recent years. Between 2002 and 2007, an increase of 42-48% was reported in the number of households using out-of home care (Central Statistics Office (Ireland), 2009). In 2006, it was noted that there was little research on a national level regarding the characteristics of non-parental childcare in Ireland (Mahoney & Hayes, 2006). In 2007 it was reported that the most common types of non-parental care were: an unpaid relative; a childminder / au pair or nanny; or a crèche, Montessori, playgroup or after-school facility. The use of a crèche / Montessori or play group for pre-school children increased from 14% of households in 2002 to 24% of households in 2007 (Central Statistics Office (Ireland), 2009). The more recent Growing Up in Ireland study reported that 38% of Irish 9 month old children participate in non-parental childcare for more than eight hours per day, with 11% attending crèches or pre-school centres (Growing Up in Ireland, 2011). By the age of 3 years, 50% of children attend out of home childcare (Growing Up in Ireland, 2011). National policy encourages more women to enter the workforce thus increasing the need for non-parent care in the community. In the latter part of the decade 2000-2009, just over sixty percent (60.8%) of women were in the workforce in Ireland (Central Statistics Office (Ireland), 2008),



with rates of part-time work for women rising from 21% of those employed in 1993, to 31% in 2003 and 32% in 2007 (Russell & McGinnity, 2011). Interestingly, the working arrangements of parents impact on use of childcare in Ireland; 68% of pre-school aged children who lived with both parents used childcare when both parents were working; 59% used it when the mother worked part time and the father worked full time while only 29% used it when the father did not work and the mother worked full time (Central Statistics Office (Ireland), 2009).

With an increase in demand for childcare, successive governments have directed funding to the creation of childcare places in the community (not for profit) and private (for profit) sectors; the National Childcare Strategy 2006-2010 (National Children's Office, 2006) aimed to develop the childcare infrastructure in Ireland; with a budget of €575 million, an increase of 50,000 childcare places was estimated. Much of the funding was indirectly given in the form of capital grants, to encourage both the private and community sector to provide childcare places, this in contrast to other northern countries in Europe where emphasis is placed on state provision of pre-school services (Growing Up in Ireland, 2013).

The definition of a 'full day care pre-school service' differs depending on the country in which it is offered; in the United Kingdom (Surestart, 2012) it is defined as '*day care for children under eight for a continuous period of four hours or more in any day*', while in Ireland it is defined as '*a pre-school service offering a structured day care service for pre-school children for more than 5 hours per day; and which may include a sessional pre-school service for pre-school children not attending the full day care*'; while a sessional pre-school service is '*a pre-school service offering a planned programme to pre-school children for a total of not more than 3.5 hours per session*' (Department of Health and Children (Ireland), 2006). As a child who attends pre-school

on a full time basis could potentially spend ten hours every day, five days per week and forty-eight weeks of the year in care, responsibility has to be placed on child care facilities to provide sufficient nutrition and a conducive environment to encourage healthy food habit formation (Bristow *et al.*, 2011). The National Institute of Child Health and Human Development (NICHD) Study of Early Child Care and Youth Development (SECCYD) in the United States reported that the average time spent by 4½ year old children in non-maternal care was 27 hours per week (Eunice Kennedy Shriver National Institute of Child Health and Human Development *et al.*, 2006).

In 2007, pre-school aged children in Ireland were found to spend on average 24 hours per week in non-parental care. A link was reported between the number of hours spent in childcare and the age of a child, with 1 year old children spending 28 hours in childcare compared to 4 year olds spending only 19 hours, this difference being thought to reflect the period of transition to primary school (Central Statistics Office (Ireland), 2009). A more recent study of a sample of children in Ireland reported similar findings, with the average 3 year old spending 23 hours per week (Growing Up in Ireland, 2011) and the average nine month old spending 29 hours weekly, in non-parental care (Growing Up in Ireland, 2011).

Currently, in Ireland, there is no uniform formal training for pre-school providers on nutrition and healthy food provision, nor does the legislation to enforce such training exist. 'Food & Nutrition Guidelines for pre-schools' (Department of Health and Children (Ireland), 2004) are available but are not mandatory, which would suggest that methods to encourage the provision of nutritious food in this setting must be pursued. Childcare regulations (Department of Health and Children (Ireland), 2006) govern the provision of out-of-family care and inspections of childcare premises are made on a regular basis; in order to assess the health, safety and welfare, and promote

the development of children attending pre-school services; however, little else is known about the nutrition and health related practices in these settings.

Ireland is no different to other countries in relation to placement of children in childcare, and with many people worldwide now accessing and using out of home childcare, researchers have called for studies that will allow ‘*an understanding of current practices relevant to nutrition and physical activity in child-care settings*’ (Larson *et al.*, 2011). With many children spending many hours per week in out-of-home care, the need to determine such practice in this setting is warranted.

While the quality of early care for children has been noted to impact on cognitive and school achievement from pre-school age to adolescence (Vandell *et al.*, 2010), public health concern has been expressed regarding the nutritional quality and amount of food served in the pre-school setting (Briley & McAllaster, 2011). The provision of adequate and appropriate nutrition during early childhood is essential for growth and development and cannot be overestimated. Many studies have demonstrated the importance of proper nutrition at an early age for healthy physical, psychological and social development (Lozoff *et al.*, 2000; Flynn *et al.*, 2006); while it has been reported that there is a sensitive time period in early childhood during which appropriate nutrition must be provided to prevent development of disease in later life (Koletzko *et al.*, 2011). During infancy and early childhood, the supply of sufficient energy and nutrients is essential to ensure normal growth and development of the child (Food Safety Authority of Ireland, 1999a; Department of Health and Children (Ireland), 2004; Crawley, 2006). Food related experiences in the first 2 years of life have been shown to influence dietary variety in school aged children (Skinner *et al.*, 2002). Healthy nutrition (Singer *et al.*, 1995; teVelde *et al.*, 2007) and physical activity habits (Telama, 2009) developed in childhood have been found to track into adolescence and

beyond, while evidence also exists that exposure to poor practice may lead to unhealthy habits that persist into adulthood (Batsell *et al.*, 2002). With this in mind, the need to ensure best practice in relation to nutrition and physical activity is paramount. The American Dietetic Association notes that '*childcare regulations represent minimum standards, or "the floor"*. *Actual practice of child-care programs should exceed standards put forth in state regulations*' (American Dietetic Association, 2011). While a small number of studies give us insight into such practice in Ireland (Jennings *et al.*, 2011; Johnston Molloy *et al.*, 2011), it would appear that in many other countries poor nutrition and physical practice have also been documented; in the United Kingdom (UK) (Moore *et al.*, 2005; Parker *et al.*, 2011), the United States (US) (Ball *et al.*, 2008; Sigman-Grant *et al.*, 2008; Erinoshio *et al.*, 2011; Sisson *et al.*, 2012), Australia (Zask *et al.*, 2012) and Holland (Gubbels *et al.*, 2010).

Although there is much cross sectional research outlining practice (Erinoshio *et al.*, 2011; Parker *et al.*, 2011), little data are available in relation to intervention studies with, to our knowledge, no evidence of intervention research in this area in Ireland. Many studies rely on reported practice (Lloyd-Williams *et al.*, 2011) with few based on researcher observation of practice in the childcare setting, considered the 'gold standard' (Gittelsohn *et al.*, 1994).

As an introduction to the study which is described in this thesis, a review of the literature was undertaken. This review outlines the nutritional requirements of young children; nutrition and health related issues specific to children of pre-school age; the effects of different practices on growth, development and future eating patterns; guidelines for best nutrition and health related practice in the childcare setting; and evidence for motivating change in practice and for the development of a motivational tool for this setting.

## **2.2 Nutritional requirements of the pre-school age child**

### **2.2.1 Importance of nutrition in early childhood**

Research has demonstrated that nutrition in pregnancy has an effect on lifelong health in humans (Barker, 1995). Young children have micronutrient requirements that are, relative to their energy needs, much higher than those of adults; therefore, it is necessary that the nutrient density of their diet is high (Dwyer *et al.*, 2010) and it has been said that *'pre-school children continue to be nutritionally vulnerable although their growth rates are slower than that in infancy'* (Dwyer, 1993). Indeed, Doyle *et al.*, (2009) recommended that *'intervening in the zero-to-three period, when children are at their most receptive stage of development, has the potential to permanently alter their development trajectories and protect them against risk factors present in their early environment'*. In 2011, results of the Early Nutrition Programming Project (EARNEST) were published outlining that a difference in nutrition provision at important points in early life, both *in utero* and after birth, can program or effect a person's development, metabolism and health (Koletzko *et al.*, 2011). It has been reported that patterns of growth in early life are associated with an increased risk of developing metabolic syndrome in later life; with body composition potentially playing a role in the programming of such diseases, being itself influenced by early growth (Wells *et al.*, 2007). Studies have shown that rapid weight gain in infancy, which may follow foetal growth retardation, is an important risk factor for developing childhood obesity and insulin resistance (Dunger *et al.*, 2007).

During infancy and early childhood, a supply of adequate energy and nutrients is essential to ensure normal growth and development of the child (Food Safety Authority

of Ireland, 1999a; Department of Health and Children (Ireland), 2004; Crawley, 2006). Nutrient intakes have been shown to track from pre-school into the early school years, with the strongest association over time being for carbohydrate and fat, in particular total and monounsaturated fat; children with the most extreme intakes of nutrients, either very high or very low appear to be the most likely to sustain this pattern of intake over time (Singer *et al.*, 1995). Many publications and resources outline recommendations for dietary intake in infants and young children (Department of Health and Children (Ireland), 2004; Department of Health and Children (Ireland), 2005).

### **2.2.2 Recommended Dietary Allowances (RDAs) for Ireland**

A working group was established by the Food Safety Authority of Ireland in 1996 to undertake a review of the Irish Recommended Dietary Allowances that were compiled in 1983. The group updated the 1983 Recommended Dietary Allowances and based the new recommendations on Population Reference Intakes of the European Union, with the exception of folate, iron, calcium and vitamin C. The group adopted the United Kingdom's Dietary Reference Values for infants under the age of one year as these were believed to be more comprehensive than the European Union recommendations.

In 1993, the European Scientific Committee for Food developed new nomenclature for dietary recommendations based on frequency of distribution of individual requirements: The 'Average Requirement' or mean requirement of the population; the 'Lowest Threshold Intake', the mean requirement minus 2 standard deviations (the intake level below which nearly all individuals will be unable to maintain metabolic integrity); the 'Population Reference Intake', the mean requirement plus two standard deviations (the intake level which would meet the dietary

requirements of nearly all (97.5%) of the healthy population). In Ireland, the Recommended Dietary Allowance is equivalent to the European Union's Population Reference Intake. The European Union devised the three reference levels because the meaning of the single Recommended Dietary Allowance was often misunderstood: although *'being clearly defined as substantially more than an individual needs, the Recommended Dietary Allowance is often regarded as the lowest acceptable intake for the majority of the population'* (Food Safety Authority of Ireland, 1999b).

With this in mind, however, it must be noted that recently the European Food Safety Authority has been requested to review and update the Dietary Reference Values for nutrients and energy that were developed by the European Scientific Committee on Food in 1993, and Ireland as a Member State will look to these updated Dietary Reference Values for guidance.

To date, the European Food Safety Authority's Panel on Dietetic Products, Nutrition and Allergies has developed general principles for establishing Dietary Reference Values and has created Dietary Reference Values for energy, carbohydrate, dietary fibre, fat, and water and has provided scientific advice on the setting of tolerable upper limits of intake for vitamins and minerals (European Food Safety Authority, 2013). All draft opinions developed are subject to public consultation with all European Union Member States and the scientific community before they are finalised. This development and consultation process is currently ongoing. The European Commission has also requested that the European Food Safety Authority aids all authorities in Member States to translate nutrient-based recommendations into practical food based dietary guidelines. To date, although recent Scientific Recommendations for Healthy Eating in Ireland have been published (Food Safety Authority of Ireland, 2011a), no such food based dietary guidelines have been established for children under the age of

five in Ireland. The Food Safety Authority of Ireland has, however, updated the Scientific Recommendations for a National Infant Feeding Policy (Food Safety Authority of Ireland, 2011b) which provides guidance on nutrition in pregnancy, and in the first year of life: breastfeeding, formula feeding and the introduction of complementary foods.

**Table 2.1** outlines the Food Safety Authority of Ireland's Recommended Dietary Allowances for infants aged 0-12 months (Food Safety Authority of Ireland, 1999b), which is based on the United Kingdom's Dietary Reference Values for this age group while **Table 2.2** outlines the Recommended Dietary Allowances for children aged 1-3 and 4-6 years, both age categories being within the 'pre-school' age range of < 5 years.



**Table 2.1 Irish Recommended Dietary Allowances for infants from 0-12 months  
(based on United Kingdom's Dietary Reference Values)**

Age (months)	0-3	4-6	7-9	10-12
<b>Weight* (where applicable)</b>	<b>5.9</b>	<b>7.7</b>	<b>8.8</b>	<b>9.7</b>
Energy MJ/d				
Males	2.28	2.89	3.44	3.85
Females	2.16	2.69	3.20	3.61
Protein (g/d)	12.5	12.7	13.7	14.9
Vitamin A <sup>#</sup> (µg/d)	350	350	350	350
Thiamin (mg/d)	0.2	0.2	0.2	0.3
Riboflavin (mg/d)	0.4	0.4	0.4	0.4
Niacin <sup>†</sup>	3	3	4	5
Vitamin B <sub>6</sub> (mg/d)	0.2	0.2	0.3	0.4
Vitamin B <sub>12</sub> (µg/d)	0.3	0.3	0.4	0.4
Folate (µg/d)	50	50	50	50
Vitamin C (mg/d)	25	25	25	25
Vitamin D (µg/d)	8.5	8.5	7	7
Calcium (mg/d)	525	525	525	525
Magnesium (mg/d)	55	60	75	80
Sodium (mg/d)	210	280	320	350
Potassium (mg/d)	800	850	700	700
Chloride <sup>‡</sup> (mg/d)	320	400	500	500
Iron (mg/d)	1.7	4.3	7.8	7.8
Zinc (mg/d)	4.0	4.0	5.0	5.0
Copper (mg/d)	0.3	0.3	0.3	0.3
Selenium (µg/d)	10	13	10	10
Iodine (µg/d)	50 <sup>‡</sup>	60	60	60

\* where applicable

# µg retinol equivalent/d

† mg niacin equivalent/1000 kcal

‡ formula fed

‡ corresponds to sodium 1 mmol = 35.5 mg

(Department of Health and Social Services United Kingdom, 1991)

**Table 2.2 Irish Recommended Dietary Allowances for young children (1-6 years)**

Age (months)	1-3	4-6
Protein (g/kg body weight/d)	1.1	1.0
n-6 PUFA <sup>a</sup> (% dietary energy)	3	2
n-3 PUFA <sup>a</sup> (% dietary energy)	0.5	0.5
Vitamin A (µg/d)	400	400
Thiamin (µg/MJ)	100	100
Riboflavin (mg/d)	0.8	1.0
Niacin (mg/MJ)	1.6	1.6
Vitamin C <sup>c</sup> (mg/d)	45	45
Vitamin B <sub>6</sub> (µg/g protein)	15	15
Folate <sup>c</sup> (µg/d)	100	200
Vitamin B <sub>12</sub> (µg/d)	0.7	0.9
Vitamin D (µg/d)	10	0-10
Calcium <sup>c</sup> (mg/d)	800	800
Phosphorus (mg/d)	300	350
Potassium (mg/d)	800	1100
Iron <sup>c</sup> (mg/d)	8	9
Zinc (mg/d)	4	6
Copper (mg/d)	0.4	0.6
Selenium (µg/d)	10	15
Iodine (µg/d)	70	90

<sup>a</sup> Polyunsaturated fatty acids; <sup>b</sup> Retinol equivalents

Irish recommendations for infants (0-12 months) are outlined in Table 2.1

<sup>c</sup>Recommendations for dietary vitamin C, iron, folate and calcium are based on Irish 1983 Recommended Dietary Allowances

Irish energy requirements are outlined in Table 2.3

Overall table from the Recommended Dietary Allowances for Ireland (Food Safety Authority of Ireland, 1999b)

**Table 2.3** outlines the Irish recommended energy requirements of children aged 18 months to 4.5 years of age. These energy requirements are derived from the European Union Population Reference Intake recommendations for energy as they are more specific than the Irish 1983 recommendations; giving guidance at specific ages, rather than over age ranges, and separate guidance on energy requirements for boys and girls.

**Table 2.3 Children’s energy requirements (Ireland) (18 months-4.5 years)**

Age	Average weight (kg)		Estimated energy requirements (MJ/d)	
	Boys	Girls	Boys	Girls
18 months	11.5	11.0	4.6	4.40
24 months	12.5	12.0	5.00	4.80
30 months	14.0	13.0	5.60	5.20
36 months	15.0	14.0	6.00	5.60
3.5 years	15.5	15.0	6.10	5.65
4.5 years	17.5	17.0	6.55	6.20

From the Recommended Dietary Allowances for Ireland (Food Safety Authority of Ireland, 1999b)

### 2.2.3 Nutrients of specific interest to the pre-school aged child

Evidence suggests that young Irish children’s diets are low in vitamin A, vitamin C, iron and zinc and that their diets contain high quantities of salt and sugar (Walton *et al.*, 2007).

An Australian cross-sectional study of children aged 1-5 years (*n* 300) reported inadequate intakes of dietary fibre and n-3 polyunsaturated fatty acids although the majority had adequate intakes of iron, zinc, calcium and vitamin C (Zhou *et al.*, 2012). In the United Kingdom, iron, zinc and vitamin D intake below Reference Nutrient Intake levels have been reported (Emmett *et al.*, 2002). A correlation was also noted between fat and other nutrient intakes in this age group, with an increased risk of suboptimal zinc and retinol intake with lower fat intakes and the consumption of iron and vitamin C falling as fat intake increased (Rogers *et al.*, 2002). Examination of data from the United Kingdom’s National Diet and Nutrition Survey (*n* 1675) (Watt *et al.*, 2001) showed that few pre-school aged children had diets that were nutritionally adequate with only 1% meeting five Reference Nutrient Intakes for iron, zinc, vitamin A, vitamin C and non-milk extrinsic sugar, and 15.6% meeting none of the recommendations. Only 12.5% had intakes of non-milk extrinsic sugars within the

levels recommended. The youngest age group had the poorest iron intake with 15.9% of 1-3 year old children not meeting this Reference Nutrient Intake level. Ability to meet dietary recommendations was also found to be related to socio-economic measures, most notably maternal education levels (Watt *et al.*, 2001), with children from households whose mother had fewest qualifications meeting the least number of dietary recommendations.

Comparison of group mean findings to the Reference Nutrient Intake, equivalent to the Recommended Dietary Allowance or Population Reference Intake may, however, be misleading, as these levels refer to the recommendations that would ensure coverage for 97.5% of the healthy population. Comparison to the 'Average Requirement' may be more appropriate in this situation. In the summary report of the Irish National Pre-school Nutrition Survey (Irish Universities Nutrition Alliance, 2012), intakes were deemed to be inadequate by the determination of the percentage of children with intakes of vitamins and minerals below the United Kingdom's Estimated Average Requirements. While it was found that that majority of pre-school children had adequate vitamin and mineral intakes, it was estimated that 14-22% of 2-4 year olds had an inadequate intake of vitamin A and 23% of 1 year olds, 10% of 2 year olds and 11% of 3 year olds were estimated to have an inadequate intake of iron. The study authors reported that in the absence of consensus regarding Estimated Average Requirements for vitamin D, 70-84% of 1-4 years had intakes of vitamin D less than 5 µg and 17-25% had intakes less than 1 µg, indicating '*that a significant proportion of children may be at risk of inadequate intakes of vitamin D, particularly in winter*'.

#### **2.2.4 Food based dietary guidelines: Food Pyramid**

In the United States, data tracking dietary intakes have been converted to servings from the Food Pyramid allowing comparison of national data to the dietary guidelines for Americans (Partington & Nitzke, 2000). A study of three day dietary histories of American Indian pre-school children aged 2-5 years found that Food Pyramid recommendations for fruit and vegetable intake were not being met while intakes of added sugar exceeded those recommended (La Rowe *et al.*, 2010). Analysis of data from the Feeding Infants and Toddlers Study, which assessed the diets of children aged 2-3 years in the United States, reported similar results. In the national random sample studied (*n* 1461), approximately one quarter to a third consumed whole milk once per day and about 70% consumed vegetables once per day. However, French fries were the most common vegetable consumed. While over 70% consumed fruit once per day, nearly 60% of children consumed fruit juice; and over 80% consumed either a sweetened beverage or dessert or a sweet or salty snack every day (Fox *et al.*, 2010). In a Canadian study which compared the diets of pre-school aged children (44-56 months) measured through 24 hour dietary recall, to Canada's Food Guide to Healthy Eating, it was determined that the mean number of servings from the four main food groups came close to that recommended, but that less than 2% of children met the dietary guidelines for all four food groups at the same time (Dubois *et al.*, 2011); however, considering that it is recommended that a 'meal' should contain food from all of the four main food groups (Benjamin, 2007), this is an interesting finding.

In Ireland, the Food Pyramid is the education tool used for the provision of food based dietary guidelines for different age groups. Although in recent years, the Food Pyramid has been revised and updated for those over the age of 5 years (Food Safety Authority of Ireland, 2012b); this has not been carried out, to date, for the pre-school

aged child. The Food and Nutrition Guidelines for Pre-school Services were developed in 2004 to provide guidance on many aspects of nutrition for this setting and include the recommended food groups and serving sizes for different age groups as outlined in **Table 2.4** (Department of Health and Children (Ireland), 2004).

**Table 2.4 Recommended number of daily servings and food serving size for pre-school aged children (Ireland)**

Food shelf	1-3 years	3-5 years	Serving size
Meat, fish and alternative shelf	2 small servings	2 servings	An average sized pork or lamb chop or homemade beef burger 2 slices (60 g) lean roast/ boiled / grilled / oven baked meat, chicken or turkey Medium sized fillet of fish or 2 fish fingers 2 eggs 9 dessertspoons of baked beans, peas or lentils
Milk, cheese and yoghurt shelf	3 servings	3 servings	1 glass of milk (200 mL) 1 carton of yoghurt 30 g hard cheese 2 cheese slices
Fruit and vegetables shelf	2-4 servings	4 or more servings	1 bowl of milk pudding (100 g) 1 medium sized fruit (50 g) e.g. apple, orange or banana ½ glass (100 mL) pure unsweetened fruit juice, diluted. 3 dessertspoons stewed / tinned fruit in own juices / fresh fruit 3 dessertspoons chopped raw, salad or cooked vegetables Small bowl of home-made vegetable soup
Breads, cereals and potato shelf	4 servings	4-6 or more servings	1 slice of bread (white or wholegrain) 1 small bread roll 1 small bowl of breakfast cereal 1 small scone (plain, wholemeal or fruit) 1 medium potato (60 g) – boiled or baked 3 dessertspoons boiled rice or boiled pasta (80 g)

200 mL (½ pint)

From 'Food and Nutrition Guidelines for Pre-school Services' (Department of Health and Children (Ireland), 2004).

### **2.2.5 Macro and micronutrient intakes in the Irish pre-school age child**

The Irish Health Behaviour in School-aged Children (HBSC) study (Nic Gabhainn *et al.*, 2007) stated that 19% of Irish children aged 9-18 years reportedly ate fruit more than once a day; with 39% reportedly eating sweets, and 26% drinking soft drinks more than once per day. Data from the Irish National Children's Food Survey (Joyce *et al.*, 2007) showed that Irish children aged 5-12 years obtained a higher energy intake from added sugars than Irish adults (14.6% *vs.* 9.3%). When mean daily intake was studied, a percentage of Irish 5-12 year old boys and girls did not reach their average requirement for vitamin A (20% boys; 25% girls); folate (18% boys; 32% girls); calcium (22% boys; 30% girls) or iron (13% boys; 30% girls); while mean daily salt intake exceeded target levels for total salt in the 5-10 year age category (Walton *et al.*, 2007).

In the summary report of the National Pre-school Nutrition Survey (Irish Universities Nutrition Alliance, 2012), fruit juice consumption reportedly increased from 23 g per day at one year of age to 77 g per day at the age of 4 years; sugared soft drink consumption increased from 21 g per day at 1 year to 77 g per day at 4 years; while soft drink and low calorie drink consumption increased from 68 g per day at one year to 111 g per day at 4 years. Fresh meat intake approximately doubled from 1-4 years from 7 g per day to 15 g per day, with processed meat also increasing, from 16 g per day to 34 g per day in the same age group.

Protein provided 15-16% total energy, fat 32-24% total energy and carbohydrate 50-54% total energy across the 1-4 year age range studied. Mean energy intake, measured in kilocalories (kcal), increased from 1005 kcal at one year to 1264 kcal by the age of 4 years. Non-milk sugar consumption increased with age from 16% total energy at 1 year to 20% total energy at age 4 years. All ages of children had intakes that

exceeded the Food Safety Authority of Ireland's target level for salt intake with intakes of 2.3 g per day at one year increasing to 3.6 g per day at the age of 4 years.

## **2.3 Nutritional issues affecting the pre-school age child**

### **2.3.1 Nutrition and chronic disease risk**

A link between poor nutrition in early life and chronic disease risk in later life has been outlined (Koletzko *et al.*, 2011), with pre-school age children being particularly at risk from the effect of inadequate nutrition on their later physical and cognitive development (Watt *et al.*, 2001). An assessment of the long-term effects of under nutrition on adult human capital, i.e. height, school achievement, economic productivity and offspring birth weight, demonstrated that under nutrition in childhood was strongly linked with shorter adult height, lower education level attained, being economically less productive and having offspring with lower birth weight. Rapid postnatal weight gain, especially if this occurs after the period of infancy (0-12) months, was linked with risk factors for high blood glucose and blood pressure, poor blood lipids and mental illness. Height for age at two years old was noted to be the best predictor of human capital, with under nutrition being linked with lower human capital. The authors concluded that chronic diseases are most prevalent in undernourished children who gained weight quickly in the period following their infant years (Victora *et al.*, 2008).

The American Heart Association Committee on Atherosclerosis, Hypertension and Obesity in Youth outlines the need for a 'population-based approach' which aims to modify the food and physical activity environment of children, as programmes that



begin in the pre-school have the capability of influencing cardiovascular health of many children and young people (Hayman *et al.*, 2004).

### **2.3.2 Iron deficiency**

Iron is essential for normal neurodevelopment (Georgieff, 2007). The prevalence of iron deficiency anaemia and its effect on cognitive development has been widely described (Lozoff *et al.*, 2000; Halterman *et al.*, 2001), with a cause and effect relationship established between dietary iron intake and normal cognitive development (European Food Safety Authority Panel on Dietetic Products Nutrition and Allergies, 2013). Risk of developing anaemia is associated with the iron density of a child's diet from 6-9 months of age (Hadler *et al.*, 2004). At the age of eighteen months it has been shown that children with higher milk and dairy product intakes have lower ferritin levels (reflecting total iron stores) (Cowin *et al.*, 2001) with the authors recommending that meat, fish, fruit and vegetables should be encouraged in this age group due to their effect on haemoglobin levels. A marked positive effect on iron absorption has been seen when meat is added to the weaning diet (Hallberg *et al.*, 2003).

A randomised non-blinded study in Brazil investigated the impact of an education intervention aimed at day care educators. The intervention aimed to determine whether the training of pre-school educators would act as a useful tool to reduce the prevalence of anaemia amongst children attending day care; the researchers defined anaemia as a haemoglobin concentration of < 11.0 g /dL. Four pre-schools took part in the intervention arm and four pre-schools acted as controls. The intervention involved pre-school staff attending a 40 hour course; the '*Nutrition and Health: Training for Day Care Educators and Managers*'; this was followed with full day staff supervision visits to each pre-school service to enable reinforcement of education in

everyday practice. Parent interview, anthropometry and blood were collected from 252 children in the study at baseline and 7 months post-intervention. The children in the control group had a significantly greater risk of developing anaemia (twice the risk) than those children in the intervention group at the end of the study, though there was no significant difference at baseline. Although the study authors caution against generalising the results due to the convenience sampling employed, they note that this type of intervention may be useful in the promotion of improved haemoglobin levels in poor communities with low socio-economic status (Konstantyner *et al.*, 2011).

### **2.3.3 Fluids and hydration**

Dehydration has been described as a reduction in body mass due to fluid loss that is greater or equal to one percent (Kleiner, 1999). Fluid requirements relative to body weight are high during childhood, and children are more at risk of dehydration than adults (D'Anci *et al.*, 2006). The European Food Safety Authority (2010) has developed Dietary Reference Values for water; in these, they recommend that infants aged 12-24 months should receive 1.1-1.2 L/day; children aged 2-3 years: 1.3 L/day and children aged 4-8 years: 1.6 L/day.

Drinking habits are developed in childhood making it necessary to ensure children learn to drink suitable fluids to maintain sufficient hydration levels (Benelam & Wyness, 2010). However, although milk and water are encouraged as the most tooth friendly drinks for infants and children (Department of Health and Children (Ireland), 2004), and calcium found in milk is recommended for the prevention of osteoporosis (Nicklas, 2003), many children are reported to consume large quantities of drinks other than milk or water (Petter, 1995; Marshall *et al.*, 2005).

In 2001, the American Academy of Pediatrics (AAP) noted that 100% fruit juice had no nutritional benefit over whole fruit for children or infants older than six months, and recommended that 100% fruit juice should be limited to 120 – 180 mL/day (4 to 6 oz/day) for children aged 1 to 6 years (American Academy of Pediatrics Committee on Nutrition, 2001). It has also been noted that any intake of 100% fruit juice is associated with a larger amount of dental caries in one to five year old children (Marshall *et al.*, 2005), while a large cross sectional study in the school environment in Italy reported a statistically significant inverse relationship between milk consumption and body mass index ( $P=0.003$ ); with high milk consumers of milk having the lowest body mass index (Barba *et al.*, 2005). Exploration of national beverage intake data (1977-2001) in the United States demonstrated that across a sample of 73,345 individuals over the age of two years, across all age groups, including adults, the consumption of sugar sweetened beverages has increased while that of milk has decreased; energy from sweetened beverages increased by 135% and energy from milk was reduced by 38% (Nielsen & Popkin, 2004). This increased consumption of sugar sweetened soft drinks is not limited to the United States. A recent study of European adults reported high intakes of these drinks and demonstrated a link between their intake and the development of type 2 diabetes (InterAct Consortium, 2013).

Two Irish studies examined fluid provision practices amongst infants and children: a study carried out into weaning practices of infants aged 6 months, in a Dublin setting, determined that 57% of the sample was given juice rather than water as a supplementary fluid and 33 of 401 mothers reported the provision of sugar containing supplementary fluids (Tarrant *et al.*, 2010), while a pilot study of 202 healthy 5 year old children in fluoridated and non-fluoridated areas of County Cork demonstrated a 47% overall prevalence of tooth erosion (fluoridated and non-fluoridated combined), with

progression of this erosion to the dentine or pulp of the tooth in 21% of the sample. An association was also noted between dental erosion and low socio-economic status and with fruit squash and carbonated drink consumption (Harding *et al.*, 2003).

### **2.3.4 Overweight and obesity**

#### ***2.3.4.1 Prevalence***

Studies have demonstrated that children who exhibit early ‘adiposity rebound’ (a second rise in body mass index that occurs across the centiles between ages 3 and 7 years) have an increased likelihood of being overweight and obese during adolescence (Rolland-Cachera *et al.*, 1984) and adulthood (Whitaker *et al.*, 1998). Singh and colleagues (2008) carried out a systematic review of the literature to determine the factors associated with persistence of obesity into adulthood; twenty five studies were included in this review, encompassing studies that had a retrospective or prospective longitudinal design; each of the studies reported an increased risk of overweight and obesity persisting from childhood into adolescence and adulthood. It is interesting to note, however, that an exclusion criterion for this review was participation in any obesity related or health promotion related intervention, therefore limiting the exploration of the effect of such interventions on overweight and obesity.

In 2011, it was estimated that 40 million children under the age of 5 years worldwide were overweight (World Health Organisation, 2013). Obesity is now considered to be a global epidemic (World Health Organisation, 2000). In 2002, Ogden *et al.*, (2002) presented findings from the National Health and Nutrition Examination Survey data collection period (1999-2000); the prevalence of overweight amongst children aged 2-5 years was 10.4%, compared to 7.2% (1988-1994); and 5% (1976-

1980). In infants, 6 months to 23 months, there was an 11.6% prevalence of overweight (1999-2000) compared to 8.9% (1988-1994) and 7.2% (1976-1980). Following on from this, Ogden *et al.*, (2006) reported that overweight prevalence amongst 2- to 5- year old children in the United States had increased to a level of 13.9% (2003-2004), with 15.1% of boys and 12.6% of girls overweight. A more recent study focusing on trends in overweight among low income families of children aged 2-4 years, noted a significant ( $P < 0.01$ ) increase in overweight across 30 states in the United States (Sherry *et al.*, 2004) while a study of low income children aged 3-5 years enrolled in Head Start pre-schools in Mississippi demonstrated a 20.6% prevalence of overweight with the incidence highest amongst boys, non-Hispanic Blacks and those aged 5 years (Harbaugh *et al.*, 2009). There has also been an increase in obesity and overweight observed in school aged children in many countries (Nader *et al.*, 2006), including the United States where Singh *et al.*, (2008) reported that, in 2007, 16.4% of children aged 10-17 years were obese and 31.6% were overweight, representing a 10% increase in the prevalence of obesity amongst American children from 2003 to 2007.

Ireland is no different to this trend with the National Children's Food Survey (Irish Universities Nutrition Alliance, 2005) reporting a 2-fold increase in overweight in school age boys, and a 3-fold increase in obesity in school age girls, since the Irish National Nutrition Survey of 1990 (Irish Nutrition and Dietetic Institute, 1990). The Growing Up in Ireland study recently reported that 19% of Irish 9 year old children were overweight and 7% were obese, with girls more likely than boys to be defined as such. A relationship between a child's weight and their social class was also reported, with 22% of children from semi-skilled / unskilled backgrounds versus 18% of children from professional / managerial families noted to be overweight. Obesity levels were also linked to this, with 11% shown to be obese in the semi skilled / unskilled category

compared to just 4% in the professional / managerial group (Growing Up in Ireland, 2009a). In 2010, another study in Ireland reported that 14% of Irish 7 year olds were classified as overweight and 4% were classed as obese, with girls (23%) again more likely to be overweight or obese than boys (15%) (Irish Department of Children and Youth Affairs, 2012). While more recently the National Pre-school Nutrition Survey (Irish Universities Nutrition Alliance, 2012) ascertained that 23% of the population studied were defined as overweight or obese using the United Kingdom-World Health Organisation's criteria, with higher levels in the younger age groups; 27% aged 2 years and 32% aged 3 years.

The report of the National Taskforce of Obesity (Department of Health and Children (Ireland), 2005) notes that excess body weight is now the most common childhood disease in Europe, with some countries having as many as one in three children overweight or obese. One of its many recommendations is that the Health Service Executive, in implementing the Childcare Regulations 1996 and (Amendment) Regulations 1997, (Department of Health and Children (Ireland), 1998) should ensure that pre-school services support healthy eating and healthy living.

#### ***2.3.4.2 The costs associated with overweight and obesity***

A recent study which investigated the cost of overweight and obesity in Ireland found that, in 2009, the estimated direct and indirect cost of overweight and obesity was €1.3 billion, with 35% of costs being attributed to direct healthcare costs and 65% being indirect costs (*safefood*, 2012). A review (Summerbell, 2007) which carried out an economic evaluation of the cost effectiveness of obesity treatment and prevention interventions found that cost effective interventions do exist, with some leading to cost savings. The researchers, however, also noted that it was impossible to compare the

cost effectiveness of treatment and prevention interventions, or to determine the most cost effective time to intervene. Many methodological difficulties in determining cost effectiveness were outlined and more research in this area was encouraged. With the complexity in determining cost effectiveness of treatment and prevention, and the added problems related to recognising potential risk of obesity development amongst children, it has been suggested that the most cost effective interventions may be those that focus on the promotion of healthy eating and physical activity, assisting all children, and not just those at greatest risk of the development of obesity (Ells *et al.*, 2005).

#### ***2.3.4.3 Caregiver feeding practices and overweight and obesity***

Parental recognition of overweight in children is poor and this is no different in the pre-school aged child (Harnack *et al.*, 2009; Garrett-Wright, 2011), with 54% of parents with overweight children and 20% of parents with obese children reporting that their children were ‘about the right’ weight for their height (Growing Up in Ireland, 2009b). Interestingly, in tandem with this phenomenon, a number of parents (2%) of overweight or obese children believed that their children were underweight. This type of perception means that parents are less likely to engage in obesity prevention efforts with their children (Harnack *et al.*, 2009; Garrett-Wright, 2011).

Although inappropriate nutrition and lack of physical activity increases the risk of overweight and obesity in young children, the sustained increase in these conditions in the last 20 years is also being linked to transgenerational obesity programming, whereby obese mothers, or mothers who gain excessive weight during pregnancy, predispose their children to overweight. Once this phenomenon is established the increased risk of obesity development then grows from generation to generation (EarlyNutrition, 2013). In Ireland, results of the Lifeways Cross-Generation Cohort

study which aims to examine parent and child diet linkage and familial aggregation across generations demonstrated an obesity link across three generations, the strongest association in BMI being on the maternal side (Murrin *et al.*, 2012).

A relationship would appear to exist between the characteristics of parents and feeding practice in children; with both parental weight and a low level of parent education positively associated with overweight in children (Jingxiong *et al.*, 2009; Kalinowski *et al.*, 2011). In addition to the influence of parental body mass index, an examination of members of the 1958 British birth cohort ( $n$  8552) and their children ( $n$  1889) also found that full time maternal employment was associated with an increase in children's body mass index, and that this association had become stronger across the generations studied (Pinot de Moira *et al.*, 2010). A recent Irish study of 1124 mothers in the Lifeways Cross-Generation Cohort Study demonstrated that mother-child dietary correlations were stronger than those of a father and child, with the authors suggesting that the maternal environment may programme young children's diet behaviour (Shrivastava *et al.*, 2013)

A longitudinal study of 8,000 children in the United States collected data at four time points, from when children entered kindergarten until their third grade, by directly weighing and measuring children and by speaking with parents either in person or by telephone. The authors found that children who watched more television and ate fewer family meals were more likely to be overweight in 3<sup>rd</sup> Grade, while those children who watched more television, ate fewer family meals and had less safe access to outdoor play areas were most likely to continue to be overweight over four time points, measured from kindergarten to third grade (Gable *et al.*, 2007).

With many children now in care outside the home environment, a recent study in Canada investigated the predictive association between preschool care and overweight



and obesity in childhood and determined that compared with parental care, those children who had been in preschool care were more likely to be overweight or obese at the age of 4-10 years, with a significant association found between the number of hours spent in preschool care and the prevalence of overweight and obesity in childhood; each extra 5 hours increased the chances of overweight or obesity by 9% in the first ten years of life (Geoffroy *et al.*, 2013).

### **2.3.5 Calcium, vitamin D and bone health**

Strong bone development begins in infancy and continues into early adulthood. In the United States, osteoporosis prevention is being prioritised over its management by some key government groups, such as the Office on Women's Health, with prevention measures focusing on the youngest members of society (Benjamin, 2010). It is thought that strategies to educate the population on increasing calcium intake should be tailored to specific age groups and that limiting soft drinks and making dairy foods, including milk, readily available may be useful in increasing calcium consumption (Miller *et al.*, 2001).

In the recent Irish National Pre-school Nutrition Survey (Irish Universities Nutrition Alliance, 2012), researchers found that milk was considered a staple for this age group, with most consuming milk as a beverage or with breakfast cereal. Whole cow's milk was consumed most often; however, milk consumption decreased with age (88% at 1 year to 78% at age 4). Infant and 'growing-up milk' consumption was significant in children aged 1-2 years (31% and 18% respectively). While cheese was consumed by 64% of 1 year olds, consumption decreased somewhat by the age of 4 years (59%). Yoghurt consumption, however, increased with age; 54% of 1 year olds and 66% of 4 year olds consumed yoghurt.

While the main source of vitamin D is from exposure to sunlight and much controversy persists regarding recommendations for adequate vitamin D (McLaren *et al.*, 1993), more recently, much concern has been raised about vitamin D status in young children. Vitamin D concentrations are determined by serum concentrations of 25-(OH)D (Garza-Gisholt *et al.*, 2012). In children and adolescents vitamin D concentrations are defined as either: normal 25-(OH)D  $\geq$  20 ng/mL (50 nmol/L); insufficient 25-(OH)D 15-20 ng/mL (37.5 – 50 nmol/L); or deficient 25- (OH)D  $\leq$  15 ng/mL (37.5 nmol/L) (Misra *et al.*, 2008). In the United States, a cross sectional study examining the prevalence of vitamin D deficiency amongst 365 12-24 month old children found 12.1% were deficient in vitamin D ( $\leq$  20 ng/mL) while 40% were below the accepted optimal threshold of 30 ng/mL (Gordon *et al.*, 2008).

In Ireland, the most recent research on intakes of vitamin D amongst pre-school age children would suggest that a significant number of Irish children are at risk of vitamin D deficiency (Irish Universities Nutrition Alliance, 2012) which in turn has an impact on calcium absorption and bone formation (McLaren *et al.*, 1993).

## **2.4 Best practice in the childcare setting**

### **2.4.1 Introduction**

*'Toddlers and pre-school children require a physical and social environment that supports their physical growth as well as their emotional, intellectual and motor skill development'* (Dwyer, 1993). It has been noted that the child care setting has the potential to be a successful vehicle for health promotion (Gupta *et al.*, 2005) and obesity prevention (Story *et al.*, 2006; Kaphingst & Story, 2009).

Many parents are now relying ‘*on child care providers to share parents’ traditional role of ‘gatekeeper’ on their children’s nutrient intake*’ (American Dietetic Association, 2005). The education of children, in full day care, in the development of healthy eating patterns, is becoming predominantly that of the childcare provider, ‘providers’ being defined as ‘*all early learning and care professionals*’ that are involved with the care of children (Lanigan, 2012). Parents play a valuable role and have a powerful influence on their children’s eating habits by serving as a model in choosing foods, determining food availability, planning meals, and in the socialisation involved in eating (American Dietetic Association, 2005). It is recommended that parents are involved in all areas of their child’s childcare programme, including the planning of their meals, evidence, however, would suggest that this is not happening (Padget & Briley, 2005).

Kaphingst & Story (2009) noted that ‘*in contrast to the extensive research policy, and advocacy efforts regarding nutrition and physical activity in the school setting, the child care setting has been largely overlooked in the childhood obesity discussion*’. Flynn *et al.*, (2006), in reviewing best practice in reducing obesity and related chronic disease in children and young people, noted that there are few interventions in the pre-school setting and recommended that funding should be directed to develop prevention programmes in this setting. In fact, this dearth of research and interest in this setting is evident in the literature with, to date, little published research in the area from Europe, the United Kingdom and Ireland. The vast majority of research relating to childcare and health related practice has been in the United States, comprising of practice evaluations and interventions. With a small number of similar studies emanating from Australia, it is only in the very recent past that any publications have emerged regarding practice in the United Kingdom and Europe, with to our

knowledge no evidence of nutrition and health related practice intervention research in this area to date.

Comprehensive best health related practice guidelines for the childcare setting have been available in the United States for many years (American Academy of Pediatrics & American Public Health Association, 2002), with benchmarks specifically for nutrition in the childcare setting published by the American Dietetic Association (American Dietetic Association, 2005; American Dietetic Association, 2011) and physical activity guidelines for this age group also developed in the United States by the National Association for Sport and Physical Education (National Association for Sport and Physical Education, 2002). However, it is only recently that a set of guidelines were published for the United Kingdom (School Food Trust, 2012) following a review of the need for such guidance in the setting (Sharp *et al.*, 2010) and the development of guidelines in Northern Ireland (Health Promotion Agency for Northern Ireland, 2005), Scotland (Scottish Executive, 2006) and Wales (Welsh Assembly Government, 2009). The guidelines developed for Ireland, however, were published in 2004 (Department of Health and Children (Ireland), 2004) and have not been updated since this time.

While guidelines are available in a number of jurisdictions regarding the promotion of best nutrition and health practice for the early years setting (American Academy of Pediatrics & American Public Health Association, 2002; Department of Health and Children (Ireland), 2004; Government of South Australia, 2005; Health Promotion Agency for Northern Ireland, 2005; Scottish Executive, 2006; Welsh Assembly Government, 2009; School Food Trust, 2012), it is of concern that regulations for the pre-school setting, where they exist, are set to ensure minimum standards only. Advocates for quality in the pre-school setting have expressed anxiety that there is a danger that some will view these minimum standard regulations as

equivalent to quality and aim to provide a minimum standard service only for children in their care (Horgan, 2001). Added to this is the concern stemming from recent reviews of childcare regulations in the United States which noted that many states do not in fact have strong regulations governing healthy eating and physical activity in these settings (Benjamin *et al.*, 2009a; Benjamin *et al.*, 2009b; Kaphingst & Story, 2009).

In Ireland, (Department of Health and Children (Ireland), 2006), as in the United States (Ammerman *et al.*, 2007), it would appear that regulations concentrate on safety in the child care facility, with less focus being placed on nutrition and the food service environment. This is somewhat surprising when one considers that the nutrition environment plays a ‘critical’ role in the food habit development of the pre-school age child (Briley & McAllaster, 2011). As a large number of mothers now work, *‘all child care, regardless of setting, should be of high quality in order to maximize developmental outcomes during these early years’* (Rosenthal *et al.*, 2009). In fact, in the United States, the American Academy of Pediatrics & American Public Health Association (2002) recommends that *‘the caregiver / facility has a responsibility to follow feeding practices that promote optimum nutrition that supports growth and development in infants, toddlers and children. Child care providers / facilities who fail to follow best feeding practices even when parents wish such counter practices to be followed negate their basic responsibility of protecting a child’s health, social and emotional well being’*.

The main factors reported to affect nutrition in the child care setting are: existence of policy on nutrition education, nutrition service and nutrition resources; nutrition curriculum, food availability; physical activity as part of the curriculum;

knowledge, attitude and practices of staff; and the role and involvement of parents regarding nutrition issues (Montague, 2002).

#### **2.4.2 Policy**

Written policies are important to set out clear expectations for the role of the childcare staff and can be used to hold childcare services to account for their practices (Falbe *et al.*, 2011). Written policy may also play a role in chronic disease prevention by facilitating the implementation of healthy nutrition and physical activity practices and habits for children in the childcare setting (Story *et al.*, 2008).

Development of a food policy in the pre-school setting allows the manager, staff, parents, carers and children to understand the approach to food provision, teaching and learning about food; it allows consistent messages to be provided (School Food Trust, 2012). A group should be developed to draft policy, and parents and staff should be included in this group to facilitate discussions on the policy developed; this group should include the manager / director or nominee, pre-school teachers and support staff, food service / canteen staff, students, parents, management committee representation (as appropriate), local health service nominee (as appropriate) (Government of South Australia, 2005). If a diverse group comes together to decide on the policy content, '*the process itself helps to build consensus and support for the schools' health programme activities*' (United Nations Educational Scientific and Cultural Organization, 2004). Policy drafts should be shared with parents, and staff should be willing to work within the policy guidelines. Policy should be regularly reviewed (at least once per year) and if items outlined in the policy are not being adhered to, these should be addressed. All existing and new parents and staff should get a copy of the policy and it should also be

posted in a visible location (Department of Health and Children (Ireland), 2004; School Food Trust, 2012).

Little appears to be known about the health and wellness policies that childcare services have in place (Falbe *et al.*, 2011) with no legal requirement for such policies in the childcare setting in the United States. In their study of 221 childcare centres in Connecticut, Falbe *et al.*, (2011) assessed 94 separate policies using the data measurement tool specifically developed for the study. It was found that policies were present in many different formats such as parent handbooks, staff handbooks, parent notices, and ‘other’ documents. Studies elsewhere in the United States have shown a link between practice in childcare centres and the presence of health policies. A study undertaken in 50 American child care centres, that collected data over a 4 day period, observed staff modelling healthy behaviours at mealtimes in 80% of the centres visited, and although no substantial association was noted between the behaviours of staff and childcare centre policies, modelling behaviours were observed more frequently in centres that had written policies encouraging such behaviours (Erinosho *et al.*, 2012). In a separate questionnaire based study, children reported higher fruit consumption in pre-schools where a food policy was in place, while children in the study whose policy allowed the consumption of sugared milk drinks lowered milk consumption and an increased intake of sugared milk drinks (Vereecken *et al.*, 2008). A further study directly observed that fewer than 60% of childcare centres studied (total sample *n* 96) in North Carolina had written policies on physical activity, with the majority having vague statements on undertaking play or going outdoors with no specific details on the amount of time for outdoor or indoor playtime (McWilliams *et al.*, 2009).

It would appear that the presence of health related policy in childcare facilities is limited in the United Kingdom and in Ireland. In a small study of six child care centres

in the United Kingdom, which combined observation visits with semi-structured interviews, only one centre was found to have developed an healthy eating policy (Lloyd-Williams *et al.*, 2011). A telephone and face to face quantitative study of child care centres in Liverpool ( $n$  86) noted a poor prevalence of food policies in these settings; in association with this finding, the authors reported that the cooks working in these settings lacked the skills and knowledge to cook for children under 5 years of age; high salt processed foods were being provided to children, while provision of foods containing essential fatty acids, such as oily fish was below that recommended (Parker *et al.*, 2011). In Ireland, in a telephone survey of fifty four pre-school managers, 34 reported having a healthy eating policy; however, only 11 noted parent involvement and 14 noted staff involvement in the development of their policy. The serving of biscuits as snacks was significantly higher in those pre-schools which served snacks and had no healthy eating policy ( $P=0.034$ ). Where parents provided snacks, it was reported that the presence of an healthy eating policy was significantly associated with provision of advice to parents on appropriate healthy snacks ( $P=0.047$ ) (Jennings *et al.*, 2011). While it would appear that Irish pre-schools have better provision of healthy eating policies than pre-schools in the United Kingdom, this may be due to the self reported nature of these data.

### **2.4.3 Service and resources**

#### ***2.4.3.1 Education materials***

*'Pre-school can provide an opportunity to learn about food, where it comes from, how it grows, general good health and food cultures. Learning how to choose and enjoy*



*many different nutritious foods in early childhood can provide the foundation for a lifetime of healthy food choices*' (Department of Health and Children (Ireland), 2004).

Learning about food should be integrated into the curriculum of the pre-school; the learning can include: *personal, social and emotional development*, i.e. food tasting opportunities, cooking activities, opportunities to learn to work with others and heighten self esteem; *physical development* i.e. the learning of fine and gross motor skills through using knives and forks at mealtimes, preparing foods, gardening; *literacy*, i.e. development of language and exploration of senses when discussing taste, texture, look and smell; *mathematics* for example counting cutlery when setting the table; *communication and language*, i.e. sitting with staff and teaching conversation at mealtimes; *understanding the world*, i.e. tasting food from different cultures and growing food and explaining where it comes from; *expressive arts and design*, i.e. engaging children in art activities with food and highlighting colours and shapes (School Food Trust, 2012).

In the United States, the Contra Costa Child Care Council Child Health Nutrition Program, recommends that '*nutrition and physical activity are taught as specific learning objectives and woven into activities throughout the day*'; examples of this include: reading books to children either before or after meals and snacks that are related to food, eating and physical activity; planning activities and games that increase knowledge and acceptance of foods and physical activity; getting children involved in planning and preparing food; using television, computers and videos as education tools to promote food and physical activity; restricting television watching unless it is to do with the education plan; ensuring adults join in with children in physical activity (Contra Costa Child Care Council, 2006).

The provision of dining facilities that are comfortable and supportive of healthy eating is also an important objective for pre-schools; the provision of colourful pictures of different foods at child height level and the hanging of Food Pyramid posters in the dining environment is part of best practice in American Head Start pre-schools whose aim is to engage young children in the pleasant and social nature of meal and snack times (Gable & Lutz, 2001).

#### **2.4.3.2 Physical activity time**

*'There is a relative lack of research that examines physical activity in the pre-school population. Although this age group was once thought to be extremely active, research suggests that, overall, many activities in which pre-schoolers engage are actually sedentary in nature'* (Hodges *et al.*, 2013). Physical activity includes all types of activity: walking, active play and participating in games that are active. Young children who participate in regular physical activity get immediate and long-term health benefits (School Food Trust, 2012). Physical activity helps children to build muscle strength, but also helps in the development of vital physical skills of balance, co-ordination and climbing (Health Promotion Agency for Northern Ireland, 2005). It is recognised that *'active children have a better appetite. A child that is inactive and has a poor appetite may not get all the nutrients he or she needs in a small amount of food'* (Department of Health and Children (Ireland), 2004), and that *'physical activity plays a vital role in a child's development. It builds a young child's confidence, promotes bone and muscle development and increases the likelihood of maintaining a long term healthy weight'* (Department of Health (Ireland) & Health Service Executive, 2011).

The promotion of physical activity through the development of motor skills is very important during the pre-school years. Paediatricians and other health care professionals have a role in highlighting to parents and caregivers the importance of nurturing these skills through unstructured and structured play (Riethmuller *et al.*, 2009). In 2002, the National Association for Sport and Physical Education (National Association for Sport and Physical Education, 2002) developed the first set of guidelines for physical activity in pre-school aged children (**Table 2.5**); however, no specific recommendations for the child-care setting existed until a set of guidelines specifically for this setting were developed as part of the Nutrition and Physical Activity Self Assessment for Child Care (NAPSACC) project (McWilliams *et al.*, 2009). These guidelines were collated from a number of different organisations, the exception being when no recommendations were present; then a best practice guideline was developed through research evidence and expert opinion. In Ireland, the National Association for Sport and Physical Education guidelines have been adopted for use in the childcare setting (Department of Health (Ireland) & Health Service Executive, 2011).

**Table 2.5 Active Start – physical activity guidelines for children - birth to five years** (United States’ National Association for Sport and Physical Education, 2002)

<b>Infants</b> <i>(birth to 12 months)</i>	<b>Toddlers</b> <i>(12-36months):</i>	<b>Pre-schoolers</b> <i>(3-5 years)</i>
1. Infants should interact with caregivers in daily physical activities that are dedicated to promoting the exploration of their environment.	1. Toddlers should accumulate at least 30 minutes daily of structured physical activity.	1. Should accumulate at least 60 minutes daily of structured physical activity.
2. Infants should be placed in safe settings that facilitate physical activity and do not restrict movement for prolonged periods of time.	2. Toddlers should engage in at least 60 minutes and up to several hours per day of unstructured physical activity and should not be sedentary for more than 60 minutes at a time except when sleeping.	2. Should engage in at least 60 minutes and up to several hours per day of unstructured physical activity and should not be sedentary for more than 60 minutes at a time except when sleeping.
3. Infants’ physical activity should promote the development of movement skills.	3. Toddlers should develop movement skills that are building blocks for more complex movement tasks.	3. Should develop competence in movement skills that are building blocks for more complex movement tasks.
4. Infants should have an environment that meets or exceeds recommended safety standards for performing large muscle activities.	4. Toddlers should have indoor and outdoor areas that meet or exceed recommended safety standards for performing large muscle activities.	4. Should have indoor and outdoor areas that meet or exceed recommended safety standards for performing large muscle activities.
5. Individuals responsible for the well-being of infants should be aware of the importance of physical activity and facilitate the child’s movement skills.	5. Individuals responsible for the well-being of toddlers should be aware of the importance of physical activity and facilitate the child’s movement skills.	5. Individuals responsible for the well-being of pre-schoolers should be aware of the importance of physical activity and facilitate the child’s movement skills.

\* the guidance presented supports the National Association for Sport and Physical Education (NASPE)’s position that all children from 0-5 years ‘*should engage in daily physical activity that promotes health related fitness and movement skills*’.

A number of interventions have taken place to promote physical activity specifically in the pre-school setting. The ‘*Hip-Hop to Health Junior*’ was a

randomised control trial introduced to prevent obesity in 3-5 year old children attending Head Start pre-schools in the United States providing care for mainly African American children. The intervention group received three 40 minute sessions (20 minutes information on healthy eating and physical activity and 20 minutes aerobic activity) per week for 14 weeks, while parents received weekly newsletters, weekly homework assignments and aerobic exercise sessions twice a week; the control group received a 20 minute general health education session once per week for 14 weeks while their parents received weekly newsletters. Children in the intervention group were observed to demonstrate a lower increase in body mass index at one and two year follow-up time points than those in the control group (Fitzgibbon *et al.*, 2005). In another study of 96 Head Start pre-school children and their parents, a higher prevalence of obesity was noted amongst these children when their measures were compared to the national average. Parents reported play levels did not meet recommended guidelines regardless of the body mass index of the child; further, it was found that children who were less physically active were more likely to eat snacks (Hudson *et al.*, 2009). Another study of 281 children attending nine pre-schools in the United States determined through direct measurement that levels of physical activity amongst the children were very variable, with the pre-school attended and its physical activity policy being a highly significant determinant of vigorous and moderate physical activity (Pate *et al.*, 2004). A further study of 299 children from 20 pre-schools determined through direct observer based assessment that children spent more time being physically active in pre-schools that had: high quality scores; less fixed and more portable play equipment; less use of electronic media devices; and larger playground areas as measured using the Early Childhood Environment Rating Scale; with those in the five pre-schools that had all of the characteristics accumulating significantly more moderate to vigorous physical

activity in a sixty minute period (Dowda *et al.*, 2009). This added support to another study in 20 pre-schools in which the physical activity environment was directly measured using the Environment and Policy Assessment and Observation tool and the proportion of time children spent engaging in physical activity was measured using a second tool the Observation System for Recording Activity in Pre-schools (OSRAP). Through this study, it was determined that in pre-schools with the highest physical activity environment score, children were more physically active (Bower *et al.*, 2008). However, in contrast, a study in the Netherlands found that provision of playground markings or play equipment in the pre-school setting was insufficient to increase physical activity amongst pre-school children measured by directly observing playground equipment and measuring physical activity with accelerometers (Cardon *et al.*, 2009).

#### ***2.4.3.3 Sedentary behaviour***

Sedentary behaviour is now seen as separate from physical activity and is not viewed as merely an absence of physical activity (Reilly, 2008). In an effort to limit sedentary activities, the American Academy of Pediatrics recommends that infants and toddlers less than 2 years of age should not watch any television, and screen time should be limited to less than two hours per day for those aged 4-6 years (American Academy of Pediatrics, 2006).

A telephone survey in the United States determined that children in 70% of 'home based' and 36% of 'pre-school centre based' child care services watched television daily; with the average time spent watching television being 2 to 3 hours for 'home based' and 1.5 hours for 'pre-school centre based' child care services (Christakis & Garrison, 2009). In an observation based study by McWilliams *et al.*, (2009), it was

noted that while televisions were visible in less than half of all pre-school rooms, television was watched in nearly all (89%) of the pre-school sample, with television being watched for between 31 and 60 minutes in 17% of centres and for more than 60 minutes in 9% of centres. A randomised, controlled trial in the United States, which aimed to introduce an intervention to reduce the amount of time children spent watching television, targeted 16 pre-school services catering for 3-5 year old children. The intervention group received seven interactive education sessions, 20 minutes in duration, over a 3 month period. After six months, the intervention group watched television for less time than the children in the control group with fewer children watching in excess of 2 hours per day (Dennison *et al.*, 2004).

#### ***2.4.3.4 Outdoor time***

Outdoor play provides many chances for the young child to learn about their environment and '*playing outside in summer sunshine helps children to get vitamin D for healthy bones and teeth*' (Department of Health and Children (Ireland), 2004). Outdoor time has been significantly correlated with physical activity in pre-school children (Burdette *et al.*, 2004) with time spent in the outdoors being one of the most consistent predictors of physical activity levels amongst this group (Sallis *et al.*, 2000).

The American Dietetic Association (2011) recommends that childcare providers should facilitate outdoor time '*at least once per day and preferably more often*' and the Health Promotion Agency of Northern Ireland recommends that childcare staff should '*ensure that children have access to outdoor play every day*' (Health Promotion Agency for Northern Ireland, 2005). However, a quantitative questionnaire based survey of American childcare centre managers revealed that over 50% of toddlers in childcare centres in the United States were reported to have less than 60 minutes per day of

outdoor time, although almost all reported having outdoor play areas and that their staff engaged with the children in their physical activity sessions (Tandon *et al.*, 2012).

A qualitative study of 49 pre-school providers in nine focus groups in the United States identified two unexpected themes when determining the reasons that physical activity levels may vary between childcare centres. Providers cited that children's clothing was a large barrier to physical activity and that children's clothing was a source of conflict between providers and parents (Copeland *et al.*, 2009). Lack of hats, gloves and coats in cold weather; the wearing of sandals or flip flops in warm weather; parents dressing children in 'fancy' clothes and requesting that they refrain from getting dirty; wearing jewellery or ill fitting clothing, were all issues highlighted by pre-school providers. Car culture, affordability of outdoor clothing; not wanting their child to go outside; being a first time parent; or lack of awareness of the importance of outdoor play, were all reasons proposed by providers for poor clothing provision by parents. Staff cited the development of a good rapport with parents, in which the importance of outdoor play could be discussed, was the best way to encourage parents to provide appropriate outdoor clothing. Lack of adequate clothing was reported to limit the outdoor play of a whole class even if only one or two children did not have clothes, as the teacher could not leave behind a child while bringing others outside.

In a scientific paper (Copeland *et al.*, 2012) which presented additional findings from the same study, three further barriers to children's physical activity in the childcare setting were identified: injury concerns; financial worries and a focus on prioritising academic learning. Financial constraints within a childcare service meant less money was spent on outdoor or physical activity equipment with emphasis instead on less expensive indoor activities. Safety worries have led to parental requests to prevent children partaking in physical activity and have resulted in playgrounds being modified



to reduce the risk of childhood injury; which, the authors suggest, results in less interesting or motivating environments for children. Several childcare workers commented that parents wanted to know what had been learned throughout the day, but were not interested in whether their child had been outdoors or had been active; participants in the study felt that they had to justify outdoor activity to parents by relating it to learning in the playground (Copeland *et al.*, 2012).

The type of outdoor play policy existing in a pre-school will impact on children's opportunity for outdoor play in inclement weather; in a study of 162 pre-schools in Ohio, only 20% of services reported that children were allowed to go outside at less than zero degree temperatures and only 43% reported that children were allowed outside in light rainy conditions (Copeland *et al.*, 2011).

There has been a call for more research into parents' and childcare workers' attitude to the influence of weather on outdoor play. There would appear to be an hypothesis that children will get sick if exposed to outdoor conditions. Copeland *et al.*, (2011) recommend that to change attitude, childcare physicians should discuss with parents the importance of: *'(1) outdoor play for healthy growth and development, (2) dressing children appropriately for play, and (3) working with childcare centre staff to ensure that children are given adequate opportunities for physical activity'*.

A qualitative study of middle class children in the United Kingdom (*n* 53) and their mothers (*n* 8) determined that while children preferred and hoped for adventurous outdoor activities, their mothers felt more comfortable bringing their children to safe, easy to use sites. It was also found that mothers lacked the confidence to explore the countryside outside of 'safe sites' (Pearlman Hougie, 2010).

#### ***2.4.3.5 Use of food as a reward or treat***

The American Academy of Pediatrics & American Health Association (2002) recommended that *'caregivers shall encourage, but not force, children to eat. Caregivers shall not use food as a reward or punishment'* noting that offering food as a reward or withholding it as punishment may have a negative effect on a child's relationship with food. While food is often part of celebration, guidelines recommend that because there may be so many events and celebrations in large childcare settings that other ways of marking occasions should be used (Health Promotion Agency for Northern Ireland, 2005) i.e. praising; providing stars and stickers; wearing a crown; party games or face painting rather than the more traditional 'sweets, crisps and fizzy drinks' (Department of Health and Children (Ireland), 2004).

*'Expressing affection and rewarding good behaviour on the part of the child by verbal praise and non-food treats are preferable to constant rewards with candy or sweets'* (Dwyer, 1993). While Henderlong & Lepper (2002) suggest that *'adults rely on praise both to influence children's behaviour and to express approval'*; the effects of praise on children's self motivation are complex and diverse ranging from *'beneficial to negligible to detrimental'*; for this reason it is important that those giving praise to children understand its motivational consequences. The authors noted that if praise is sincere it is likely to *'enhance intrinsic motivation when attributional messages prevent maladaptive inferences, when autonomy is promoted, when perceived competence and self-efficacy are heightened without undue use of social comparison, and when realistic standards and expectations are conveyed'*, but that the effect of praise on motivation may vary depending on the recipient characteristics; age, gender and culture. It was suggested, however, that repeated tasting of non-liked foods in combination with provision of non-food rewards or praise were effective at increasing both the liking, and

intake, of food immediately, and at 3 month follow-up, while repeated tasting alone increased immediate intake and liking, but liking was not maintained at 3 months (Cooke *et al.*, 2011).

In the United States, a mail based questionnaire survey reported that many schools, districts and states have introduced policies to inhibit the use of food as a reward in classrooms (Turner *et al.*, 2012); with one survey of 2,069 schools indicating that approximately 40% of schools contacted did not allow food based rewards in the period 2009-2010. However, in contrast, in a recent telephone survey of reported nutrition related practice in 54 full day care pre-schools in Ireland, one quarter of pre-school managers said that they used food as a reward (*n* 14) (Jennings *et al.*, 2011).

#### ***2.4.3.6 Age appropriate equipment and eating and drinking utensils***

There are a number of different recommendations regarding the provision of age appropriate eating and drinking utensils and other dining equipment, with the standards in the United States being extremely comprehensive in outlining best practice in this area (American Academy of Pediatrics & American Public Health Association, 2002). Examples of best practice from these standards include: food should be served to young children from a dish and *'not directly from a factory sealed container'*; children who do not require highchairs should be *'comfortably seated at tables that are between waist and mid-chest level and allow the child's feet to rest on a firm surface while seated'*; *'Eating utensils should be suitable in function, size and shape for use by children'*; *'food should not be put directly on the table surface, as even when washed and disinfected table surfaces will never be as clean as a washed plate and when children eat from a plate they learn to place uneaten food on the plate rather than the table surface between bites so reducing the contamination of the table surface. Food should*

*not be placed directly on to the surface of a highchair either'* (American Academy of Pediatrics & American Public Health Association, 2002).

Other recommendations in this regard are that children should be introduced to an unlidded cup from 6 months of age (Health Service Executive, 2005; Irish Nutrition and Dietetic Institute, 2012) and that by 12 months of age, an infant should drink from a cup rather than a feeding bottle (Department of Health and Children (Ireland), 2004; Food Safety Authority of Ireland, 2012a). There are a number of reasons why this is recommended, including the prevention of dental caries risk that may be associated with long term bottle use, and the need to move from the sucking reflex associated with bottle feeding to the swallow reflex that is necessary for speech and language development (Health Service Executive, 2005; Irish Nutrition and Dietetic Institute, 2012). Learning to sip compared to sucking drinks is also better for children's teeth (School Food Trust, 2012). In a study of 1026 randomly chosen children participating in the Avon Longitudinal Study of Parents and Children (ALSPAC) study, parents were requested to record all drinks their children consumed in a 24 hour period; reporting that 64% of the children received fluids in a bottle at the age of 18 months. The authors noted that bottle feeding with cows' milk can lead to excessive intake which may be associated with: overweight if its intake is in addition to an already adequate diet; or displacement of other dietary foods, potentially causing a detrimental effect on iron status. In fact, the authors found that those in the study who only consumed fluids from a bottle had a significantly lower mean level of iron intake (4.97 mg) than those who only used a cup (5.38 mg;  $P=0.035$ ) (Northstone *et al.*, 2002).

## **2.4.4 The pre-school curriculum**

### ***2.4.4.1 Education frameworks***

It is acknowledged that nutrition education is a key constituent of lifelong healthy eating and should start from the early stages of life (Pérez-Rodrigo & Aranceta, 2001). Dwyer (1993) suggested that *'pre-school programmes should include nutrition education components that expose the child to new eating experiences in a supervised and safe environment, and also include involvement in preparation and clean-up'*, while Lanigan (2011) outlined the important role that caregivers play in the shaping of childhood nutrition and activity practice: *'young children acquire their health knowledge through direct instruction, modelling and experiences from their environment. The contexts in which young children develop, primarily the family and, for a growing number of children, child care, influence both their understanding and decisions regarding eating and physical activity'*. Belfield (2007) suggested that *'with its diverse and sustained benefits for children, early education may have relatively powerful academic and developmental consequences such that it merits priority over other public investments'*.

#### *The framework for education in Ireland*

In Ireland, there are two frameworks relating to the development of early childhood care and education and both have a role in facilitating childcare practitioners to improve the quality of children's early experiences. In 2006, the Centre for Early Childhood Development and Education (CEDCE) developed Síolta, The National Quality Framework for Early Childhood Education on behalf of the Department of Education and Science. CEDCE was closed in 2008 leaving responsibility for implementation of Síolta with the Department of Education and Science. In 2009, the National Council for

Curriculum and Assessment (NCCA) published Aistear, the Early Childhood Curriculum Framework. The aims of both Frameworks differ somewhat, with the aim of Síolta being to ‘*enhance all elements of early years practice*’, while Aistear ‘*focuses exclusively on children’s early learning and development*’ (National Council for Curriculum and Assessment & Centre for Early Childhood Development and Education, 2009). In Ireland, early childhood practitioners have a diverse range of experience and qualifications ranging from unaccredited to post-graduate (National Council for Curriculum and Assessment & Centre for Early Childhood Development and Education, 2009).

#### ***2.4.4.2 Education of children***

##### *Teaching children about food*

While nutrition education during mealtimes has been advocated, research has shown that in practice this does not take place easily or frequently (Nahikian-Nelms, 1997; Gable & Lutz, 2001). ‘*It takes many people to provide young children with a safe and pleasant eating experience*’ (Benjamin, 2007). To ensure consistency, childcare providers should work closely as a team with cooks and food service staff and with parents. When teaching about food, and its relationship with health, childcare staff should introduce many new foods and food experiences to children; provide food learning experiences and encourage parents to mirror these experiences at home; encourage children to talk about their food experiences with parents when they go home. Child care providers should help children to learn about food by teaching food properties; food choices; new foods; different cultures and how to prepare food (Benjamin, 2007).

Teaching young children how to enjoy new foods is an important part of healthy habit formation in which child care providers and parents can play an extremely valuable role. A number of ideas have been suggested to parents and child care providers to encourage children to eat a variety of foods: having a positive attitude; not forcing children to eat; letting children prepare food; serving new foods when children are hungry; serving one new food at a time; being a good role model and respecting children's food preferences (Benjamin, 2007). Child care providers should teach children about the taste and smell of foods and provide opportunities for children to experience different food textures, colours and shapes; teaching should take place during meals and snacks and also through the curriculum and '*the pleasure of eating*' should never be disrupted by the learning experience (American Academy of Pediatrics & American Public Health Association, 2002). However, Lanigan (2011) observed that during a role play scenario, children were less likely to engage in evidence based food service practices and more likely to carry out activities that are not supportive of healthy weight development. Children were also found to be more likely to be able to identify healthy foods than to identify activities that make their bodies healthy; as a result, the authors called on childcare workers and parents to be more active in promoting healthy practice through modelling and teaching.

A qualitative study, using face to face in-depth interviews of 17 childcare providers in the United States, determined that providers believed that important aspects of their role included promoting speech, behaviour, learning and social skills and advising families; barriers described included their own skills' limitations and '*how they do and do not work cooperatively with parents*' (Rosenthal *et al.*, 2009).

A study which investigated the effectiveness of teacher modelling to encourage food acceptance amongst pre-school children observed that when teachers provided

enthusiastic modelling, rather than silent modelling, children were more likely to maintain their intake of new familiar foods. The authors also determined that enthusiastic modelling by teachers was not as beneficial in encouraging food acceptance as the use of trained peer models and suggested that when seating children and staff at mealtimes in the pre-school setting, it is important to be aware of these determinants (Hendy & Raudenbush, 2000). A follow up study observed that trained female peer models had a better effect on immediate food acceptance than their male equivalents but that this effect was not evident after one month (Hendy, 2002).

In Canada, the harnessing of peer education was investigated with the '*Healthy Buddies*' programme by enrolling older children as teachers of health promotion to younger children in kindergarten and the early years of primary school. The authors noted that in a pilot study of two schools (*n* 383 children), both older and younger children in the intervention arm (*n* 232) of the study reported improving their healthy living knowledge, healthy eating and physical activity behaviour and attitudes to health. This group also displayed a smaller rise in systolic blood pressure, body mass index and weight amongst older students, and a larger increase in height amongst younger students, when compared to the control group. A lower level of reported bullying was also observed in the intervention group (Stock *et al.*, 2007).

#### *Education of children in pre-schools in Ireland*

In Ireland, there would appear to be a discrepancy in how early education and early childcare are treated by government, with two schemes currently being provided. The first scheme, the 'Community Childcare Subvention Scheme' is a '*targeted subsidy scheme designed as a social inclusion measure that aims to benefit welfare recipients*'; the second scheme is the universal 'Free Pre-school Year in Early Childhood Care and



Education’ an *‘early education subsidy offering a limited number of free pre-school hours to all children’*. While both schemes purport to provide a ‘quality’ service, it would appear that the funding conditions and amount of investment are not equal for each.

In the ‘Free Pre-school Year in Early Childhood Care and Education’ scheme, adherence to quality frameworks is necessary, as is the provision of staff with minimum qualifications; increased per capita funding is available if staff members with higher qualifications are employed. However, the funding for the ‘Community Childcare Subvention Scheme’ is dependent only on adherence to statutory regulations such as child staff ratios and health and safety requirements; and while the services providing the scheme may have qualified staff in place, they may also employ a large number of non-qualified part time staff through the Community Employment Scheme due to a pressure to keep costs of the service low for parents (O’Donoghue Hynes & Hayes, 2011).

## **2.4.5 Food availability**

### ***2.4.5.1 Adequate number of meals and snacks***

*‘Making positive changes in the types of food available to children in schools has the potential to have a substantial impact on their dietary intakes and the prevalence of childhood obesity’* (Fox, 2010). Relatively little data are available on food service in the pre-school setting. A number of studies have questioned providers about the food they provide to children, while some studies have directly observed food served to, or eaten by, pre-school children.

Young children have high energy requirements, but only have small stomachs, therefore necessitating them to eat small amounts on a regular basis. For this reason, it is important that meals and snacks are timed well and there is no more than 3 hours between any meals and snacks (School Food Trust, 2012). There may, in practice, be some confusion regarding what is considered a ‘meal’ and what is classified as a ‘snack’; in the United States, it is stated that a ‘meal’ should be composed of ‘all four components’: dairy; fruit / vegetables; grains or bread; and meat or meat alternative, while a ‘snack’ should be made by selecting two of four of the aforementioned components (Benjamin, 2007).

The National Training Institute for Child Care Health Consultants in the United States recommends that food should be offered to children every 2-3 hours suggesting the serving of *‘breakfast at least 2½ hours before lunch and snacks at least 1½ hours before lunch or dinner’* (Benjamin, 2007). Children may need to be offered three meals (breakfast, lunch and tea) and two to three snacks in a day (School Food Trust, 2012) depending on the length of time they spend in pre-school care. Children in full day care, who are being cared for outside the home, for more than five hours, should be offered *‘at least two meals and two snacks – breakfast, snack, lunch and snack. One meal should be a hot meal. If children are there for a long day, an evening meal may also need to be provided’* (Department of Health and Children (Ireland), 2004). However, Jennings *et al.*, (2011) noted that thirteen of 54 Irish full day care pre-school managers reported, when questioned, that they failed to provide at least two meals and two snacks for children aged 1-5 years.

Several environmental and food cues influence people’s perception of food times, determining whether they perceive them as meals or snacks. The strongest reasons given for perceiving a food time to be a meal were: eating with family;

inclusion of ceramic plates and cloth napkins; and a food time lasting for 30 minutes. Quality food was also perceived to be more likely to be served at a meal than at a snack time (Wansink *et al.*, 2009). A study carried out amongst older adolescents and adults determined that how a person perceives a food time can determine how much, and what they eat at a sitting, and whether they decide to eat later on (Pliner & Zec, 2007).

Energy intake has been found to be positively related to number of eating occasions, meals and snacks, energy density of foods, number of foods consumed and portion or serving size (McConahy *et al.*, 2004; Mrdjenovic & Levitsky, 2005) with portion size on its own only accounting for a 17-19 % variance in energy intake. Many studies have explored the influence of parents, as primary caregivers, on their child's feeding habits and the role of the childcare provider mimics that of the parent in many instances. It is felt that parents may be programming '*their children to eat past their innate satiety cues*' (Orrell-Valente *et al.*, 2007). It is recommended that parents are given information that children are programmed to self regulate energy and to recognise and respond to hunger and satiety; external influences such as parental control can disrupt children's ability to self regulate; a parent's main role is to provide nutritious food and to decide when this is best served; children need to be given the freedom to choose which food to eat of those served, and how much they will eat; using food as a reward or threat attached certain value to these foods, i.e. desserts (Orrell-Valente *et al.*, 2007). In a further telephone based study, it was found that inappropriate feeding practices reported by parents immediately increased fruit and vegetable consumption but decreased children's liking of these foods (Bante *et al.*, 2008).

If food is provided from a child's home for the pre-school setting, the childcare provider should provide written guidelines for parents as to the nutritional requirements of children while in their care and information on how to achieve these requirements. If

food provided by parents is not sufficient, the childcare provider should supplement the child's food to ensure all requirements are met and, if food provision from home consistently does not meet nutritional requirements, a referral should be made to a health professional (American Academy of Pediatrics & American Public Health Association, 2002).

### *Menu provision*

In the United States, there are five 'Caring for Our Children' standards relating to menus in the child care setting: menus should be visible or made available to parents; menus must be dated; menus must reflect food served; menus must be planned in advance; menus must be kept on file (American Academy of Pediatrics & American Public Health Association, 2002). In the United Kingdom, the Caroline Walker Trust has provided comprehensive information for pre-schools on menu planning (Crawley, 2006); this has been supplemented more recently with guidelines included in the School Food Trust publication for the sector (School Food Trust, 2012). A menu resource was developed in Ireland (Irish Health Service Executive, 2004) to deliver practical guidance on menu development, as a follow-up to previously published Food and Nutrition Guidelines for Pre-school Services (Department of Health and Children (Ireland), 2004). The resource provides guidance on breakfast, lunch, dinner, tea and snack menus for pre-school children. Three weeks of recipes are included, with the suggestion that pre-schools should display the menus that they devise from these for staff, and provide copies of them for parents (Irish Health Service Executive, 2004).

In a study undertaken to compare the regulations in 50 states of America and the District of Columbia with the standards outlined, it was determined that state regulations for child-care facility menus varied greatly. Ten states (20%) had no

regulations relating to the menu standards; 13 states (25%) demonstrated regulations for four of the five standards and seven states had regulations for all five standards (Benjamin *et al.*, 2009a). A study which directly observed the types of foods served in an American Head Start child care centre and compared these to the centre's monthly menus, determined that of the 269 meals and snacks observed, only four actual meals matched those on the menus. When individual foods offered ( $n$  861) were compared to those listed on the menus ( $n$  895), only 74 foods matched (excluding milk). The authors noted that incorrect menus may prevent parents and childcare centres from working together to provide the best nutrition for children, acknowledging that although substitutions may be made, one would not expect a substitution of over 98% of meals (Fleischhacker *et al.*, 2006). While this study was limited to a single child-care centre, a subsequent study carried out by Benjamin Neelon *et al.*, (2010) compared menus to observational data collected on the food and beverages served during one full day in 84 child care centres in North Carolina. This study demonstrated that menus were accurate for only approximately half of all meals and snacks served, with the largest differences being observed in the juice, fruit, beverage and low nutritional value food such as cakes and cookies and further noted that a number of foods and beverages ( $n$  110) were served in the centres that were not included in the menus. The authors concluded that although direct observation, as a means of determining dietary quality in this setting, may be more costly, it may provide more accurate data on the quality and nutritional value of food served to children than reliance on menu data which may not be accurate, clear or sufficient.

In a telephone survey of Irish pre-school managers, while forty six of 54 reported having a menu, the type of reported menu varied from no cycle ( $n$  10) to 3 week cycle ( $n$  6) which is considered the optimum (Irish Health Service Executive,

2004), with many having other variations of 1, 2 and 4 week cycles (Jennings *et al.*, 2011).

### *Cost of food*

The effect of an economic recession on food choice has not been reported upon widely in the literature (Miller & Branscum, 2012). An American study of mothers' food shopping behaviour during recession, found that price was the most important factor in making a food purchase decision; that participants shopped at many locations to get the best price, perused advertisements for special offers, used coupons, waited for certain food to be 'on sale' and bought smaller amounts of food to reduce food costs (Miller & Branscum, 2012).

Food provision cost has been shown to impact on the type of food served in child care settings. In the United States, the Child and Adult Care Food Program provides monetary subsidies for food in child care centres participating in the programme. In a study of sixty childcare providers, it was found that those with higher reimbursements had greater menu expenditure, and significantly higher mean nutritional adequacy (Monsivais *et al.*, 2011). In the United Kingdom, Moore *et al.*, (2005), in a qualitative exploration of pre-school providers' views, determined that providers believed parents worried more about the cost of childcare than the quality of food provided to their children. Budgets were cited as a limiting factor to the nutritional adequacy of food served. Another study of childcare centres in Liverpool, which combined direct observation and semi-structured interviews with pre-school managers, found that where facilities were owned by one person and were for profit, the budget for food was restricted, leading to a detrimental effect on the quality of food provided and,

in most cases, this effect was manifested in the provision of more processed food (Lloyd-Williams *et al.*, 2011).

#### ***2.4.5.2 Meal portion / serving sizes***

Children tend not to eat the same quantity of food from day to day or from meal to meal (Health Promotion Agency for Northern Ireland, 2005) as their varying appetite and their food preferences also play a role. When caregivers do not comment on changes in the volume eaten by children and when there is no requirement to eat a certain portion of food; eating problems should not ensue. Children should be served '*small-sized portions*' and they should be allowed to have '*one or more additional servings as needed to meet the needs of the individual child*' (American Academy of Pediatrics & American Public Health Association, 2002).

*'Portions are how much of a given food an individual chooses to eat...portions may contain one or more recommended servings from the basic food groups... Servings are a simple way of assessing a person's diet and have been created by the United States Department of Agriculture to guide people regarding the recommended number of servings one should have in a day from each of the food groups as well as serving size'* (Bish *et al.*, 2005). The United States Department of Agriculture (1999) recommends that parents use familiar household measures to quantify foods for their pre-school age child.

The use of food photographs to estimate food portion size has been described as a suitable method for research as one or more portions can be photographed and photographs are easy to carry or post when carrying out fieldwork; a study in France noted that when volunteers were asked to use photographs to estimate food portion sizes, errors occurred but these were usually small (<10%) to moderate (10-25%)

(Lucas *et al.*, 1995). Amongst 6<sup>th</sup> grade children in the United States, the use of digital photography allowed researchers to directly determine the portion size of food taken in a school cafeteria and the effect of second servings on food intake. The study concluded that the availability of seconds was associated with increased amounts of food selection and food waste and that those who selected second servings ate significantly more than those who never selected seconds. The authors noted, however, that these results may not generalise to children of all ages and that the sample size used was small (Martin *et al.*, 2007).

A qualitative study of mothers' views on portions sizes served to children determined that they were not concerned about the portion sizes of food and were not interested in official guidance on food serving size. Mothers also reported serving food to their children in quantities they thought their children would eat (Crocker *et al.*, 2009). However, food item size reduction has been shown to lead to a decrease in energy intake when two portion sizes of equivalent foods are offered; in a study which focused on cookie size and its effect on calorie intake, even though a greater number of smaller sized cookies were eaten by children, those eating the larger cookies consumed a significantly larger weight of cookie and gained 68 kcal over the 'small cookie' group (Marchiori *et al.*, 2012). Rolls *et al.*, (2000) have found that age may be associated with food consumption patterns, observing that five year old children in childcare eat larger amounts when they were given bigger portions, while 3½ year old children's eating did not seem to be affected by the portion size with which they were provided.

A study by Fox *et al.*, (2006) of average portions of food eaten by infants and toddlers in the United States compared food portion intake data of children in the Feeding Infants and Toddlers (FITS) Study (*n* 3,022) to average portions reported in the United States' Continuing Survey of Food Intake for Individuals. It was found that the



average portions reported in the FITS study were consistent with the recommended portion sizes from the Child and Adult Care Food Program for formula, juice, meats and cheese; however, for cereal, bread, fruit and vegetables and milk (toddlers only) the average portions of infants and toddlers from the FITS study were consistently larger than Child and Adult Care Food Program portion sizes; this finding was similar to that of Padgett & Briley (2005) who noted that Child and Adult Care Food Program portion sizes were smaller than those recommended in the Food Pyramid guidelines. In Ireland, data from the Irish National Children's Survey (Irish Universities Nutrition Alliance, 2005) were used to explore the relationship between portion sizes of certain foods and the intake and quality of fat consumed by Irish children. Larger portions of bread, boiled potatoes, breakfast cereals, fruit and vegetables and sugary sweets were associated with lower intakes of total and saturated fat as a percentage of the total energy on the days these foods were consumed; while larger portions of eggs, milk, cheese and chocolate were associated with an higher percentage energy from fat (Lyons *et al.*, 2011).

A number of studies in the United States have explored the food and beverages served to children in the child care setting. A dietary observation based study of 117 children attending 20 child-care centres in North Carolina was conducted by Ball *et al.*, (2008). Food and beverages served and consumed by children were recorded and compared to the newly implemented MyPyramid food group recommendations. While 95-100% of children were served something from each of the 5 food groups every day, it was noted that, with the exception of the milk group, children were consuming substantially less than that recommended of grains, vegetables, fruit and meat or alternatives. It was also determined that children were consuming excessive amounts of added sugars from snacks and saturated fat from high fat or fried meats. In another

observation study that took place in 40 child care centres in New York, less than half of children observed ate at least 50% of the recommended intake from each of the five main food groups, with only 17% eating at least half of the recommended daily amount of vegetables and 5% obtaining at least half of the daily recommended amount of vitamin E (Erinosho *et al.*, 2011). Half the centres were found not to provide a source of drinking water and only three centres provided water to drink at mealtimes. Another study which analysed three day food records from fifty 3-5 year old children attending day care in Texas found that while 3 year old children consumed enough fruit and meat or alternatives to meet two thirds of the 'Food Guide Pyramid for Young Children' recommendations (since modified to account for children's age, sex and activity level and now referred to as the 'MyPyramid' food group recommendations), they did not consume sufficient grains, vegetables or dairy foods. In contrast, 4-5 year old children only consumed sufficient dairy foods. The authors concluded that 91% of the 3 year olds reached two thirds of their estimated energy requirements while in care, with only 5% of 4 year olds and 25% of 5 year olds meeting this target. Due to lack of specificity in the Texas State guidelines and the small serving size requirements set by the Child and Adult Care Food Program, the authors concluded that *'it is possible for child-care centers to be in compliance with all regulations without necessarily serving children appropriate food to meet their energy and nutrient requirements'* (Padget & Briley, 2005). While this study was limited to reported records of intake, was relatively small and in a limited geographical area, it adds to the evidence that children in care full day care may not be consuming adequate energy and nutrients while in care. Another interesting aspect to this study was that the intakes of the children at home did not make up for the deficit in grain and vegetable intakes while in care.

### **2.4.5.3. Snacks**

Sweitzer *et al.*, (2009) recommended that health professionals should facilitate pre-school providers and parents to provide adequate food choices to meet the nutrition needs of children, finding in their study that although parents may be aware of the importance of providing a nutritious lunch / snack, they may not actually pack a healthy lunch on a regular basis, with poor provision of fruit and dairy foods. In addition, the authors recommended that when parents provide children's snacks, providers must '*address the practices that affect the long-term health and well-being of the children they serve*'. Implementation of an education programme '*Lunch Is In The Bag*', which consisted of parent handouts, classroom activities, education stations, or displays, for parents and children to reinforce key messages, and teacher training, led to direct observation of an increase in the number of servings of vegetables and whole grains provided by parents to their children (Sweitzer *et al.*, 2010). In the Irish setting, Jennings *et al.*, (2011) noted that thirty seven of 54 Irish pre-school managers, when questioned, reported service of unhealthy snacks during the pre-school day.

In a study of 889 health professionals, including dietitians, from six different countries (United States, Mexico, Australia, Spain, Chile and the United Kingdom); participants were asked to give their opinion on 39 parenting practices that are commonly used to promote fruit and vegetable consumption. Parenting practices that were based on external control were viewed as being ineffective while practices that provided structure, non-directive control, and that were responsive were deemed to be effective in promoting fruit and vegetable intake amongst pre-school aged children (O'Connor *et al.*, 2010).

#### ***2.4.5.4 Fluids***

Water is defined as ‘*an essential nutrient*’ (Kleiner, 1999) and ‘*clean, sanitary drinking water shall be readily available throughout the day*’ in the childcare setting (American Academy of Pediatrics & American Public Health Association, 2002). The United Kingdom’s School Food Trust (2012) recommends that children should be encouraged to serve themselves water throughout the pre-school day, stating that children need to drink regularly to prevent dehydration, decrease tiredness and irritability and improve concentration levels; adding that poor fluid intake can lead to difficulties in toileting and so increased risk of urinary tract and bladder infections. The guidelines for childcare settings produced by the Government of Nova Scotia (2011) outline that dehydration, even in its mildest form, can negatively affect brain function, energy levels and alertness in children.

Milk and water are the best drinks for pre-school children (Department of Health and Children (Ireland), 2004; Irish Nutrition and Dietetic Institute, 2012). Squash, cordial, fizzy or carbonated drinks are not recommended as daily drinks for children due to their high acid content which may increase risk of tooth decay (Irish Nutrition and Dietetic Institute, 2012). Unsweetened fruit juice should only be provided once in the day and should be diluted well with water (Department of Health and Children (Ireland), 2004; Irish Nutrition and Dietetic Institute, 2012); sweetened juices are not recommended (Irish Nutrition and Dietetic Institute, 2012).

Sugar substitutes include many artificial sweeteners and are used to sweeten food and beverages without increasing the energy content. Consumption of beverages containing artificial sweeteners is not recommended for children under the age of five years (Department of Health and Children (Ireland), 2004; Government of Nova Scotia, 2011; Irish Nutrition and Dietetic Institute, 2012) as they have poor nutritional value

and tend to displace milk, which is a nutrient rich food (Government of Nova Scotia, 2011). Although replacement of sugar containing beverages with sugar free beverages significantly reduced both body weight and fat gain over an eighteen month period in healthy, normal weight children aged 4 years 10 months to 11 years 11 months of age, the authors suggested that the effect was not due to the artificial sweeteners and hypothesised that water would be as effective (de Ruyter *et al.*, 2012).

In the United States, two thirds of childcare managers (*n* 168) reported, in a telephone survey, that they provided 100% juice to children in their care at least 3 or 4 times per week and over half reported offering juice at least once a day every day (Tandon *et al.*, 2012). A separate study demonstrated through direct observation, that when pre-school children were served one of three types of milk: plain; sugar rich chocolate flavour; or aspartame sweetened chocolate; the type of milk served had no significant effect on other foods eaten at meal times; however, children drank significantly more chocolate milk than plain milk at all meal times, thereby increasing their energy intake significantly (Wilson, 2000). While a study by Erinoshio *et al.*, (2011) reported that drinking water was only available in classrooms in half of the pre-schools observed in their study (*n* 40). In an Irish telephone survey of 54 pre-schools managers, drinks were reported to be served with all meals and on demand in all pre-schools and it was also reported that milk, water, fruit squash, diluted and undiluted fruit juice were served during the day both with meals and between meals and snack times. Only two of 54 pre-schools reported only serving diluted juice, diluted to the recommended strength (Jennings *et al.*, 2011).

## **2.4.6 Staff knowledge, attitude and practice relating to nutrition and health related issues**

### ***2.4.6.1 Staff education***

Although it is acknowledged that competent and well trained workers are necessary and key to the early education environment, it would appear that policy makers and the public are often aghast at the poor levels of education and remuneration amongst this workforce; a wide discrepancy being apparent between the importance attributed to the role of early educators and *'the policies and practices that do not support an adequately compensated professional workforce'* (Early & Winton, 2001).

Training for workers in the childcare setting takes a number of forms; these include post secondary school and degree level qualifications, and comprise pre-service, orientation and ongoing training, with the critical determinant of high-quality child care being continuity of appropriately trained adults (Shapiro Kendrick, 1994). While education for professionals to work in early childcare has been at degree (third) level in many countries for many years (Organisation for Economic Co-operation and Development, 2006), in Ireland the first degree level professional training course only became available in 1995. More common in this country are the qualifications awarded by the Further Education and Training Awards Council. These childcare qualifications are offered across Ireland by a variety of groups and individuals such as: Vocational and Educational Committee centres, adult and community training centres and private entities, with awards varying from basic Level 3 to supervisory Level 6 (O'Kane, 2007). The provision of nutrition training or health promotion training as part of these awards would appear to be dependent on those carrying out the training and is not obligatory. To effectively train child care workers, it has been recommended that the trainer should

visit the child care centres to determine the realities of working in the field and must converse with providers in a language that is familiar and understandable to them; adult learning styles are advocated, integrating training with previous experience, enabling interactive and experiential learning and fostering time for discussion and contemplation (Shapiro Kendrick, 1994). A study which compared ‘web based’ training to ‘in-person’ training of child care health consultants determined that web based training was as effective as in-person training at improving nutrition knowledge for use in the pre-school setting (Benjamin *et al.*, 2008a).

Many barriers to co-ordinated training of child care workers have been documented including: limited funding for training; high cost of training for providers; lack of provider time; few career development opportunities. Added to this, there would appear to be poor respect for child care workers at societal level in some countries which leads to poor wages and low professional status (Shapiro Kendrick, 1994).

Improvement in wages and other child care employee benefits, with a concomitant focus on training and career development, are necessary and will be a catalyst of long term improvement in health and safety for children in this setting (Koch, 1994). It has been documented that to offer a high quality service pre-schools must: hire properly trained staff; ensure optimum group numbers and staff / child ratios; adhere to an educational and developmentally appropriate curriculum; and provide a safe and healthy environment for the children in their care. It is acknowledged, however, that these basic requirements are expensive and in most cases require additional funding and resources (Eichman, 1994).

Clark *et al.*, (2008) determined that providers need more than training on best practice, particularly relating to infant feeding; they also need information on how and

why they should comply with standards. While enforcement may be one way to encourage childcare providers to follow childcare regulations, relative infrequency of site visits may be the reason that this may not be the most effective method to improve feeding practices in childcare centres; instead it has been suggested that provision of training and professional development opportunities or compensation (suggestions for which were not outlined by the authors) may be better strategies to encourage best practice (Benjamin *et al.*, 2009b).

If child care centres are to engage in obesity prevention, then feeding practices that promote healthy weight should be stressed to staff (Sigman-Grant *et al.*, 2011); in comparing the practices of providers who had received nutrition related training, to those who had not, the authors determined that those with training were significantly more likely to engage in supportive feeding practices; however, the source of the information and the person who provided the information were found to be more important to those being trained than the frequency of training provision. Information provided by educators qualified to teach nutrition, and who were perceived to be a credible information source, was more likely to result in positive change in practice, whereas training provided by personnel in health departments who did not have relevant nutrition credentials, or experience, was negatively related to practice change. The authors speculated that this may be because health departments traditionally have a remit for environmental safety and may, in fact, prohibit positive child feeding practices such as self service or child food preparation involvement.

#### ***2.4.6.2 Staff practice***

There are guidelines and recommendations, available in the United Kingdom and Ireland (Department of Health and Children (Ireland), 2004; School Food Trust, 2012),



relating to childcare staff interaction with children during meal and snack times in the pre-school setting. Those guidelines that emanate from the United States on this topic, however, are much more comprehensive in their detail (American Academy of Pediatrics & American Public Health Association, 2002; American Dietetic Association, 2011). The development of a positive mealtime experience for children is an important part of healthy food habit formation, and the caregiver should be a role model who sits at the table and eats with the children (American Academy of Pediatrics & American Public Health Association, 2002; American Dietetic Association, 2005). Setting simple rules for children at the table is necessary and important to ‘*create a peaceful mealtime environment*’ (Benjamin, 2007). The mealtime should be unhurried (American Dietetic Association, 2005). Social interaction and conversation, especially conversation regarding nutrition and food, enhances the mealtime experience and helps children to accept food and develop appropriate eating behaviours (Hendy & Raudenbush, 2000).

#### *Staff sitting with children*

Children should not be left alone to eat at mealtimes. Instead food times should be viewed as a valuable opportunity for encouraging children to experience a sociable occasion; one where the discussion of the food eaten should be seen by staff as integral to each child’s education (School Food Trust, 2012). Staff must ensure that children sit to eat their food and that they ‘*do not eat while walking, running, playing, lying down or riding in vehicles*’. Childcare staff should be ‘*seated within arm’s reach*’ of children in the early years who are learning to feed themselves, while children who are over 12 months of age and are capable of feeding themselves should be supervised by an adult who sits at the same table. Close supervision prevents children engaging in activities

that may lead to choking for example ‘squirreling’ of numerous pieces of food into the mouth at once (American Academy of Pediatrics & American Public Health Association, 2002). Only one infant should be fed at any one time by a childcare provider; to feed more infants than this makes it difficult for the staff member to read child feeding cues. If older children need feeding assistance, one adult should not be providing assistance for more than three children, as to do so ‘*resembles an impersonal production line*’ (American Academy of Pediatrics & American Public Health Association, 2002).

Despite the recommendations on the importance of sitting with children, a large scale study of mealtime practices in pre-schools across four States in the United States determined through in-depth interviews with childcare managers that only 62% reported sitting with children for the entire mealtime, 9% reported being in the room but not sitting at the table and 29% reported sitting but also getting up and down from the table during the mealtime (Sigman-Grant *et al.*, 2008).

### *Staff eating with children*

When staff sit and eat with children they act as positive role models. Staff can stimulate conversation and get a better understanding of children’s views on foods being provided so enabling better communication with parents regarding children’s eating habits and food likes and dislikes (School Food Trust, 2012); social interaction should be encouraged and conversation should be fostered on food in terms of: its colour; temperature; the quantity and number of types of food available. Events of the day should also be discussed (American Academy of Pediatrics & American Public Health Association, 2002).

Addressi *et al.*, (2005), in a study of twenty seven children aged 2-5 years, observed that children were more likely to eat new foods if teachers were eating the same foods, and children were found to eat more when they ate with someone who is familiar to them than when they eat alone or with someone who is perceived as a stranger (Salvy *et al.*, 2008). Despite this, an observational study in the United States determined that while 69% of caregivers were seen to sit with children at mealtimes, only 53% ate the same food as the children were consuming, with many staff consuming no food at all (Nahikian-Nelms, 1997). Hendy (2002) noted that eating with children was a rare practice; observation of 42 pre-school lunches determined that, on average, pre-school teachers ate less than 25% of the foods that were offered to the children.

#### *'Family style food service'*

Many guidelines refer to the educational and health benefits of 'family style food service', with adults sitting, eating, and making conversation with children during mealtimes, allowing children to self serve, allowing sufficient time for meals and providing correct utensils such as plates for all meals and snacks. The promotion of the 'family meal' has been advocated as a potential public health tool to improve dietary quality and educational and social outcomes and reduce overweight (Cason, 2006), with mealtimes being a time of pleasure and enjoyment uninterrupted by distractions such as the television and telephone.

The National Food Service Management Institute in the United States defines 'family style food service' as *'meals in which child-size tables are set with plates and utensils. Food is passed in small containers for children to serve their own plates. Children may pour their own beverages from small pitchers'* (National Food Service

Management Institute (United States), 2003). The process provides many advantages for a child's development by promoting motor skills, language, self esteem, social skills, table manners and independence. This type of food provision may also help with fussy eating, encouraging a picky eater to try and accept foods that it sees its peers serving and eating (National Food Service Management Institute (United States), 2003). The four main components are: table setting; food preparation; self-service; and clean-up. During meal times in childcare, young children are learning many things including how to control muscles, particularly in their hands; it is, therefore, important that lots of room and space are given to children. This space will allow children to '*pass, serve, pour and eat*'. Furniture should be arranged so that children can '*sit, rise, and walk around the table without interfering with others at the table*'. High chairs should be moved into the table '*close enough that the little ones can see what's going on and be part of the mealtime experience*' (National Food Service Management Institute (United States), 2010).

'Family style food service' should be encouraged for all children except for infants and very young children who require an adult to feed them. It encompasses the promotion of eating as an enjoyable experience. It encourages staff to give extra help and time to those children who may be slower and prevents food time behaviours such as '*fighting, feeding each other, stuffing food into the mouth*'. 'Family style food service' also encourages children to serve themselves; once a child is developmentally able to finger feed, it can begin to serve itself food from a plate. Observation allows childcare providers to determine how well 'family style food service' is progressing; therefore, sitting and eating with children is fundamental. Provision of small jugs, a small number of servings on a central plate and ensuring adult assistance is available all make 'family style food service' feasible whilst preventing contamination and excess

waste. Facilitating older children to become involved in preparation for meals such as setting tables, and in the conclusion of meals by cleaning table surfaces and removal of crockery and utensils, enables children to develop self help skills and dexterity through new motor skill development. Staff should supervise closely to prevent contamination and ensure adequate cleaning takes place (American Academy of Pediatrics & American Public Health Association, 2002).

Although a large scale study of mealtime practices in pre-schools across four States in the United States determined that 80% reported engaging in ‘family style food service’ (Sigman-Grant *et al.*, 2008), these data must be considered with caution as they were based on reported rather than observed practice. In a study carried out by Nahikian-Nelms (1997), it was observed that only 2 of 24 child-care providers carried out ‘family-style meal service’. As a component of the study, a behaviour checklist was developed for use as an observation tool during meal times. The criteria on the checklist were selected as the published literature suggested that they were important in the interaction between childcare workers and children during meal times. Meals reportedly provided in Head Start schools in the United States are a combination of family style and prepared plates with main courses pre-plated and vegetables, fruit, bread and milk passed around to enable children to serve themselves (Gable & Lutz, 2001). Indeed interestingly, an examination of children’s perception of food and their food experience demonstrated that children modelled food practices, meal patterns, food safety behaviours and caregiver feeding techniques that may have been observed elsewhere (Matheson *et al.*, 2002). A study which observed play episodes in 24 children noting that children’s food preparation and relationship with food ‘*often mimicked the stereotype of busy parents*’, with children displaying traits and mannerisms observed from adult caregivers, such as: speaking on the telephone whilst

cooking; being impatient with the microwave oven while using it to cook; and eating whilst standing to cook. Less than half of the children observed sat down to eat; only three used ‘family style food service’ and only four offered a choice of what to eat. When children in the role play scenario were told that the person to whom they offered food did not want it, ten children were indifferent or ignored the comment; eight provided an alternative food and three children insisted that the food given should be eaten, with one child even trying to force feed the adult (Matheson *et al.*, 2002).

The effect of ‘family style food service’ on food and nutrient consumption has been explored in the literature. In a study of children aged 9-12 years, increased consumption of energy, protein and fat with less wastage was observed by researchers when children were allowed to participate in ‘family style food service’ rather than ‘cafeteria style dining’; however, the authors did not assess the effect on total energy intake nor the source of the macronutrients (Donnelly *et al.*, 2000). However, in a questionnaire based study of parents, eating in a ‘family style’ and ‘having the television on while eating dinner’ were found to be independent predictors of dietary quality in low income pre-school children, with ‘family style’ dining positively associated with fruit, vegetable and milk provision (Fitzpatrick *et al.*, 2007) and the number of times per week television was on during dinner time being negatively associated with fruit and vegetable intake. Those who never or rarely watch television during mealtimes were reported by parents to be found to be less likely to consume soda and crisps (Andaya *et al.*, 2011) suggesting perhaps that viewing of television may be a marker for other unhealthy traits.

In a telephone survey of Irish pre-school managers of full day care services, in fifty of 54 it was reported that staff spoke with children about healthy food choices during mealtimes and 23 managers reported staff eating with children; however, 45

managers reported that staff encouraged children to finish food on their plate. Large variation in the management of fussy eating appeared to exist amongst pre-schools with strategies including: encouragement (*n* 11); peer modelling (*n* 6); altering appearance of food (*n* 5); setting time limits (*n* 5); provision of assistance with eating (*n* 4) and serving preferred food to avoid food being refused (*n* 4). Five managers reported repeating exposure to food refused and 39 reported that they provided alternative food when food was refused (Jennings *et al.*, 2011).

#### *Adequate time provision for food times*

Duration of a food episode is strongly determined by the caregiver, reflecting what they perceive should be an appropriate mealtime duration. It is important to remember that all children eat at different rates, and so when planning meal and snack timings, cognisance should be given to those children who may take longer to eat, thus ensuring that no children miss out on food or activity as a result. Meal and snack times should not be shortened to facilitate other activities; any distraction may lead to poor consumption by children at the meal or snack time (School Food Trust, 2012).

#### *Encouragement to self feed*

Child care providers have a similar role to parents as they influence children's eating by their modelling, by providing instruction or by not providing direction and leaving children to eat as they wish (Hughes *et al.*, 2007). In the United States, the American Academy of Pediatrics and American Public Health Association (2002) states that '*caregivers shall encourage toddlers to hold and drink from a cup, to use a spoon, and to use their fingers for self-feeding*'; while Benjamin (2007) recommends to '*allow young children to feed themselves even if they make a mess. They need to explore the*

*foods they are eating. This does not mean letting them play with their food. When they begin to play they are no longer interested in eating. Toddlers need lots of patience to learn to finger feed, use a spoon and drink from a glass or cup. Try to balance learning new skills with enjoyment of eating’.*

The encouragement of self-feeding delineates the roles and responsibilities of adults and children in the feeding relationship, with the adult being responsible for provision of adequate nutritious food and the child being then responsible for deciding how much to actually eat (Benjamin, 2007; Government of Nova Scotia, 2011; Satter, 2012). This practice is termed the ‘*division of responsibility in feeding*’ (Satter, 2012) and key to this is the role of the parent or caregiver, who must trust the child to decide how much and whether to eat.

The best environment for a child to develop an ability to self regulate energy intake is one where adults provide healthy food but allow children to determine the amount they consume (Johnson & Birch, 1994). Children may not eat all the food offered at any time, perhaps eating only some of the meals or snacks provided; however, the quantity of food supplied must be adequate to meet the child’s needs at each time point should the children wish to eat (American Academy of Pediatrics & American Public Health Association, 2002). However, a large scale study of mealtime practices in pre-schools across four States in the United States determined that only 38% reported allowing pre-school children to serve themselves (Sigman-Grant *et al.*, 2008).

Poor self-regulation and inability to delay gratification have been linked with weight gain; those children with poor self-regulation, as reported by their parents at 3 and 5 years, were shown to gain weight more quickly than those with high self-regulation (Francis & Susman, 2009), while Seeyave *et al.*, (2009) in a longitudinal prospective study determined that children with limited ability to delay gratification at 4



years of age were more likely to be overweight at 11 years. A further prospective longitudinal study of 844 children in the United States, determined from father, mother and teacher reports, that children rated by parents as having higher self control at nine years of age were less likely to be overweight by the age of 15 years (Tsukayama *et al.*, 2010) further adding to evidence published by Birch *et al.*, (2003) who reported, in a longitudinal study, that restrictive eating practices in young girls can promote overeating when palatable food is presented in middle childhood.

Studies have demonstrated that allowing children to serve themselves facilitates self regulation. In a small study of pre-school children aged 4-6 years in which 24 hour dietary histories were collected from 5-7 consecutive days, it was noted that the most important factor impacting on the quantity eaten by a child was the amount of food served by their caregiver (Mrdjenovic & Levitsky, 2005); this was similar to the finding by Rolls *et al.*, (2000) who through direct collection of dietary intake described this phenomenon in 5 year olds. However, an experimental study carried out by Orlet Fisher *et al.*, (2003) demonstrated that when children were allowed to serve themselves food, they selected amounts that were similar to reference portion sizes but that when children were given large pre-plated portions they consumed approximately 25% more food.

Feeding strategies used by parents and caregivers have been classified as: repeated taste exposure; modelling; restricting access to food; pressuring strategies i.e. providing rewards in a coercive context; and strategies of encouragement i.e. provision of rewards to reflect achievement (Moore *et al.*, 2009). An observational study of food time in primary schools in the United Kingdom noted that '*without exception, feeding was a lower priority than maintaining behaviour, clearing up and managing the throughput of children during what was a task-intensive and unpredictable period*'

(Moore *et al.*, 2009). It was also observed that few opportunities to encourage eating were seized upon by staff, even when carrying out tasks such as cutting up food and often children were told that '*an entrée must be eaten before a dessert*'.

Rolls *et al.*, (2000) recommend that parents and childcare providers should be encouraged to provide children with autonomy when deciding how much they wish to consume and should avoid the use of practices that encourage children to focus on portion size; avoiding the use of language with children such as '*cleaning up your plate*'. However, in a study in 13 American Head Start pre-schools, a 22 item checklist, the Feeding Behavior Coding System, was used to observe and document type and frequency of feeding behaviours of pre-school providers. Behaviours were classified into authoritative, authoritarian and two permissive styles: indulgent and uninvolved (Hughes *et al.*, 2007). Authoritative feeding is described as '*adequate control over children's eating through reasoning and involvement*'; authoritarian feeding behaviours are described as '*extensive external control on the part of the caregiver*'. Permissive behaviour is where a carer encourages a child to eat whatever quantities they want, offering no support or encouragement for self-regulation and failing to monitor child behaviour. Authoritative and authoritarian feeding behaviours were displayed most frequently by the child care providers studied (Hughes *et al.*, 2007). Indulgent feeding behaviour was associated positively with children consuming more food in the childcare setting regardless of the type of food, healthy or unhealthy, while authoritative feeding behavior led to an increase in specific food type, dairy food (Hughes *et al.*, 2007). The authors suggest that these findings have implications for future intervention planning, outlining the need for childcare providers to ensure that only healthy food is provided and that providers model and are specific in their advice to children regarding food offered, i.e. '*drinking your milk will make you big and strong*'. Indeed research has

demonstrated that children whose parents practice indulgent feeding behaviours are at most risk of becoming overweight (Hughes *et al.*, 2005; Hughes *et al.*, 2008; Hughes *et al.*, 2011).

#### *Fussy eating and neophobia*

In childhood, children approach new foods with ‘*a mixture of interest (neophilia) and fear (neophobia)*’ (Cooke, 2007). Usually neophobia begins as a child reaches the age of 2 years, when they are becoming more independent. Children who are given lots of opportunity to try healthy food at a young age seem to have healthier, more diverse diets through their childhood. Repeated exposure of children to ‘new’ foods results in a reduction in neophobia and an increase in liking and intake of novel foods (Cooke *et al.*, 2011), particularly when exposure is accompanied by non food rewards or praise. A recent study in the United States determined that repeated exposure to vegetables in the childcare setting may have a different outcome to that seen in a laboratory situation, recommending that repeated exposure should be continued for several months rather than just 10 times, as in the childcare setting exposure on 10 occasions may not result in 10 episodes of tasting. The authors, however, noted that in the childcare situation a positive peer influence on tasting occurs and that strategic placement of ‘good eaters’ at meal times could potentially increase vegetable consumption (O’Connell *et al.*, 2012).

Links have been found between early exposure to food and subsequent acceptance of that food. Cooke *et al.*, (2004), in a cross sectional questionnaire based study of 564 mothers in the United Kingdom, highlighted a positive association between early introduction of fruit and vegetables and higher consumption of these at age 2-6 years. Skinner *et al.*, (2002) showed that eating fruit often in the first 2 years of life, determined through interview with 70 mother / child pairs in the United States, was

linked with eating a large range of fruit during the school years; ascertained by collection of 3 day dietary intake at that time point. Shim *et al.*, (2011) demonstrated, through the collection of self reported data from 129 mothers in the United States, that early introduction of complementary food and cessation of breastfeeding before 6 months of age was linked with the development of picky eating and neophobia.

A study which questioned 7,821 mothers aimed to follow up children involved in the Avon Longitudinal Study of Parents and Children project. Self reported data from mothers determined that, in comparison to children introduced to lumpy food by 6-9 months, children who were not introduced to lumpy foods until after the age of 9 months ate fewer of the main food groups at 7 years of age and this included all fruit and vegetables studied ( $P < 0.05-0.001$ ). These same children were also reported to have significantly more feeding problems at 7 years of age ( $P < 0.05-0.001$ ) (Coulthard *et al.*, 2009). This study adds to evidence generated by Northstone and colleagues who questioned 9,360 mothers and reported that the introduction of ‘lumps’ in food at the correct stage during the weaning process leads to a greater variety of family type foods being eaten at 15 months (Northstone *et al.*, 2001).

A retrospective questionnaire based study of 140 college students noted that many of their common food dislikes could be traced back to a time when they as children experienced pressure to eat specific foods (Batsell *et al.*, 2002). It has been noted that pressuring children to eat is not effective in promoting food intake and that it leads to children having negative affective reactions to the foods they are pressured to eat (Galloway *et al.*, 2006). These authors determined from their work that children who were pressured to eat by their parents in the home environment had significantly lower body mass index scores than those who had not been pressured to eat. This study confirmed previous work carried out by this group (Galloway *et al.*, 2005) which

demonstrated that seven year old girls who were thin, but not underweight, were more likely to be pressured to eat by their mothers, who also considered them to be ‘picky eaters’. The findings relating to the effects of pressurising children to eat were reinforced by the study of the college students which demonstrated that a very high percentage of the students reported having had a negative eating experience and that the food they were forced to consume was still a food they would avoid eating (Batsell *et al.*, 2002).

Parental reported pressure to eat has been found to be associated with lower measured child body mass index, and an observed reduction in average calorie and energy density intake (Lee & Keller, 2012), with children eating significantly more food when they were not pressured to eat (Galloway *et al.*, 2006). A study in the United States, which analysed video observations of mealtimes in childcare centres, determined that the phrase ‘Are you done?’ is commonly used; occurring at approximately 30% of mealtimes. Children were also asked to eat without any reference to satiation or hunger (Ramsay *et al.*, 2010). In addition this study found that there are three distinct phases of comments made to children during meals in childcare: cueing children to take food; keeping children focused on eating and, finally, finishing the food time.

A study which questioned 219 mothers of children aged 3-6 years regarding their feeding strategies determined that the practice of rewarding with food was associated with an increase in children’s intake of unhealthy food, while parental modelling was linked with a decrease in unhealthy food consumption and an increase in healthy food eaten (Kröller & Warschburger, 2008). The provision of enthusiastic rather than silent modelling, particularly during the first five meals of novel food introduction, and the avoidance of placing competing peer models at the same table,

was found to encourage children to accept new food in an experimental study (Hendy & Raudenbush, 2000).

Education about ‘family style food service’ and the effect of children’s feeding issues on eating behaviour is necessary (Lohse *et al.*, 2012). A qualitative study of American low-income caregivers noted their concerns about division of feeding responsibilities, particularly in allowing children to choose what to eat, while the implementation of the digital ‘*Mealtime is Family Time*’ to educate pre-school staff about the importance of ‘family style food service’ demonstrated that the programme was seen as positive and was well received (Lohse *et al.*, 2012).

#### **2.4.7 Role and involvement of parents**

Child care providers are recommended to inform parents regularly about the food learning activities in which their children have engaged during the pre-school day. It is suggested to offer nutrition education programmes to parents at least twice a year and to survey parents beforehand as to what they might be interested in learning. Co-ordination of what one is teaching children, and what one is telling parents is important, and tips are suggested to help childcare providers to communicate with parents: regular newsletters or handouts; tips sheets for the refrigerator; clearly displayed and accurate menus; cookbooks of children’s favourite recipes from the childcare service. It is also important for child-care providers to endeavour to get parents involved with their child’s food habit development, with a suggestion being to send home food related activities for children to complete with their parents such as: growing food or making a snack; inviting parents to visit at meal time and getting children to help to prepare the meal that will be served; getting parents to suggest recipes and then discussing these with the children and introducing them into the pre-school (Benjamin, 2007).

It has been recommended that child feeding practices and parenting style, and their potential effect on dietary intake and child weight, should be included in future childhood obesity research (Stang & Loth, 2011). Obesity prevention should enhance *'the effectiveness of parent practices related to diet and physical activity / inactivity behaviors'* (Ritchie *et al.*, 2005), rather than only focusing on weight. Behaviours should include: provision of access to nutrient dense, high fibre foods at meals and snack times; reduction of high calorie, nutrient poor food and fluids both at home and while outside the home; avoidance of excessive restriction or use of nutrient poor foods as rewards; encouragement of breakfast consumption; introduction of fun ways to increase physical activity; reduction in television and screen time and modelling of physical activity and healthy eating for children. The authors also outline recommendations for health professionals stating that *'recommendations that have the possibility of benefit, with no likelihood of risk, can be safely invoked until more data are forthcoming'*.

Child feeding practices differ from parenting style and include various behaviours including modelling eating behaviour; pressuring children to eat; rewarding behaviours with food; withholding food as punishment; food intake restriction; concern about children's weight; provision and accessibility of food for children (Stang & Loth, 2011). Three types of parenting have been described: permissive parenting, where parents allow children to make their own decisions and manage their own activities; authoritarian parenting involving overt psychological control such as induction of guilt or shame; and authoritative parenting whereby parents provide large amounts of warmth with low levels of coercive control; being supportive and collaborative rather than restrictive (Golan & Bachner-Melman, 2011). Research has shown that children of authoritative parents are more likely to eat healthily, be more physically active and have

lower body mass indexes than children raised by parents using other parenting techniques (Darling & Steinberg, 1993). Relying on ‘trust’ rather than ‘control’ is central to the theory of division of responsibility (Satter, 2012); children of authoritarian parents are five times more likely to be overweight, and children of permissive parents are twice as likely to be overweight as those children of authoritative parents (Rhee *et al.*, 2006).

In 2007 and 2008, a focus group investigation of American mothers determined that they ‘*consistently described their lives as busy and hectic*’; mothers preferred messages that were practical and were less likely to listen to tips on activities that would take up too much time or would lead to lots of clean-up. Appealing activity messages were ones that were linked with teaching their children either a new skill, greater self-esteem or helping to make them happy. Mothers believed that they are role models for their children and identified strongly with messages that children ‘*learn by watching you*’ and ‘*take their lead from you*’. It was found that mothers engaged well with the idea of meals being the ideal time to ‘*create positive memories for their families*’ and ‘*as a time for teaching their children healthy habits*’ (United States Department of Agriculture Food and Nutrition Service, 2008). Ten tips were provided by the United States Department of Agriculture Food and Nutrition Service for use when designing print resources for mothers; these included: placing the core message in a very visible position on a resource (i.e. on the front page); inclusion of an interactive element, i.e. goal setting section; using bolding, boxes, circles or arrows to highlight information; employing bullet points for ease of reading; applying left justified and right ragged margins; limiting content, focusing on tips that are action based and reinforcing the main message; utilising an appealing design with similar colour, themes and fonts;



including photographs so that the audience can picture themselves; keeping culture in mind, and including contact details to enable the audience to get more information.

A focus group study of low income mothers in the United States determined that certain health promotion messages were welcomed, while others were not. Messages were perceived as positive if they promoted a mother's role as a teacher, or someone who encourages a child's self-esteem, development and independence. Mothers reported using food as reward and punishment, but did not perceive this use to be bribery or forceful behaviour and described offering new foods only a couple of times feeling that offering food more often than this would be 'forcing' the food. The authors described mothers as being hesitant to let children decide how much to eat, but were open to 'family style food service' (White *et al.*, 2011). Another qualitative study of 91 lower socio economic mothers of pre-school aged children in the United States determined that many had strong negative emotions and memories about being fed when they were growing up. However, these mothers displayed strong pride in the 'child pleasing' feeding methods they were using with their own children. They also described childhood obesity as being caused by '*inept or neglectful parenting*'. The authors concluded that interventions involving parents should be cognisant of the context in which child feeding takes place, being aware of how a mother feels about herself as a parent and the potential impact of this on her ability to implement best practice recommendations (Kalinowski *et al.*, 2011). This provides great insight into approaches to working with parents, adding to the knowledge base garnered by Hingle *et al.*, (2010) who, in a review of parental involvement in child intake improvement interventions, determined that studies which used direct methods to engage parents, such as requesting parental attendance at nutrition education sessions, were more likely to report positive or mixed results than those studies using indirect methods, such as

provision of information or 'try this at home activities'. While working parents express a desire to carry out family meal times and to get children involved in making meals, they express worries about time limitations and the 'mess' involved. Creating programmes that help families plan and cook healthy meals, develop cooking skills and increase healthy food consumption has been advocated to encourage parents to participate in 'family style meal service' (Fulkerson *et al.*, 2011).

It has been recommended that nutrition education should be targeted at mothers who smoke, mothers who are younger and mothers who are less well educated, as the children of mothers from these groupings, aged 18 months in the Avon Longitudinal Study of Parents and Children study, were found to consume a less healthy diet than children of other groups when measured using 3 day dietary intake records (Rogers *et al.*, 2003). Provision of nutrition education has been reported by parents to be significantly correlated with a reduction in sugar sweetened beverage consumption in their children; this effect was heightened by also teaching the parents the behavioural skills to choose the best drinks through the reading of nutrition labels (Goodell *et al.*, 2012). Gross *et al.*, (2010) also confirmed the importance of modifying parent behaviour, noting that in older children, interventions developed to increase children's fruit and vegetable intake should target parental intake and feeding practices. Specifically parents should be encouraged to: increase their fruit and vegetables consumption; make fruit and vegetables available at all meal and snack times, including lunch brought in from home to the school setting; involve children in shopping for, and preparation of, fruit and vegetables. In fact, mothers with good fruit and vegetable intakes were demonstrated to be less likely to pressure their daughters to eat and their daughters, in turn, consumed more fruit and vegetables and were less picky (Galloway *et al.*, 2005). The introduction of behaviourally based interventions would appear to

have a positive effect on practice. In an intervention aiming to increase physical activity in pre-school aged children, the introduction of a 10 week family focused active play intervention significantly increased their physical activity time on week and weekend days, measured using parent and child uni-axial accelerometers (O'Dwyer *et al.*, 2012). The introduction of an eight week healthy eating information curriculum to parents in the home was found to be 'very helpful' by all those who received training with a concomitant increase in vegetable variety served and eaten post intervention, as measured with 3 day dietary records (Horodynski *et al.*, 2012).

#### ***2.4.7.1 Parents and childcare facilities***

*'A community focused plan that is sensitive to and derived directly from local input will ultimately enable children and their families to make choices and adopt practices that will improve the imbalance between dietary intake and energy expenditure'* (Kessel & McCarron, 2010). While the importance of engaging parents in their child's development is undisputed, the role of the childcare centre in prompting this interaction is somewhat more tenuous, with issues apparent that may impact on the childcare establishment's ability to promote parents to undertake best practice behaviours with their children.

A study which assessed parents' perception of quality of the nutrition and physical activity of their childcare centres, found that of the 508 parents who responded (27% response rate), the majority reported meals, snacks and physical activity to be excellent or good (rated on a Likert scale). A number of parents, however, made suggestions for improvements, including increased fruit and vegetable provision, increasing the variety of food offered, decreasing the amount of low nutritional quality food served, increasing whole grain provision, and increasing structured play and

outdoor time (Benjamin *et al.*, 2008b). The authors concluded that there may be a number of reasons why parental perception of the pre-school quality may have been so good, such as being unaware of what was being provided to their children, not wishing to admit that quality may be poor while they are exposing their children to this provision, particularly when parents may have a limited choice of childcare and do not wish to speak disparagingly of their childcare centre.

In the United Kingdom, a postal survey of 345 childcare workers was followed with in-depth interview (*n* 25) to further explore the themes that emerged. A poor partnership was shown to exist between childcare providers and parents, with child care workers reporting that they rarely involved parents in menu planning or dietary discussions, that few wished to negotiate food provision with parents and that the majority of mealtime struggles with children were because of the different foods they got from parents at home (Moore *et al.*, 2005). A focus group investigation in the United States, comprising six focus groups, with 24 parents and 45 childcare workers determined a number of perceived barriers that may affect introduction of health promotion initiatives to the child care setting: group sessions and peer education are key to providing health information; parents and providers require better linkage to health professionals; interventions should be culturally and linguistically appropriate; frustration expressed by providers regarding parents' attitudes and need to overcome this to ensure success; need to be cognisant of the huge diversity in training experience when planning training (Taveras *et al.*, 2006). In Ireland, pre-school managers, when questioned, felt there was a need for parent education; inaccurate weaning knowledge of parents and poor home diets were cited as barriers to healthy food provision. While fourteen of the 54 managers questioned reported having formal meetings with parents, nutrition issues were only raised in two such meetings. Six managers reported that

parents' expectations included: that all a child's nutrition should be provided within the pre-school setting; and that staff should coerce children to finish meals (Jennings *et al.*, 2011).

## **2.5. Motivating change in practice**

### **2.5.1 Interventions in childcare research**

Flynn *et al.*, (2006) and Lanigan *et al.*, (2010) note that there are few nutrition interventions in the pre-school setting and recommended that funding should be directed to develop such programmes, while Ward *et al.*, (2008b) suggest that because the pre-school environment has the capability to have a positive effect on many children's health it is a '*unique and important setting for interventions to prevent childhood overweight*'.

Health professionals have been encouraged to work with parents, guardians and child-care workers to both prevent and treat obesity in young children (American Dietetic Association, 2011). Summerbell (2007), however, expressed the need for caution when perusing intervention studies noting that '*one specific program will not meet the needs of all*' and that methods that work with older children and adults may not, in fact, work with younger children.

*'Contemporary pre-school heart health programs are based on the premise that for children to be able to take care of themselves, they need to know what to do to keep themselves healthy (knowledge), need to believe that healthy living is really important to them (good attitudes), and need the opportunity to practice good health behaviour, not just talk about it (actions and behaviour)'* (Hayman *et al.*, 2004).

'*ToyBox*' is an European Union funded study that aims to develop and test an innovative evidence based obesity prevention programme for children aged 4-6 years, based in kindergarten, but with family involvement (ToyBox, 2012); this programme is currently being undertaken by a multidisciplinary team of researchers from 10 European countries and is ongoing.

A number of initiatives that include intervention and control arms, in various countries, have demonstrated positive effects on children within the pre-school setting. In the United States, the '*Color me Healthy*' programme, involved the measurement of 263 pre-school children's fruit and vegetable intake one week before the introduction of an interactive nutrition and physical activity curriculum programme, and again at one week and 3-month intervals post-intervention. Fruit and vegetables were weighed before, and immediately after, children's food snack time. It was demonstrated that those children who received the '*Color me Healthy*' programme curriculum, significantly increased their fruit (20.8%) and vegetable snack consumption (33.1%) from baseline to a 3 month follow-up assessment, compared to those children who did not (Witt & Dunn, 2012).

A clustered, randomised, controlled trial of migrant children from forty public pre-schools in Switzerland which implemented a lifestyle intervention demonstrated, through direct measurement, increased aerobic fitness and motor agility and improved body fat and waist circumference in children in the intervention compared to the control group. However, no effect on measured physical activity or on body mass index was noted (Puder *et al.*, 2011).

The '*Munch and Move*' programme was initiated in Australia to support childcare professionals to promote healthy eating and physical activity. An evaluation of intervention (*n* 15) and control (*n* 14) pre-school services assessed lunchbox contents,

fundamental movement skills, policies and practices and staff knowledge, attitudes and confidence regarding healthy eating, physical activity and use of screen time. A significant improvement was directly observed in fundamental movement skills in children in the intervention arm of the study, and the number of movement skill sessions occurred significantly more often than in the control group after the intervention. A lunchbox audit also demonstrated significant reduction in sweetened beverages in the intervention group. No significant difference was noted in the other areas studied, with authors hypothesising this may have been due to the short implementation time (5 months) or the deliberately low intensity programme content (Hardy *et al.*, 2010). In a separate Australian intervention, '*The Tooty Fruity Vegie project*', researchers worked with eighteen pre-schools catering for children aged 3-6 years. The study was a clustered, randomised, controlled intervention that aimed to decrease overweight and obesity prevalence and included both nutrition and physical activity strategies. The follow-up time was greater in this study than the '*Munch and Move*' intervention; 10 months. At follow-up, fundamental movement skills, lunch box audit and anthropometric measurements of children were undertaken; in addition, parents were surveyed on their children's dietary intake and physical activity behaviours. Children in intervention pre-schools significantly improved their movement skills, ate more fruit and vegetables and were less likely to have unhealthy food in their lunchboxes. They also displayed significant and welcome changes in waist circumference and body mass index Z scores when compared to the control group (Adams *et al.*, 2009; Zask *et al.*, 2012).

The '*Early Years Health Promotion Project*' was set up in the North West of Ireland to support child care services to develop and implement healthy nutrition and physical activity policies, to implement programmes of physical activity and quality

outdoor play and to promote the benefits of nutrition, physical activity, oral health and sun safety to parents, children and child care workers (Health Service Executive *et al.*, 2010). Upon evaluation, the project authors reported an high incidence of healthy eating, physical activity and outdoor play policies and a significant attitudinal change to health promotion activities amongst parents, child care services management and staff, and children. Results, however, were based on manager ( $n$  31) feedback through quantitative and qualitative questionnaire administration, rather than observed practice, and a control group was not available for comparison.

### **2.5.2 Development of tools to assess and promote best practice in early childcare**

*'High-quality measures of food and physical activity environments are vital components of research assessing the influence of these environments on diet and activity behavior'*; measurement of food and physical activity environments is, however, relatively recent with both self-reported and observer based methodologies being developed in a number of disciplines such as nutrition, psychology, geography and public health (McKinnon *et al.*, 2009). Child care settings have unique physical and social aspects that are not measured adequately by tools designed for the assessment of the school, home or built environment (Bower *et al.*, 2008).

#### **2.5.2.1 Awards**

The 'health promoting schools' approach' entrenches healthy eating and physical activity into the school's policies, physical environment, curriculum and community; healthy awards schemes have emerged and supply structured framework, health related targets and external support for schools. While these concepts have been mostly



targeted to the school environment, they may also be appropriate for the early childcare and education setting (Honisett *et al.*, 2009).

In Australia the '*Kids – Go for your life*' programme employs an award system to encourage schools and early childhood settings to support healthy eating and physical activity using the health promoting schools' approach (Honisett *et al.*, 2009). The development of the programme award scheme involved a number of phases: identification of the most appropriate design for such an award programme; determination of the most appropriate components of such a scheme; and the testing of the award programme scheme in the field. A limitation of this award scheme was that it was based on self-assessment; the child care settings, in particular, scored their practice very well against the award criteria, perhaps overestimating the health practice status of their services.

The '*Start Right-Eat Right Award Scheme*' was implemented in Western Australia and is based on using an incentive to motivate improvement in food service in the childcare setting (Pollard *et al.*, 2001). The development of the scheme involved four stages: needs assessment; piloting of award and development of resources; implementation of award, including training of staff, menu assessment and dietitian visit; and maintenance of award scheme, with centres receiving the award for one year. Renewal follows a further application, with resubmission of menus and an award checklist, and possible random site visit to confirm award criteria are being met. A telephone evaluation of the scheme determined that those centres engaged in the incentive scheme were more likely to follow national guidelines. The promotion of practices that were conducive to appetite self regulation, and the provision of healthy celebration foods were reported more often, when compared to centres not engaged with the intervention (Golley *et al.*, 2012).

### 2.5.2.2 *Self assessment tools*

There would appear to be a number of curriculum and education based interventions and programmes targeting the child care centre; however, until the development of the *'Nutrition and Physical Activity Self-Assessment for Child Care'* (NAP SACC) intervention in the United States, it seemed that there were *'no published studies of environmental and policy-level interventions in child care that target the provider'* (Ammerman *et al.*, 2007). The authors recommended that improvements to play space, equipment, foods served, staff role modelling and health related policies would in turn lead to sustainable improvements in nutrition and physical activity. The *'Nutrition and Physical Activity Self-Assessment for Child Care'* is a self assessment, environmental intervention for the child care sector. Its aim is to improve the diet, physical activity, social and physical environment to support healthy weight amongst children, boost the marketability of the centres and provide staff with continuing education regarding nutrition and physical activity (Ammerman *et al.*, 2007; Benjamin *et al.*, 2007b; Trost *et al.*, 2011). The authors note that validity testing scores on the self-assessment tool were higher than those on a simultaneously tested observation tool, but that this was expected as *'self-report may be associated with social desirability. Child care directors may wish to describe their center in the best possible light'*; concluding that the self assessment tool was developed to *'spark interest'* amongst child care workers and a more objective measure such as the Environment and Policy Assessment and Observation (EPAO) tool may be warranted to capture accurately childcare policies and practices (Benjamin *et al.*, 2007b).

A study group in Connecticut, United States, (Henderson *et al.*, 2011) developed and validated a self-administered survey to assess the nutrition and physical activity environment of childcare centres. The survey is completed by childcare directors and

validation included in-person interviews with directors and 3-4 hour observation of the environment. Criterion agreement was highest for policy determination and lowest for physical activity and determination of the barriers to health promotion in this setting. Food score assessment agreement was moderate.

### **2.5.2.3 Observation based tools**

The Environment and Policy Assessment and Observation (EPAO) instrument is a tool developed to assess child care centres' nutrition and physical activity environments, policies and practices. It is administered by trained observers using direct observation and document review. It was developed to evaluate the '*Nutrition and Physical Activity Self-Assessment for Child Care*' intervention (Ward *et al.*, 2008b) and followed on from a study by Ball *et al.*, (2007) in which the development of an observation based tool for use in the determination of the amount and type of food served and eaten by children in the childcare setting was established. Use of the environment and policy assessment and observation instrument to determine intervention effect of the '*Nutrition and Physical Activity Self-Assessment for Child Care*' intervention determined no significant difference between control and intervention pre-schools in nutrition or physical activity environment measurements (Ward *et al.*, 2008a). The authors, note, that the reason for this is unclear and suggest a number of possible causes. The intervention was a low cost one which was introduced through the public health system. Requesting services to choose small areas of the environment to change, rather than requiring them to alter the whole environment, and the use of self assessment in the '*Nutrition and Physical Activity Self-Assessment for Child Care*' programme may also have affected the results achieved. As the Environment and Policy Assessment and Observation (EPAO) instrument was the first tool developed to specifically measure the nutrition and

physical activity environments of pre-school settings, it was hypothesised that insignificant results may have been due to the tool itself and suggested the need for further study in this regard.

Alkon *et al.*, (2008) describe their development of an health and safety checklist for use in the early years' setting: the California Childcare Health Programme (CCHP) Health and Safety Checklist. The checklist was developed by undertaking a literature review, identifying best practice or the gold standard of practice, consulting an advisory group and revising the checklist; and piloting the checklist. The checklist consisted of a number of criteria grouped into subscales and each criterion was rated on a 3 point scale of '*meeting, partially meeting or not meeting*' national standards. Face, content and construct validity and reliability were also established for the tool.

The '*ENHANCE (Encouraging Healthy Activity and Eating in Childcare Environments)*' pilot project was carried out with 72 childcare providers from 45 child care settings in the United States. Child care practices were measured using an observation tool the 'Protocol for Mapping Policies and Practices'; focus was on three areas: feeding practices; nutrition education and family communication. Providers were questioned regarding their knowledge and beliefs about their role in supporting healthy eating. Observation data and provider survey data were collected at baseline and one year post-intervention. The intervention consisted of a three hour training session with providers. Results demonstrated that a reduction in reported misconceptions was significantly associated with improved feeding practices, and that changes in reported efficacy and feeding knowledge had a significant role to play in changes observed in nutrition education and family communication (Lanigan, 2012).

Schwartz *et al.*, (2009) developed an instrument to measure school wellness policies from kindergarten to grade twelve. The aim was to: develop a coding system

for schools wellness policies to assess them for strength and comprehensiveness; and to score each policy to enable policies to then be compared. The tool consists of 96 items and evaluates 7 goal areas including: nutrition education; United States' standards for nutrition programmes and school meals; nutrition standards for all other available foods and beverages; physical education; physical activity; communication and promotion of nutrition and health; evaluation of health related activities. While the tool was described as a reliable and valid measure of school wellness policy quality, a limitation of the study was the impossibility of determining whether policy score assigned by the tool would predict the school environment or the student behaviours. Another tool, The Wellness Child Care Assessment Tool, is a 65-item measure of five areas of pre-school practice: nutrition education; food and beverage nutrition standards; healthy eating promotion; physical activity; communication and evaluation (Falbe *et al.*, 2011). One of the limitations of this tool was its inability to predict whether the scores attained predict the quality of the nutrition and physical activity environment and practice.

## **2.6 Conclusion**

This review of the literature has outlined the importance and role of optimal nutrition and health related practice in the pre-school aged child. With many children in society now being cared for outside the home environment, evidence exists denoting that the onus is on the childcare provider to ensure best practice is adhered to in relation to children's nutrition, physical activity and habit formation, and best practice guidelines for the childcare setting have been described in detail. While research experts have advocated the need for interventions to promote best practice in this setting, few

interventions in the setting would appear to exist in the literature with many of these focusing on curriculum change. Interventions that motivate change in practice and the environment have been reviewed and have informed the development of the intervention study described within this PhD thesis.

## **CHAPTER 3**

### **GENERAL METHODS, AIMS AND OBJECTIVES**

#### **3.1 Introduction**

This chapter outlines the overall aims and objectives of this study, the Healthy Incentive for Pre-schools' (HIP) project, together with the methods that are used in Chapters 4, 5 and 6. Specific details that are pertinent to a particular methodology will be described in more depth in the relevant chapters.

#### **3.2 Aims and objectives**

##### **3.2.1 Aim**

To develop a validated nutrition and health related evaluation tool for pre-schools and to determine whether evaluation supported by delivery of a specifically developed nutrition and health educational resource can promote improved food service, and nutrition and physical activity practices in the full day care pre-school setting.

##### **3.2.2 Objectives:**

- Devise and validate a Pre-school Health Promotion Activity Scored Evaluation Form for use in the pre-school setting which is based on the Food and Nutrition Guidelines for Pre-school Services (Department of Health and Children (Ireland))

2004) and relevant international best practice literature, and has the potential to be a motivational tool in a future incentive scheme.

- Carry out a pre-intervention audit of all full day care pre-schools registered with the Irish Health Service Executive, Dublin Mid-Leinster (Midland Area) using the Pre-school Health Promotion Activity Scored Evaluation Form.
- To randomly assign the pre-schools registered with the project to one of two parallel intervention delivery groups: a ‘manager trained’ group or a ‘manager and staff trained’ group.
- To develop a nutrition and health related Pre-school Education Resource Pack to accompany the Pre-school Health Promotion Activity Scored Evaluation Form, including appropriate support materials as identified in the Evaluation Form.
- To deliver training on the Pre-school Health Promotion Activity Scored Evaluation Form and the Pre-school Education Resource Pack to pre-schools registered with the Irish Health Service Executive, Dublin Mid-Leinster (Midland Area), ensuring adequate representation from disadvantaged pre-schools.
- To carry out an evaluation 6-9 months post-intervention using the Pre-school Health Promotion Activity Scored Evaluation Form to determine change in practice.
- To determine the views of pre-school managers regarding the type of incentive they would most favour for inclusion in a future incentive scheme.
- To write up the findings of the study and disseminate through peer review and submit for publication, and also submit a final Project Report to *safe food*.



### **3.3 Study hypothesis**

This study tests the hypothesis that ‘manager trained’ pre-schools i.e. where the manager only is trained show smaller improvements in nutrition and physical activity practice and food service provision, after a six to nine month period, than ‘manager and staff trained’ pre-schools, i.e. pre-schools randomised to receive a staff education session together with manager training.

### **3.4 Ethical considerations**

Ethical approval for this study was obtained from the Research Ethics Committees of the Health Service Executive Dublin Mid-Leinster (Midland Area) (**Appendix 1**) and the Dublin Institute of Technology (**Appendix 2**), upon submission of a written project protocol (**Appendix 3**).

Written informed consent was obtained prior to pre-intervention data collection from all pre-school managers participating in the project process; including consent for all follow-up. Written consent forms, and project information sheets, were provided to those participating in both the pilot phase (phase 1) (**Appendix 4 & 5**) and in the main study (**Appendix 6 & 7**). Anonymity was assured at all times with each pre-school being supplied with a code which would represent it throughout the project process. When inputting data, pre-school identification and data details were kept separately.

### 3.5 Research design

The Healthy Incentive for Pre-schools project was designed to assess two methods of delivering an intervention to pre-schools offering a full day care service, defined as the provision of care for children aged 3 months to 5 years for greater than 5 hours per day (Department of Health and Children (Ireland), 2006). A National Advisory Group was created to advise and monitor the progress of the Healthy Incentive for Pre-schools project. The National Advisory Group consisted of representatives from a number of different agencies: **safefood**; Healthy Food for All; Early Childhood Ireland, Dublin Institute of Technology and the Health Service Executive. The National Advisory Group met each year on two occasions, March and October, from 2008 to 2012.

Three preparatory research studies (2006-2007) were undertaken prior to commencement of the main Healthy Incentive for Pre-schools project process. These studies were overseen by a Local Expert Group, multidisciplinary in nature, comprising of Health Service Executive Dublin Mid-Leinster (Midland Area) personnel with a remit for pre-schools (community dietitians, pre-school services' personnel, environmental health officers, public health nurses). Findings from these three preparatory research studies informed the development of the Healthy Incentive for Pre-schools project and the draft Pre-school Health Promotion Activity Scored Evaluation Form which was further modified in preparation for pilot phase testing in 2008.

The project itself commenced with a pilot phase (phase 1) and progressed to that of a simple randomised parallel group study (phases 2-8). Adherence to the time frame specified in the study design was achieved. Random assignment in studies is a preferred method for research studies with the biggest advantage to researchers being its prevention of selection bias (Moher *et al.*, 2010). The project data collection

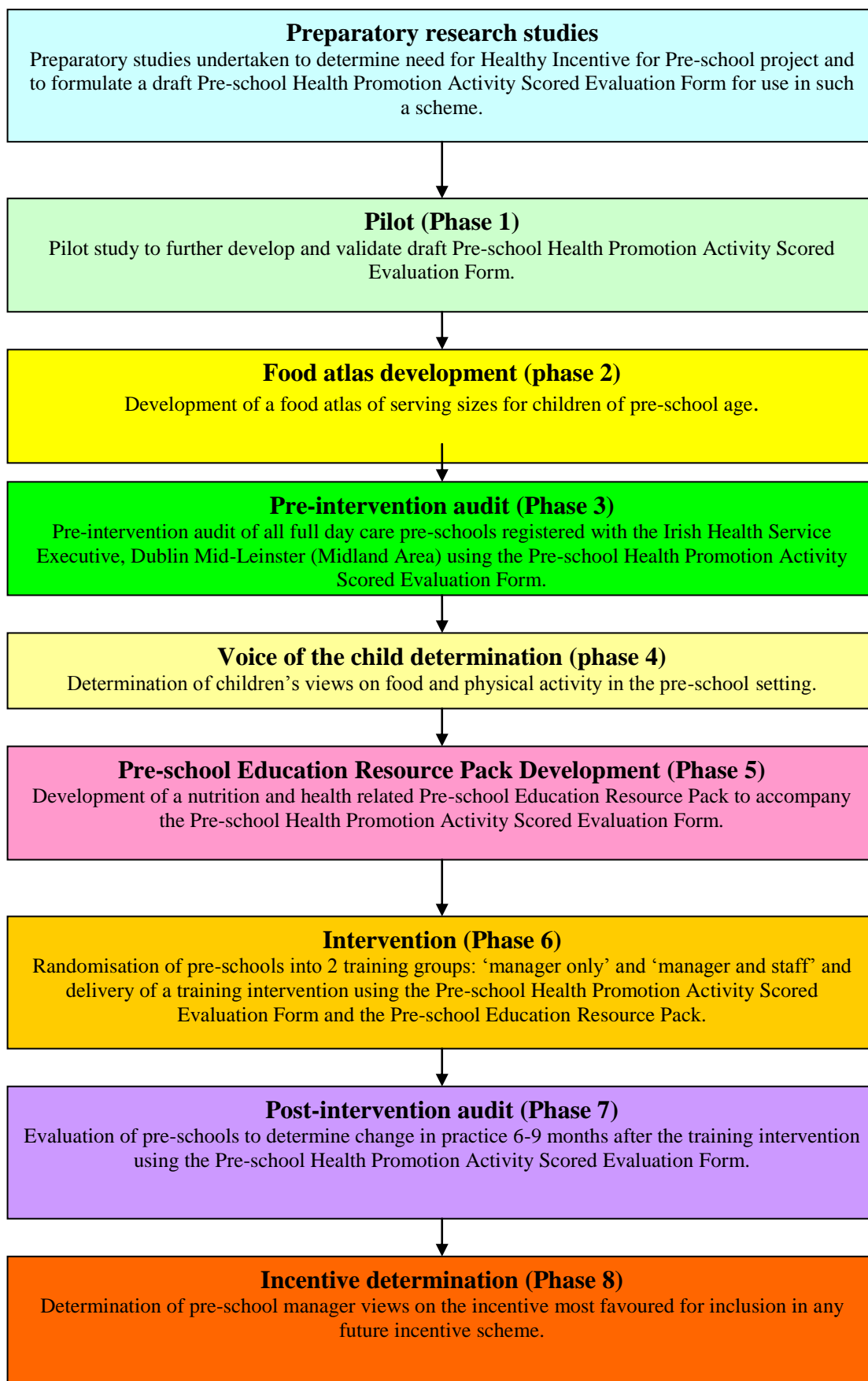
commenced in the summer of 2008 and was completed in the spring of 2012 and comprised of a number of different phases:

- The pilot (phase 1) data collection occurred in June and July 2008 using the draft Pre-school Characteristic Collection Form (**Appendix 8**), Pre-school Detailed Assessment Tool (**Appendix 9**) and Pre-school Health Promotion Activity Scored Evaluation Form (**Appendix 10**).
- The ‘food serving size atlas’ development (phase 2) took place during September and October 2008.
- Phase 3 provided pre-intervention data on pre-school characteristics and nutrition and health related practice in all pre-schools that provided a full day care service; centring on: the environment, food service, meals and snacks. Data collection in phase 3 commenced in November 2008 using the modified and finalised: Pre-school Characteristic Collection Form (**Appendix 11**), Pre-school Detailed Assessment Tool (**Appendix 12**) and Pre-school Health Promotion Activity Scored Evaluation Form (**Appendix 13**). Data were collected during school term time to ensure maximum child and staff attendance at each pre-school. Phase 3 data collection was completed in November 2009.
- The ‘voice of the child’ (phase 4) occurred from July to October 2009.
- Phase 5 (January - July 2010) involved the development of a Pre-school Education Resource Pack based on the educational needs of the pre-school providers which were identified from the phase 3 data collected.
- The intervention phase (phase 6) commenced in July 2010 and was completed in February 2011.
- Phase 7 post-intervention data collection commenced in mid-September 2011 and was completed at the end of November 2011.

- A further and final phase involved the determination of pre-school managers' opinions on incentives they wished to see included in the project in the future (phase 8) (see **chapter 6**), using the Delphi Technique. This phase commenced in December 2011 and was completed in April 2012.

**Figure 3.1** outlines the different phases of the Healthy Incentive for Pre-schools project.

**Figure 3.1 Flow diagram of HIP project**



## **3.6 Pre-school Health Promotion Activity Scored Evaluation Form development**

The development process for the Pre-school Health Promotion Activity Scored Evaluation Form involved a series of steps to ensure its validation. The draft form was originally derived in three preparatory research studies undertaken prior to the instigation of the Healthy Incentive for Pre-schools project. To provide insight into the development process of the Pre-school Health Promotion Activity Scored Evaluation Form, these preparatory research studies will now be described.

### **3.6.1 Healthy Incentive for Pre-schools project preparatory studies**

#### ***3.6.1.1 Preparatory study A***

In 2004, an initial study was undertaken to explore the feasibility of an healthy food incentive scheme in the pre-school setting in the midlands region (Johnston *et al.*, 2007) (**Appendix 14**). A structured telephone questionnaire was used to obtain the views of the Health Service Executive's pre-school multidisciplinary Local Expert Group and pre-school providers (*n* 17) on an healthy food incentive scheme. The Local Expert Group questioned included: environmental health officers (*n* 4); public health nurses (*n* 2); pre-school training officer (*n* 1); child minding advisory officers (*n* 4); and the pre-school services manager (*n* 1); the role of the group was to oversee nutrition interventions in the pre-school setting. The pre-school providers were predominantly the care assistants directly involved with the daily care of the children.

All members of the Local Expert Group favoured the introduction of an incentive scheme, suggesting that it would facilitate nutrition education and act as an

incentive for the implementation of healthy food policies in pre-schools. All the pre-school providers interviewed also supported the introduction of an incentive scheme, but identified lack of time and poor understanding of children's healthy eating as the main barriers to implementing healthy eating policies.

Although all respondents supported an healthy food incentive scheme in principle, barriers to implementation of healthy eating and participation in an incentive scheme were highlighted. The support mechanisms identified by the pre-school providers to ensure participation in such a scheme and an evaluation of the effectiveness of the scheme needed to be further investigated.

### ***3.6.1.2 Preparatory study B***

Following on from the work in preparatory research study A, the Local Expert Group advised that the meals and snacks being provided by pre-schools and parents of pre-school children, in the Midlands, should be investigated as this had never been undertaken previously. Commitment by pre-schools to participation in a future nutrition incentive scheme was also needed. A structured telephone questionnaire was used to obtain the views of pre-schools based in the midland region on commitment to an incentive scheme and to determine reported practice in this setting (*n* 89) (Johnston Molloy *et al.*, 2007) (**Appendix 15**).

Seventy-three of eighty-nine pre-schools registered with the Health Service Executive Dublin Mid-Leinster (Midland Area) completed the questionnaire. Sixty-seven pre-schools reported that they provided food, with 48 pre-schools stating that parents provide some food. Whilst sixty-three noted that they had an healthy food policy, only forty-two said they had created it in conjunction with the Food and

Nutrition Guidelines for Pre-school Services (Department of Health and Children (Ireland), 2004) and only forty-three had a policy on food brought in by parents.

When asked to rate the idea of a nutrition incentive scheme on a Likert scale (1, poor; 10, excellent), the majority of participants gave scores of 8–10. Most pre-school providers (*n* 64) said that they would sign up for such an incentive scheme and cited many benefits. With the positive commitment of the majority of service providers to an healthy food incentive scheme, it was then necessary to develop and validate a tool that could be used in the preschool setting to assess practice and to motivate change, if needed.

### ***3.6.1.3 Preparatory study C***

This preparatory research study aimed to evaluate preschool nutrition practices, using a draft Pre-school Health Promotion Activity Scored Evaluation Form that was based on agreed best practice and was created by the Local Expert Group. Nineteen pre-school childcare facilities in the counties Laois and Offaly were invited to take part in an evaluation of their current nutritional practices using the draft Pre-school Health Promotion Activity Scored Evaluation Form devised (Molloy *et al.*, 2007) (**Appendix 16**). The aims of preparatory research study C were to determine if the draft Pre-school Health Promotion Activity Scored Evaluation Form devised was user friendly, understandable and practical; whether it was successful as a motivational tool; the time required to carry out the evaluation; problems associated with the evaluation from the perspective of the childcare facility; and the weighting of the scores assigned to each criterion within the evaluation.

The evaluation was administered by first observing mealtime practices during the main meal of the day. The researcher then went through each criterion on the list



with the owner or manager to get their feedback. The feedback focused on four main areas i.e. whether each criterion was fully understood; did staff agree with a need for improvement as part of each criterion; exploring the feasibility of implementing improvements in each criterion area; and any issues regarding resources and staffing for each criterion.

The results demonstrated that the majority of facilities wanted more information on each criterion listed in the draft Pre-school Health Promotion Activity Scored Evaluation Form. The information requested included: the rationale for each criterion being considered best practice; how meeting the criterion might benefit the pre-school facility and the children attending it, and examples of how best to implement each criterion.

It was noted that within many pre-school facilities there was no, or little comprehension of the need for change, e.g. why a written healthy eating policy would be of benefit. However, when the reason for the criterion on the draft Pre-school Health Promotion Activity Scored Evaluation Form was explained, most facilities reported an eagerness to alter their practice. The need for information on nutrition and healthy eating was also identified. Finally, it was noted that the scoring system used in the draft Pre-school Health Promotion Activity Scored Evaluation Form needed further modification and a Pre-school Education Resource Pack to accompany the finalised Pre-school Health Promotion Activity Scored Evaluation Form was needed to support pre-schools in achieving changes in practice. The effectiveness of regular pre-school evaluation, supported by appropriate education on behaviour change in the setting needed to be assessed.

Completion of the preparatory research studies informed the development of the Healthy Incentive for Pre-schools project, in which the research work schedule was divided into eight distinct phases (**Figure 3.1**).

### **3.6.2 Pre-school Health Promotion Activity Scored Evaluation Form modification and validation**

Following completion of the Healthy Incentive for Pre-schools project preparatory studies, the draft Pre-school Health Promotion Activity Scored Evaluation Form was modified and its validity was determined through a number of recommended steps (Ammerman *et al.*, 2007; Benjamin *et al.*, 2007b; Alkon *et al.*, 2008; Falbe *et al.*, 2011).

Each criterion on the draft Pre-school Health Promotion Activity Scored Evaluation Form (**Table 3.1**) was checked to ensure no overlap between, or within, criteria existed. A comprehensive review of the scientific literature was undertaken with regard to each criterion on the draft Pre-school Health Promotion Activity Scored Evaluation Form. This was carried out in order to compare all aspects of the form to the published literature; to ensure that the form measured best practice and to establish face and content validity. Best practice was then defined for each criterion on the draft Pre-school Health Promotion Activity Scored Evaluation Form through the development of 'best practice criterion standards'. The draft Pre-school Health Promotion Activity Scored Evaluation Form was broken down into subsections for ease of use; this included sections on: the environment (all ages); weaning (6-12 months only); weaned children (over 12 months); and snacks for weaned children (over 12 months). Each section contained six 'best practice' criteria.

An altered scoring system was devised based on the literature (Benjamin *et al.*, 2007a; Alkon *et al.*, 2008); following the literature review, the original scoring system used in the preparatory research studies was revisited and the scoring system for each criterion was changed from a yes/ no system to a ‘three way’ value system (0; 1; 3). Services would be able to attain one of three possible scores: ‘does not meet standard’ (zero points scored); ‘partially meets standard’ (one point scored); ‘completely meets standard’ (three points scored) for each criterion measured. A classification range for the scoring system was determined: Participation (Score 0-24); Bronze (Score 25-49); Silver (Score 50-74), Gold (Score 75-99); Platinum (Score 100-120). This was based on a pre-school with children of all ages having to attain at least 20% of the total potential score to attain a Bronze level classification, at least 40% to attain a Silver classification, at least 60% to attain a Gold level and at last 80% to attain a Platinum level. Reliability of scoring was defined as achieving a score within the same range – i.e. Gold, Silver. Etc.

Comparison was made between the draft Pre-school Health Promotion Activity Scored Evaluation Form and the standardised national inspection tool (Department of Health and Children (Ireland), 2006) used by the Pre-school Inspection Team to ensure there was no overlap between the two tools. Drafts of the Pre-school Health Promotion Activity Scored Evaluation Form were sent to Pre-school Inspection Team members and Local Expert Group members throughout its development phase. The National Advisory Group and Local Expert Group reviewed the draft Pre-school Health Promotion Activity Scored Evaluation Form to determine construct validity. The National Advisory Group discussed each subscale and individual criterion to establish reliability.

The Pre-school Inspection Team was requested to use the draft Pre-school Health Promotion Activity Scored Evaluation Form during one pre-school inspection visit. In preparation for this visit, a multiple choice questionnaire (**Appendix 17**) was developed in order to determine the Inspection Team's knowledge level, and possible training needs, prior to their use of the draft Pre-school Health Promotion Activity Scored Evaluation Form; this questionnaire contained a series of questions, related to nutrition and health practice; each question having three separate answers, one correct, based on best practice, and two incorrect answers. An information session, based on needs identified from administration of the multiple choice questionnaire, was then provided to the Pre-school Inspection Team. Following their use of the draft Pre-school Health Promotion Activity Scored Evaluation Form during one inspection visit, the Team's views and feedback were collected on its practical use. The reliability was further tested and moderate to strong correlations were observed between the items included in the four subscales. The Cronbach's  $\alpha$  coefficient for the overall Form was .86 (showing a strong correlation among the 24 criteria on the form).

It was planned that inter-rater validation would be undertaken in two ways in this study: through pre-school providers undertaking self-assessment and by members of the Pre-school Inspection Team administering the draft Pre-school Health Promotion Activity Scored Evaluation Form with pre-schools that had been evaluated by the researcher. While self-assessment was undertaken by the majority of pre-school providers ( $n$  30), it was not possible for members of the Pre-school Inspection Team to undertake an assessment during their routine inspection visits.

### ***3.6.2.1 Development of additional data collection tools***

Pertinent background information and characteristics of the pre-schools and their populations were collected using a specially developed draft Pre-school Characteristic Collection Form (**Appendix 8**). This form aimed to gather information on: number of children and staff; food provided by the pre-school, and timing of meals and snacks.

To ensure that all observations could be recorded during a pre-school visit it was determined that a tool should be developed to enable collection of all relevant observation data. This tool would then be used during pre-school visits in tandem with the Pre-school Health Promotion Activity Scored Evaluation Form.

The tool developed, the draft Pre-school Detailed Assessment Tool (**Appendix 9**), and its content mirrored that of the draft Pre-school Health Promotion Activity Scored Evaluation Form. Each criterion from the draft Pre-school Health Promotion Activity Scored Evaluation Form was evident on the draft Pre-school Detailed Assessment Tool and each criterion was accompanied by a series of questions especially designed to allow collection and extrapolation of relevant information, to ensure that sufficient evidence was gathered to enable the assignment of the criterion score.

The criterion scores achieved during each pre-school visit were based on the observations made and recorded on the draft Pre-school Detailed Assessment Tool, and on subsequent comparison of these to the 'best practice criterion standards' developed for the project. An 'overall' Healthy Incentive for Pre-schools project score was then assigned to each pre-school service by totalling all criterion scores on the draft Pre-school Health Promotion Activity Scored Evaluation Form. In essence the draft Pre-school Detailed Assessment Tool was used to establish criterion validity of the Pre-school Health Promotion Activity Scored Evaluation Form through the collection of more detailed information on each criterion.

**Table 3.1 Criteria on the draft Pre-school Health Promotion Activity Scored Evaluation Form (pilot phase 1)**

<b>Pre-school Health Promotion Activity Scored Evaluation Form sections</b>	<b>Pre-school Health Promotion Activity Scored Evaluation Form scored criteria</b>
Environment	Whole school policy Healthy reward scheme Education activities Planned physical activity Outside in the day Praised for eating
Children under 12 months	Consistency of weaning foods Weaning food appropriate Feeding selves encouraged Iron rich foods Drinks for infants Unlidded cup
Children over 12 months	Providers sitting with children Help when eating Protein portion at main meal Starch portion at main meal Dairy portion at main meal Vegetables portion at main meal
Snacks	Fruit as snack Water with meals & snacks Water between meals & snacks Only milk or water offered Milk offered other times during day Snacks low in fat and sugar only

### **3.6.3 Pilot study (phase 1)**

Practical validation of the draft Pre-school Health Promotion Activity Scored Evaluation Form involved the testing of its use in a pilot sample of pre-schools, providing a full day care service, in a geographical area outside the area to be assessed in the main Healthy Incentive for Pre-schools project.

#### ***3.6.3.1 Pilot (phase 1) sample selection and recruitment***

In the pilot (phase one) all eligible pre-schools, providing a full day care service, in one county (Wicklow) (*n* 34), were contacted to take part in the pilot study. A list of eligible pre-schools was obtained from the Community Nutrition and Dietetic Service of the Health Service Executive Dublin Mid-Leinster (Eastern Area) in Bray, Co.

Wicklow. Pre-schools with any previous contact with the Health Service Executive Dublin Mid-Leinster Community Nutrition and Dietetic Service (Midland Area) which was carrying out the study, were excluded. A detailed letter outlining the project was sent out jointly from the Community Nutrition and Dietetic Services of the aforementioned geographical areas (**Appendix 18**). Each service was followed up by telephone, within 2 weeks, to discuss the proposed project and to arrange a pre-school visit. Upon confirmation of a visit date, a further confirmation letter was sent to the relevant pre-school (**Appendix 19**). Permission to carry out the study in each pre-school was initially obtained by telephone; written informed consent was also received from each pre-school manager, on the day of the study visit, before commencement of the study. Thirty-five per cent ( $n$  12) of those pre-schools contacted agreed to partake in the study and allow pre-school data collection visits.

#### ***3.6.3.2 Pilot (phase 1): draft Pre-school Health Promotion Activity Scored Evaluation Form administration***

Data were collected in each pre-school service using direct observation, noted as the gold standard for accuracy in measuring food in childcare (Gittelsohn *et al.*, 1994). Appointments to visit were made with each pre-school provider, at least two weeks in advance. One full day was spent in each pre-school carrying out observation of all aspects of food and nutrition and health related practice. Characteristics and background information were collected on each pre-school at the beginning of the visit, using the draft Pre-school Characteristic Collection Form referred to in **section 3.6.2.1**. Meal and snack times were noted. Food and fluid given; serving sizes provided; the eating environment established for children; and physical activity practices undertaken in each service were observed and documented using the draft Pre-school Detailed

Assessment Tool referred to in **section 3.6.2.1** Each criterion on the draft Pre-school Health Promotion Activity Scored Evaluation Form was subsequently completed using this accompanying documentation and an ‘overall’ score on the draft Pre-school Health Promotion Activity Scored Evaluation Form was assigned to each pre-school visited.

### ***3.6.3.3 Modifications to draft Pre-school Health Promotion Activity Scored Evaluation Form resulting from the pilot (phase 1)***

Based on the pilot (phase 1) findings (Johnston Molloy *et al.*, 2011) (**Appendix 20**), further adjustments were deemed necessary to prepare the draft Pre-school Health Promotion Activity Scored Evaluation Form (**Appendix 10**) for use in the pre-intervention data collection phase. All revisions made were reviewed by the Local Expert Group and the National Advisory Group.

These draft Pre-school Health Promotion Activity Scored Evaluation Form revisions involved the modification of the four ‘section’ headings so that the four ‘sections’ would pertain to all age groups within the pre-school setting (Johnston Molloy *et al.*, 2011). Although many pre-schools had no children aged less than 12 months, it was observed that a number of issues which should be only relevant to children aged less than 12 months were also pertinent to those over 12 months of age i.e. provision of: age appropriate consistencies; iron rich food; two handled un-lidded beaker; chair versus high chair; or self feeding versus being fed.

A number of criteria in each ‘section’ were also altered based on the results of the pilot study so that each ‘section’ would include six separate criteria (**Table 3.2**). During the pilot study, poor ‘family style food service’ practice was observed with meals tending to be rushed, children being told to hurry up, cleaning taking place, and children leaving the table and being allowed to play while other children were still



eating. Inadequate time for meals or snacks; poor self service and inadequate provision of age appropriate cutlery, plates or drinking vessels for infants and children were also observed. Therefore, the inclusion of criteria that measured ‘family style food service’ was deemed to be necessary.

The phrasing of some criteria needed alteration to avoid misinterpretation, for example, the necessity to indicate quantity i.e. a glass / portion / 200 mL milk. The provision of plates, cutlery and bottles needed to be assessed in all age groups. Certain criteria needed to be excluded as it was not possible to observe and record their practice adequately, i.e. hand washing by staff, or because the recording of data was too subjective i.e. the provision of praise by the childcare provider.

Slight adjustment was made to the terminology of scoring following the pilot study: ‘no score’ (zero points scored), ‘minimum standard’ (one point scored) and ‘best standard’ (three points scored). Due to these modifications and to enable further strengthening of the classification system, the classification range for the scoring system was revised and determined as: Participation (score 0-19), Bronze (score 20-39), Silver (score 40-54), Gold (score 55-64) and Platinum (score 65-72). In order to achieve a classification, it was necessary for a pre-school to attain at least 25% of the potential scores (Bronze), 50% of the potential scores (Silver); 75% of the potential scores (Gold) or over 90% of the potential scores (Platinum).

Additional issues noted during the pilot study were the need to directly observe the plating of food, before distribution, to allow determination of serving sizes accurately. It was apparent that pre-school providers needed education on serving sizes appropriate for pre-school children of different ages if it was hoped to change current practice. The development of a food serving atlas and a list of household measures for serving sizes were recognised as necessary components of an educational resource to

accompany the finalised Pre-school Health Promotion Activity Scored Evaluation Form.

**Table 3.2 An outline of the finalised Pre-school Health Promotion Activity Scored Evaluation Form and criteria**

<b>Pre-school Health Promotion Activity Scored Evaluation Form sections</b>	<b>Pre-school Health Promotion Activity Scored Evaluation Form scored criteria</b>
Environment	Whole pre-school health policy Education related activities Planned physical activity Outside playtime Evidence of food use as reward / treat
Food service	Appropriate number of meals and snacks Staff sitting with children at food times Staff eating same food as children at food times Practice of 'family style food service' Adequate allocation of time for food times Adequate encouragement & appropriate self feeding Age appropriate feeding & drinking utensil use
Meals	Appropriate serving of protein at main meal Appropriate serving of starch at main meal Appropriate serving of dairy at main meal Appropriate serving of vegetables at main meal Meals offered in self-service style Iron rich food provision at main meal
Snacks	Fruit at least once other than main meal Foods offered from top shelf of Food Pyramid Dairy food at least once other than main meal Tap water and milk only with snacks Tap water, milk or appropriately diluted juice with meals Tap water or milk offered between meals and snacks

The draft Pre-school Characteristic Collection Form (**Appendix 8**) and draft Pre-school Detailed Assessment Tool (**Appendix 9**) (**section 3.6.2**) were also further modified after the pilot phase (phase 1), to reflect the changes made to the draft Pre-school Health Promotion Activity Scored Evaluation Form and to gather other important and relevant characteristic information i.e. detailed information on food provided by parents; childcare fees; cost of food; participation in state schemes such as the school milk scheme; menu types; policies relating to health; and education resources used.

The pilot (phase 1) was important as it highlighted the further changes that needed to be made to the draft Pre-school Health Promotion Activity Scored Evaluation Form before pre-intervention data (phase 3) collection could commence.

### **3.7 Food atlas development (phase 2)**

From the pilot (phase 1) work carried out (Johnston Molloy *et al.*, 2011) (**Appendix 20**), the use of a collection of pictures of recommended food servings for pre-school age children was recognised as necessary to determine the adequacy of food servings being provided by childcare providers, particularly if that resource was accompanied by a reference guide containing weights of foods and accompanying household measurements of these foods.

The United States Department of Agriculture (USDA) (United States Department of Agriculture, 1999) noted that the use of household measures, such as cups or spoons or common objects, to measure food for the pre-school age child would aid parents in determining portion sizes, whilst Bish *et al.*, (2005) reported that the provision of visual examples of recommended portion sizes of common food to parents increased their understanding of these portion sizes.

These recommendations reflect the confusion that exists amongst the general public regarding the amount of food that is considered to be a food ‘portion’ or a food ‘serving’; many are unsure as to the difference between the two terms and have their own idea of what constitutes a ‘standard portion’ (Hogbin & Hess, 1999). However, Nelson & Haraldsdóttir (1998a) have defined a ‘portion’ as the ‘*amount eaten on any one occasion (first plus subsequent helpings)*’ and a ‘serving’ as the ‘*amount of food served in a single helping*’.

Although there is a food portion size photographic atlas for adults (Nelson *et al.*, 2002), no such tool depicting recommended children's serving sizes was available in the published literature at that time. Practical guidelines for the development of a food portion size photographic atlas have been outlined (Nelson & Haraldsdóttir, 1998a). These guidelines define a 'photographic atlas' as a '*photograph series (set of photographs depicting different amounts of a particular food) usually bound together in a single volume*'.

The process that was undertaken to develop the food serving size atlas (Johnston Molloy *et al.*, 2010) (**Appendix 21**) for the pre-school age child will now be outlined.

### **3.7.1 Determination of food servings**

Photographs of a wide variety of foods recommended for pre-school children's meals and snacks (*n* 344) (Department of Health and Children (Ireland), 2004; Irish Health Service Executive, 2004; Crawley, 2006) were taken during the preparation of the food serving size atlas. These included photos of 'individual' foods (*n* 205) and 'composite' foods (*n* 139).

The 'individual' foods photographed included starchy foods (*n* 57); protein foods (*n* 63); dairy foods (*n* 17); fruit (*n* 68); and vegetables (*n* 18). An 'half serving', 'serving' and a 'serving and an half' of every food type was weighed separately. The serving sizes of all common 'individual' foods were determined using the Irish Food and Nutrition Guidelines for Pre-school Services (Irish Health Service Executive, 2004). If any common food serving size was unavailable in the Irish guidelines, food serving size information was obtained from The Caroline Walker Trust Guidelines (UK) for the childcare setting (Crawley, 2006). An 'half serving' measure of each common

food was obtained by dividing its ‘serving’ measure in half; while a ‘serving and an half’ measure was determined by multiplying the ‘serving’ measure by 1.5.

The composite foods in the Irish Health Service Executive’s ‘3 week menu plan – a resource for pre-schools’ (Irish Health Service Executive, 2004) (*n* 141) were prepared and cooked using the recipes recommended for use in Irish pre-schools by the Irish Health Service Executive (Irish Health Service Executive, 2004). To determine the serving sizes for the composite dishes, each recipe in the ‘3 week menu plan – a resource for pre-schools’ (Irish Health Service Executive, 2004) was individually prepared. Each recipe in this resource is based on the nutrient requirements of children aged 1½ to 3 years. Each recipe outlines three sets of ingredients; an ingredients list to make 10, 20 and 30 servings. For the preparation of foods for the food serving size atlas, the ingredients list required to produce 10 servings of the food recipe was used.

### **3.7.2 Weighing of foods**

An electronic kitchen scales (Bifinett Electronic Kitchen Scale, Model No: KH 1156; Germany) was used to weigh all foods and cooking utensils. The weight of the cooking utensil used was obtained prior to the preparation of each recipe. When ‘10 servings’ of the recipe had been cooked, this food together with the cooking utensil in which it was cooked was again weighed. The weight of ‘10 servings’ was then determined by subtracting the cooking utensil weight from that of the cooking utensil and food weight. When the food weight was obtained, this was divided by ten to obtain the weight of one serving. This ‘serving’ weight was recorded. This ‘serving’ weight was divided in half to get the weight of ‘an half serving’. The ‘serving’ weight was multiplied by 1.5 to get the weight of ‘one and a half servings’.

Using the weights obtained for each food serving size, an appropriate household measure was then determined and recorded for each food recipe. A variety of different household utensils were used: tablespoons; serving-spoons; dessertspoons; ladles; cups and glasses.

### **3.7.3 Plating of each food serving**

When the food serving size was determined, each food serving size: ‘an half serving’; ‘a serving’ and ‘a serving and an half’ was placed individually on a standard plate. Each serving size was then photographed individually. The same plate was used for the plating of all serving sizes in the food atlas development process.

### **3.7.4 Digital images**

All foods that were cooked and plated were photographed using a digital camera (Sony Cyber shot DSC P200; Sony Corporation of America, New York). The methodology was based on that used by Nelson & Haraldsdóttir (1998b), Williamson *et al.*, (2003) and Martin *et al.*, (2007). The camera was mounted on a tripod. The tripod height was 60 cm and the camera angle was at 45 degrees from the plate. A reference point was designated on the table and the same standard plate was replaced on this point after each meal or food change.

## **3.8 Pre-intervention data collection (phase 3)**

### **3.8.1 Sample population**

In this study, convenience sampling of pre-schools was undertaken; recruitment was focussed within a specific geographic area and subjects chose to participate when contacted by letter, rather than being randomly selected (Boushey *et al.*, 2008). A list of all pre-schools offering a full day care service that were eligible to participate in the project ( $n = 100$ ) was obtained from the Pre-schools' Service of the Health Service Executive Dublin Mid-Leinster (Midland Area). The Health Service Executive Pre-schools' Service deemed pre-schools ineligible to participate if they were not in substantial compliance with the Childcare (Pre-school Services) (No2) Regulations 2006 (Department of Health and Children (Ireland), 2006), the European Communities (Hygiene of Foodstuffs) Regulations 2006 (Government of Ireland, 2006), or the Public Health (Tobacco) Acts 2002 (Government of Ireland, 2002) and 2004 (Government of Ireland, 2004); if they were not registered as food premises with the Health Service Executive; if they had not had an inspection by the Pre-school Inspection Team subsequent to notification of the service to the Health Service Executive, or if they did not have a potable water supply. In addition the Pre-school Inspection Team outlined that to be eligible pre-schools should not be '*subject to outstanding issues*' under investigation by a separate Health Service Executive Department, and that the ongoing process of inspection and monitoring could influence a pre-school's continued participation in the incentive scheme, depending on a pre-school's compliance with the national pre-school regulations (Department of Health and Children (Ireland), 2006).

### 3.8.2 Recruitment

In May 2008, the Community Nutrition and Dietetic Service and the Pre-schools' Service sent a joint letter to each eligible pre-school (**Appendix 22**) inviting them to apply to participate in the project. The letter included a 'tear off' section which enabled pre-schools to apply by providing their name and contact details. Due to a low response rate (40%) to this invitation, a further letter was sent in early September 2008 to those pre-schools who had not responded. This was followed with visits to non-responding pre-schools in September and October 2008 to encourage more pre-schools to participate. A list of pre-schools applying for participation was sent to the Pre-school Service and Pre-school Inspection Team to ensure that all pre-schools remained eligible. Of the 100 pre-schools eligible to participate in the project, 76 pre-schools applied. Four were deemed ineligible by the Pre-school Inspection Team, ten did not respond and ten did not wish to participate.

In November, a joint letter from the Community Nutrition and Dietetic Service and Pre-schools' Service (**Appendix 23**) was sent to all pre-schools informing them that project visits would commence in late November 2008 and would continue into 2009; a short explanation of the visit was given and services were informed that they would be telephoned at least 2 weeks prior to their visit to arrange a convenient visit date and time. Due to the time lapse between the initial invitation to apply and commencement of pre-intervention data visits, there was a fall in pre-schools progressing with the project for a number of reasons: change in their circumstances and felt they could not participate (*n* 9); deemed ineligible by the Pre-school Inspection Team (*n* 4); premises closure (*n* 1). Pre-intervention data collection visits took place in 62 pre-schools across the midland region. As a result of issues that only became apparent during data collection visits, data from 4 of the pre-school visits were excluded from the pre-



intervention database; these were data from services that did not provide written consent ( $n = 2$ ); did not provide a main meal as no children remained in the service at main meal time ( $n = 1$ ); provided care only for children with intellectual disabilities ( $n = 1$ ).

### **3.8.3 Observation data collection**

Pre-intervention (2008) data were collected in the midland pre-schools by one Research Dietitian using the specially designed evaluation tools. Each service was contacted by telephone at least two weeks in advance to arrange a convenient time and date to visit; written confirmation of visit details was subsequently sent to each service. Each pre-school visit began approximately forty-five minutes to one hour before the first food service time in that pre-school. Detailed pre-school characteristics were collected from each pre-school manager using the specifically designed Pre-school Characteristic Collection Form (**Appendix 11**).

To obtain an aggregate picture of practice data collection occurred across all days of the week (Monday to Friday). Data were collected in each pre-school service on one day only. Each meal and snack time was observed. This involved spending time in the kitchen before the meal / snack time to determine the food serving size of the food being plated; if this was the practice in the service. A description of all foods offered was recorded using household measures. A photographic food atlas developed specifically for the Healthy Incentive for Pre-schools project (**section 3.7**), was used to aid data collection (Johnston Molloy *et al.*, 2010) (**Appendix 21**).

Practice was observed in each room of the service, regarding foods and fluids served; the meal time experience for children; staff / child interaction during the food time; and the room environment. Physical activity and outdoor time practice were also observed and recorded. All observations were detailed on the Pre-school Detailed

Assessment Tool (**Appendix 12**). Pre-school Health Promotion Activity Scored Evaluation Form (**Appendix 13**) criterion scores achieved during each pre-school visit were based on observations made and comparisons of these to the ‘best practice criterion standards’ developed for the project. The score for each ‘section’, as well as the ‘overall’ score, were then calculated and the ‘overall’ score used to classify each pre-school into either a Participation, Bronze, Silver, Gold or Platinum category.

### **3.9 Determination of the ‘voice of the child’ (phase 4)**

Children have traditionally been viewed as the objects of research; with research being carried out *on*, rather than *with* them (Neill, 2010). While in recent times children have been noted to be ‘active beings’, this does not always seem to translate into action when research with children is being considered (Balen *et al.*, 2006). The last decade has seen an increase in the literature highlighting the need for ‘voice of the child’ research (Department of Health and Children (Ireland), 2000; Greene & Hogan, 2005). In line with this, the National Advisory Group for the Healthy Incentive for Pre-schools project recommended an investigation to provide insight into children’s perception of food.

In preparation for direct research with children on the topic of food preference, a pre-study exercise was carried out to determine how best to capture the opinions young children have about food. To this end, two different symbolic systems were examined. This indicated that children seemed to understand a set of three smiley hedonic symbols from Microsoft Clip Art; correctly identifying the smiley symbols. However, when presented with a set of five facial hedonic symbols, described by Chen *et al.*, (1996), they had difficulty explaining the meaning of the different symbols.

The present study phase aimed to determine the perception of foods expressed by a sample of pre-school children, attending full day care service, (aged three to four years) provided by pre-schools enrolled in the Healthy Incentive for Pre-schools project.

### **3.9.1 Ethical issues**

Ethical approval for the voice of the child study was sought from the Research Ethics Committees of the Health Service Executive Dublin Mid-Leinster and the Dublin Institute of Technology. While ethical approval was granted by the Research Ethics Committee of the academic institution, the health services' research ethics committee noted that ethical approval would only be granted if two conditions were met; firstly, that only a specific set of hedonic symbols from the literature could be used Chen *et al.*, (1996); and secondly, that parental consent was obtained from both parents of each child that was to take part in the process. Co-ordination between dual ethics committees at a management level may have prevented this variance in approval from occurring; however, there was no co-ordination in place and, therefore, the research dietitian believed she could only proceed with the research by following all the conditions laid down by both committees.

### **3.9.2 Sample population**

Healthy Incentive for Pre-schools project pre-schools which had been visited previously by the researcher (*n* 48) were excluded from the sampling process as such visits may have had an influence on practice and children's views in these settings. The remaining pre-schools (*n* 15) were divided according to the number of children attending the full day care service and their deprivation score (Small Area Health Research Unit, 2006).

Each service identified in the sampling process was contacted by telephone. A verbal explanation of the ‘voice of the child’ process was detailed. Settings were advised, that informed pre-school manager and two-parent consent would be necessary. Information and consent forms were sent to each pre-school manager, at least one month prior to the arranged visit date. A follow up telephone call was made to each manager, just prior to the scheduled visit, to confirm visit details and ensure that parental consent had been obtained.

### **3.9.3 Data collection**

A schedule of questions and pictures relating to food was developed; the pictures used were a collection gathered from Microsoft Clip Art, specifically for this study.

The researcher met with a small group of three to four children in their settings. Children were not taken from their pre-school room, but were asked to move as a group to one side of the room. When in the group with the researcher, the children were shown the pictures of different foods and food situations; questions about the pictures were asked, and children requested to point to hedonic symbols (Chen *et al.*, 1996) to answer the questions.

Nine pre-schools (*n* 85 children, aged three to four years) agreed to take part in this study. It became apparent upon attending each pre-school to carry out the voice of the child phase, that pre-schools had had difficulty in collecting consent from both parents of each prospective child. **Table 3.3** outlines the numbers of children and consent for the present study.

**Table 3.3 Number of pre-schools and parental consent in ‘voice of the child’ phase**

	Number of pre-schools	Number of children
Services agreeing to participate	9	85
No consent obtained	2	n/a
Consent from one parent	5	n/a
Consent from two parents	2	7
n/a, not applicable		

When the first picture of food was shown to the children in the group situation, and they were asked the first question about this picture, it became apparent that the children were unable to relate their feeling about the food picture they were being shown to the hedonic symbols they had been given.

After a number of unsuccessful attempts, the children were then asked to point to the hedonic symbols and were asked what they thought each symbol portrayed. It became apparent that the children’s perceptions of the symbols were at odds to that which had been outlined in the literature by Chen *et al.*, (1996). **Table 3.4** outlines the children’s responses in this study, and the description given by American children, of similar age, in the study carried out by Chen *et al.*, (1996).

**Table 3.4 Hedonic symbols; literature and children’s explanation in ‘voice of the child’ phase**

Hedonic symbol description in literature <sup>a</sup>	Children’s interpretation in this study
‘super bad’	‘bold’; ‘sad’; ‘mad’; ‘cross’; ‘happy’
‘bad’	‘sad’; bored’; ‘don’t know’; ‘full’
‘maybe good or maybe bad’	‘grumpy’; ‘happy’; ‘tonking’; ‘sad’
‘Good’	‘happy’
‘Super good’	‘Sad’; ‘more happy’; ‘why is there two happy faces?’

<sup>a</sup>[Chen et al, 1996]

### ***3.9.3.1 Data collection outcome***

Due to the inability to collect sufficient data from this study no results ‘per se’ are available to include in this thesis. The implications of the ethical constraints placed on this study have been considered and a paper published to describe them (**Appendix 24**).

## **3.10 Pre-school Education Resource Pack development (phase 5)**

The Healthy Incentive for Pre-schools project was developed to encourage and motivate pre-schools to carry out best practice in relation to nutrition, food service, physical activity and the pre-school environment. The intervention involved the training of pre-schools on how to achieve best practice using the Pre-school Education Resource Pack. This pack was specifically developed in response to the nutrition and health related needs identified in the pre-intervention data collection phase (phase 3).

The Pre-school Education Resource Pack includes two books (**Appendix 25**) created specifically for pre-schools. The ‘Best Practice Guide’ was developed to outline the Pre-school Health Promotion Activity Scored Evaluation Form, and accompanying ‘best practice standards’ in an easy to use colourful format. The ‘Hints and Tips’ book was produced to provide comprehensive best practice information, collected through literature review, to support the ‘Best Practice Guide’ in an user friendly format.

### **3.10.1 ‘Best Practice Guide’**

The ‘Best Practice Guide’ outlines the Pre-school Health Promotion Activity Pre-school Health Promotion Activity Scored Evaluation Form, the ‘best practice criterion

standards’ and the steps needed to use this tool to achieve best practice in each of its criteria. The guide is divided into 4 sections following the format of the Pre-school Health Promotion Activity Scored Evaluation Form (Environment; Food Service; Meals and Snacks). A detailed explanation of childcare practices that would achieve ‘No score’; ‘Minimum Standard score’ or ‘Best Standard score’ is provided. Reference page numbers are included in each ‘Best Practice Guide’ criterion section, which directs readers to the appropriate part of the ‘Hints and Tips pack’ for more detailed and background material on the topic area.

### **3.10.2 ‘Hints and Tips pack’**

The ‘Hints and Tips Pack’ provides relevant in-depth information on best practice points and includes reference to other useful resources such as the ‘Food and Nutrition Guidelines for Pre-schools’ (Department of Health and Children (Ireland), 2004), the ‘3 week menu plan – a resource for pre-schools’ (Irish Health Service Executive, 2004) and ‘Eating well for under 5’s in childcare: practical and nutritional guidelines’ (Crawley, 2006). The pack includes information on meals and snacks; food serving sizes; iron; healthy snacks; drinks and fluids; ‘family style food service’; fussy/picky eating; eating utensils; food and budgeting; health promotion policy development; food and education; physical activity; and outdoor time.

### **3.10.3 Testing of Pre-school Education Resource Pack**

The Pre-school Education Resource Pack and accompanying training pack was literacy proofed with community dietitians, the Local Expert Group membership and tested with local childminders. The pack was developed, tested and printed between January and

July 2010. Once completed and printed; pre-school services were contacted in order to commence the Healthy Incentive for Pre-schools project intervention (phase 6).

### **3.11 Intervention (phase 6)**

#### **3.11.1 Randomisation**

In the original project protocol, it had been planned to randomise the participating pre-schools into two groups. It was envisaged that once pre-intervention data were collected in each pre-school, randomisation would be undertaken and pre-schools would be either assigned to a control group that would receive no feedback on the practice observed during their pre-school visit nor any information regarding how best to improve practice; or randomised to an intervention group in which they would get feedback from their pre-intervention visit and would also get a staff training session on how to improve their practice.

Following pre-intervention data collection, however, discussion with the National Advisory Group led to a recommendation that it would be unethical to fail to provide any information to the control group. Therefore, it was decided that the pre-schools would be randomised into two parallel intervention delivery groups: one group in which only the manager of the pre-school would be provided with training, and the second group in which the manager would be given training and, in addition, staff would also receive a separate training session.

Following completion of all pre-school pre-intervention visits, a random-number table was used to allocate pre-schools into two parallel intervention delivery groups: a group in which only the manager of each pre-school was trained ('manager trained'



group) (*n* 30); and a group in which the manager and staff were trained ('manager and staff trained' group) (*n* 31); one pre-school had closed prior to randomisation occurring.

### **3.11.2 Intervention administration**

To effectively train child care workers, it has been recommended that the trainer should visit the child care centres to determine the realities of working in the field and must converse with providers in a language that is familiar and understandable to them; adult learning styles are advocated, integrating training with previous experience, enabling interactive and experiential learning and fostering time for discussion and contemplation (Shapiro Kendrick, 1994). Preparation for this intervention involved the visiting of pre-schools during the pre-intervention phase and the collection therein of information regarding everyday practice.

Contact by telephone was made with each pre-school manager and an appointment made to provide feedback to them solely ('manager trained group) or to give feedback to them as the manager and, in addition, to facilitate a staff training session ('manager and staff trained' group). Appointments and training sessions were confirmed in writing. The intervention (phase 6) was implemented between July 2010 and February 2011.

As part of the intervention pre-schools received information about their pre-intervention practice, as measured by the Pre-school Health Promotion Activity Scored Evaluation Form, and information on how to achieve best practice using the Pre-school Education Resource Pack (**Appendix 25**). Prior to each visit, a specific individualised detailed written feedback record was generated through review of each pre-schools' file and records.

### ***3.11.2.1 'Manager trained' intervention***

A Research Dietitian met, in a face to face manner, with each pre-school manager on an individual basis for a one hour training session. During this time period the Research Dietitian firstly outlined the project process to date; the next project steps and the resources available. Secondly, the Pre-school Education Resource Pack (**Appendix 25**) was introduced to each manager, and each best practice criterion on the Pre-school Health Promotion Activity Scored Evaluation Form was outlined and discussed. Thirdly, each manager was provided with their individualised 'written feedback record' from their pre-intervention visit. Each observation on this record was discussed with the manager as were the suggested strategies for improvement that were outlined. Sufficient numbers of Pre-school Education Resource Packs were provided to each manager for distribution of one copy to each staff member.

Feedback was undertaken with twenty seven of thirty of the 'manager trained' group; reasons for non-participation included: inability to contact the pre-school manager (*n* 1); service provision not appropriate (*n* 1); closure of service (*n* 1).

### ***3.11.2.2 'Manager and staff' intervention***

The manager contact in this grouping mirrored that provided to managers in the 'manager trained' group. In addition, in each of the pre-schools, a structured staff information session, of one and an half hours duration, was undertaken with all staff members by the Research Dietitian.

Adult learning methodologies of group work and group discussion were employed to structure the staff information sessions. Each session for staff included presentation of a number of topics using an informal table top A1 presentation device.

Each topic presentation was followed with group work exercises for the participants. Each group work session culminated in an overall group discussion facilitated by the Research Dietitian. The presentation topics were: Pre-school Health Promotion Activity Scored Evaluation Form and Pre-school Education Resource Pack use to achieve best practice; determination of adequate meal and snack composition; healthy food and fluids for pre-school children; establishing appropriate serving size provision for pre-school children; the 'family style food service' concept; and healthy policy development. Training and feedback was arranged with 18 of 31 of the 'manager and staff trained' group services. There were a number of factors that led to the reduction in this training group: four services could not be contacted; one declined to participate, citing a change in its circumstances; one provided a service that was not appropriate, having changed from offering full day care to offering only sessional service; and one had closed its service.

#### *Postal feedback*

A number of pre-schools randomised to the 'manager and staff' intervention group had difficulties in facilitating training for staff, thus preventing participation in the training process; postal feedback was instead sent to these pre-schools ( $n = 6$ ). Although post-intervention data were collected from these six pre-schools, following discussion with the National Project Advisory Group, this group was omitted from paired data analysis of the effectiveness of the intervention.

### **3.12 Post intervention data collection (phase 7)**

Six to nine months after the intervention period each pre-school was contacted. Data were collected in 18 of the ‘manager and staff trained’ group, with no ‘loss to follow up’, while 24 of 27 ‘manager trained’ pre-schools participated in the post-intervention phase. A number of services were unable to participate in the post-intervention phase. Reasons for non-participation included: changes in service provision (*n* 1); service closure (*n* 1); manager sick and unable to participate (*n* 1). Three of the six pre-schools sent postal information participated in phase 7; of those who did not participate, the reasons given were: not wishing to participate (*n* 1); tried to implement and did not succeed so did not feel any point in follow-up (*n* 1); could not contact pre-school despite repeated efforts to do so (*n* 1).

#### **3.12.1 Observation based data collection**

The protocol for data collection in the post-intervention phase (phase 7) mirrored that in the pre-intervention data collection phase (phase 3) (**section 3.8**). Each service was contacted and subsequently notified of their visit date. Visits by one Research Dietitian took place across all days of the week, but in each pre-school on one day only, and comprised of collection of reported pre-school characteristics and direct observation of practice. As per the pre-intervention phase all characteristics were recorded on the Pre-school Characteristic Collection Form (**Appendix 11**) and all observations were recorded using the Pre-school Detailed Assessment Tool (**Appendix 12**) and from this the Pre-school Health Promotion Activity Scored Evaluation Form (**Appendix 13**) criterion scores were assigned by comparing observations made to the project’s ‘best

practice criterion standards'. In each pre-school, a score was given for each 'section', and an 'overall' score was calculated. In each case the 'overall' score, was used to classify the pre-school into a: Participation, Bronze, Silver, Gold or Platinum category.

### **3.12.2 Self-reported data collection**

Post-intervention, in addition to the Research Dietitian's observation based data collection, pre-school managers were asked to observe and self-report their own practice using the Pre-school Health Promotion Activity Scored Evaluation Form (**Appendix 13**). Each pre-school was requested to return their self assessed Pre-school Health Promotion Activity Scored Evaluation Form to the Research Dietitian within one week of the observation visit, to enable comparison between the self assessment scores and the direct observation scores already assigned.

### **3.13 Incentive scheme determination (phase 8)**

The determination of the incentive scheme (phase 8) (see **chapter 6**), using the Delphi Technique, commenced with the postal delivery of round 1 letters (**Appendix 26**), explanation sheets (**Appendix 27**) and questionnaires (**Appendix 28**) in December 2011. Round 2 letters (**Appendix 29**) and questionnaires (**Appendix 30**) were sent out in March 2012 with data collection completed by the end of April 2012.

### **3.14 Data analysis**

Use of the Pre-school Health Promotion Activity Scored Evaluation Form allowed the collection and scoring of nutrition and health related practice in each pre-school during the pilot, pre- and post-intervention studies. All data collected were coded and inputted in the Statistics Package for the Social Sciences (SPSS) for Windows, Version 20 (SPSS Inc., Chicago, Illinois, USA) and all statistical analysis was carried out using SPSS. Detailed statistical analysis information will be provided in each relevant individual chapter.

## CHAPTER 4

# USE OF A PRE-SCHOOL HEALTH PROMOTION ACTIVITY SCORED EVALUATION FORM TO COLLECT PRE- INTERVENTION DATA IN A SAMPLE OF PRE-SCHOOLS PROVIDING A FULL DAY CARE SERVICE IN IRELAND

### *PRE-INTERVENTION (PHASE 3) DATA COLLECTION RESULTS*

#### **4.1 Introduction**

While Summerbell (2007) noted that it was impossible to compare the cost effectiveness of obesity treatment and prevention interventions, a recent Irish study determined that in 2009, the estimated direct and indirect cost of overweight and obesity was €1.3 billion, with 35% being direct healthcare costs and 65% related to indirect costs (*safefood*, 2012). Rising rates of overweight and obesity in young children are well documented (Ogden *et al.*, 2002; Sherry *et al.*, 2004; Ogden *et al.*, 2006) and, in Ireland, the National Pre-school Nutrition Survey (Irish Universities Nutrition Alliance, 2012) identified that 23% of pre-school age children were overweight or obese with higher levels of overweight and obesity observed in the younger age groups.

While traditionally, a child's development was dependent mostly on their parents, this paradigm has shifted and, with more parents now working (Central Statistics Office (Ireland), 2009), the childcare setting is acknowledged to have a

potential role in obesity prevention (Story *et al.*, 2006; Kaphingst & Story, 2009) and the promotion of health (Gupta *et al.*, 2005). Ells *et al.*, (2005) suggest that with the difficulty in recognising those children most at risk of developing obesity in the community, focusing interventions on healthy eating and physical activity promotion will assist all children, and not just those at greatest risk. However, the pre-school as a setting for health related research, is a relatively new one and researchers such as Larson *et al.*, (2011) have advocated the need to gather information on current nutrition and physical activity practice in child care to enable the garnering of an understanding of the role these practices may have in relation to health.

The nutrition environment a child experiences plays a ‘critical’ role in their food habit development (Briley & McAllaster, 2011). Rosenthal *et al.*, (2009) suggest that to maximize child development, the quality of the childcare they receive should be high, the onus being on the childcare provider to ensure best practice in relation to nutrition and feeding (American Academy of Pediatrics & American Public Health Association, 2002). While many countries have best nutrition and health practice guidelines for the early years setting (American Academy of Pediatrics & American Public Health Association, 2002; Department of Health and Children (Ireland), 2004; Government of South Australia, 2005; Health Promotion Agency for Northern Ireland, 2005; Scottish Executive, 2006; Welsh Assembly Government, 2009; School Food Trust, 2012), there is a concern that practice regulations set to ensure minimum standards for this setting may be perceived by some as a predictor of quality (Horgan, 2001). Evidence would suggest that the regulation of healthy eating, food service and physical activity in this setting may not be very strong (Benjamin *et al.*, 2009a; Benjamin *et al.*, 2009b; Kaphingst & Story, 2009), with more emphasis being placed on safety evaluation (Department of Health and Children (Ireland), 2006; Ammerman *et al.*, 2007).



Little is known regarding the environmental factors that impact on nutrition and health related practices of pre-schools providing a ‘full day care service’ in Ireland. While reported data have been published (Jennings *et al.*, 2011), data collected by observation, the method considered to be the ‘gold standard’ (Gittelsohn *et al.*, 1994), are lacking. An initial pilot of pre-school practice using the Pre-school Health Promotion Activity Scored Evaluation Form specifically developed and validated for use in the Healthy Incentive for Pre-schools project demonstrated poor nutrition and health related practice in a small sample of pre-schools in County Wicklow (Johnston Molloy *et al.*, 2011) (**Appendix 20**).

The aim of the current study was to use the validated Pre-school Health Promotion Activity Scored Evaluation Form to collect pre-intervention data on environmental influences and nutrition and health related practices in pre-schools offering a full day care service in the Midlands of Ireland, with a view to using the data collected to identify training needs for the development of an Pre-school Education Resource Pack for this setting as part of the overall Healthy Incentive for Pre-schools project process.

## **4.2 Methods**

The development, modification and validation process undertaken for the Pre-school Health Promotion Activity Scored Evaluation Form (**Appendix 11**), the Pre-school Characteristic Collection Form (**Appendix 12**) and the Detailed Assessment Form (**Appendix 13**) that are used in this phase of the study, together with the sample selection process, research schedule and data collection methods, are outlined in **Chapter 3**.

### **4.2.1 Statistical analysis**

All data that were collected were coded and inputted into the Statistics Package for the Social Sciences (SPSS) for Windows, Version 20 (SPSS Inc., Chicago, Illinois, USA). All statistical analysis was then undertaken using SPSS. Descriptive statistics (frequencies) were used to define the characteristics of the pre-schools in the study, their nutrition practices and food and beverage provision. Practice data are presented using percentages and actual (*n*) values. Following assessment of normality of data distribution, Pre-school Health Promotion Activity Scored Evaluation Form overall scores and section scores are presented using medians with interquartile ranges; percentages and actual (*n*) values are used to outline the number of pre-schools achieving each Healthy Incentive for Pre-schools project classification level and ‘Not Minimum Standard’, ‘Minimum Standard’, or ‘Best Practice’ criterion standards. Differences between scores of two independent groups were tested using the Mann Whitney *U* test (for skewed data), and between three or more groups using the Kruskal-Wallis Test (for skewed data). Results were considered significant with a P-value less than 0.05.

## **4.3 Results**

### **4.3.1 Pre-school characteristics**

Seventy six of 100 eligible pre-schools registered to take part in the Healthy Incentive for Pre-schools project. Data collection was not possible in fourteen of these pre-schools due to: change in service provision type, i.e. full day care to sessional care service provision (*n* 9); exclusion by Pre-school Inspection Team (*n* 4); service closure (*n* 1). While pre-intervention data were collected in sixty two pre-schools, data from

four of these visits were excluded from the pre-intervention database for analyses; these were data from services that did not provide written consent (*n* 2); did not provide a main meal as no children remained in the service at main meal time (*n* 1); provided care only for children with intellectual disabilities (*n* 1). **Table 4.1** outlines the characteristics of the fifty eight pre-schools in which pre-intervention data were collected and analysed.

**Table 4.1 Pre-intervention characteristics of all eligible pre-schools (phase 3) (n 58)**

	<i>n</i>	%	Median	IQR
Total number of staff	58	100	8	5-13
Number of full time staff	58	100	4	3-7
Number of part time staff	58	100	3	1-6
Total number of children attending service	57	98.3	38	27-69
Number of children in FDC service	56	96.6	19	12-31
Number of children attending pre-school for <5 hours	55	94.8	19	9-37
Minimum age a child may enter pre-school service (in months)	56	96.6	4	3-6
Actual age of entry in months	47	81	7	6-9
Number of children in FDC service <12 months	50	86.2	2	0-2
Number of children in FDC service 12- 24 months	47	81	4	1-7
Number of children in FDC service 25-36 months	46	79.3	6	3-10
Number of children in FDC service > 36 months	48	82.8	8	4-12
Weekly cost of childcare (€) for children in FDC service < 12 months	48	82.8	150	140-169
Weekly cost of childcare (€) for children in FDC service 12-24M	57	98.3	150	140-165
Weekly cost of childcare (€) for children in FDC service 25-36M-	58	100	150	140-165
Weekly cost of childcare (€) for children in FDC service >36M-	58	100	150	140-165
Cost of food provision (€) per week	51	87.9	200	90-250
Cost of food provision (€) per week private	35	89.7	175	90-240
Cost of food provision (€) per week community	16	82.4	255	118-357
<i>Total sample:</i>				
Cost of food provision (€) <14 children in FDC service FDC	18	90	114	80-164
Cost of food provision (€) 15-25 children in FDC service	16	84.2	163	74-251
Cost of food provision (€) >26 children in FDC service	15	88.2	250	240-400
<i>Private only:</i>				
Cost of food provision (€) <14 children in FDC service	13	86.7	120	85-188
Cost of food provision (€) 15-25 children in FDC service	12	92.3	145	70-200
Cost of food provision (€) >26 children in FDC service	8	88.9	250	210-250
<i>Community only:</i>				
Cost of food provision (€) <14 children in FDC service	5	100	107	50-155
Cost of food provision (€) 15-25 children in FDC service	4	66.7	280	129-319
Cost of food provision (€) >26 children in FDC service	7	87.5	367	250-450

*n*, number of pre-schools; %, percentage, IQR, Interquartile Range; €, euro; FDC, full day care

#### ***4.3.1.1 Manager reported practice***

Pre-intervention, thirty nine (67%) of the 58 pre-schools were privately owned and nineteen (33%) were not for profit community run services, which employed community employment staff as part of the workforce. While 58 services provided a ‘full day care service’, 57 of the 58 services also provided a ‘sessional care service’. Managers reported that all services prepared food on the premises, that 55 (95%) prepared the main meal onsite and that in 54 (93%) services, parents provided at least some of the food for children during the pre-school day. **Table 4.2** presents the practices reported by managers and collected using the Pre-school Characteristic Collection Form.

**Table 4.2 Pre-intervention pre-school managers' reported practices (phase 3)**

<b>Manager reported practices:</b>	<b><i>n</i> (%)</b>
<b>Food related practice</b>	
Provision of breakfast	41 (71)
Packet gravy used in cooking or service of food	40 (69)
Addition of packet soup to cooking	34 (59)
Addition of stock cubes to cooking	34 (59)
Dedicated chef for all meals	33 (57)
Provide processed food once per week	32 (55)
Addition of packet / jars sauces to cooking	28 (48)
Sugar coated cereal provided for breakfast	7 (13)
Addition of sugar during cooking	3 (5)
<b>Funding</b>	
Previously tried to apply for 'school meals scheme' funding	9 (15)
Received funding from 'school meals scheme'	2 (3)
Previously tried to apply for 'school milk scheme'	1 (2)
Received funding from 'schools milk scheme'	1 (2)
<b>Training and resources</b>	
Possess copy of Food and Nutrition Guidelines for Pre-school services	39 (67)
Possess copy of '3 week menu resource pack' in pre-school	34 (59)
Staff ever attended healthy eating training	30 (53)
Keep '3 week menu resource pack' in kitchen	18 (31)
<b>Policy development</b>	
Written healthy policy	43 (74)
Staff awareness of policy	41 (71)
Parent involvement	6 (10)
Written policy on breastfeeding	2 (3)
<b>Weaning related practice</b>	
Bottles given > 12 months	45 (80)
Children < 12 months other fluids in bottles	36 (62)
Juice in bottle	13 (22)
Allow bottles in bed	7 (13)
<b>Menus and practice</b>	
Written menu cycle	54 (93)
Actual menu visible	49 (86)
Parent input into menus	49 (85)
Parents informed daily of foods eaten	48 (83)
Separate menu < 12 months	32 (55)
Separate menu < 12 months due to parents	25 (43)
4 week cycle	15 (26)
1 week cycle	13 (22)
3 week cycle	12 (21)
2 week cycle	7 (12)
No cycle	6 (10)
5 week cycle	1 (2)

*n*, number of pre-schools; %, percentage; /, or; >, greater than<; less than.

#### **4.3.1.2 Manager reported food provision costs**

When pre-schools were divided into three groups according to the total number of children attending the service (Group 1: small: 31 children or less; Group 2: medium: 32-55 children; Group 3: large: 56 children and above), a significant difference in cost of food provision was noted between the pre-school sizes ( $P = 0.002$ ), with the Group 3 pre-schools having the highest median food provision cost ( $Md = €250$ ), followed by Group 2 with median food cost of €200, and Group 1 with a median food cost of €100. No significant difference was noted between the food provision costs of private and community services. However, a significant size dependent difference ( $P = 0.016$ ) was observed between the food provision costs of private pre-schools, with medium sized pre-schools reporting that they spend the most on food.

#### **4.3.2 Health related practice observed**

**Table 4.3** depicts key health related practices observed during the pre-intervention data collection visits. In all areas of practice observation, poor adherence to best practice guidelines was noted. For example, in relation to physical activity and outdoor time a low frequency of physical activity episodes was observed in the various age groups, with the oldest children's age groups receiving the highest frequency of physical activity episodes. Few pre-schools were observed to take all children outdoors during their time spent in the full day care service, with little evidence observed of the presence of outdoor clothing and footwear, to enable children to go outdoors on cooler days or days that might be drizzly or wet. Considering food related practices, many services were observed to use food rewards such as: 'treat day Fridays' on menus; staff using verbal prompts of food as rewards at mealtimes; or provision of 'junk' type food on celebration days. At mealtimes, nearly fifty percent of services allowed children to

leave the table before the meal was complete; the minority of services were providing lidless cups to infants less than twelve months and children aged 12-24 months, or providing plates for children's food at mealtimes, regardless of age group.



**Table 4.3 Key health related practices of pre-schools pre-intervention (phase 3)**

Health related practices observed	Pre-intervention <i>n</i> (%)
<b>Policy</b>	
Visible written healthy policy	3 (5)
Parental or staff involvement in policy development	1 (2)
Includes reference to whole pre-school environment	0
<b>Food related education materials</b>	
Visible evidence of food related education materials in each pre-school room	32 (55)
<b>Physical activity related practice</b>	
Children aged 25-36 months participate in physical activity	39 (68)
Children aged > 36 months participate in physical activity	38 (66)
Children aged 12-24 months participate in physical activity	28 (49)
Participation in child driven seamless physical activity	7 (12)
Infants participate in physical activity	4 (7)
Activity timetable clearly visible in hallway	4 (7)
<b>Outdoor time practice</b>	
Children aged > 36 months are taken outside at least once /day	35 (60)
Children aged 25-36 months are taken outside at least once /day	34 (59)
Outdoor clothing visible	31 (53)
Children aged 12-24 months are taken outside at least once /day	24 (41)
All children taken outside by pre-school staff	20 (35)
Infants are taken outside at least once /day	5 (9)
Wellington boots visible	4 (7)
<b>Healthy reward practice</b>	
Treat processed food on menu on Friday	32 (55)
Food 'Treat Day'	26 (45)
Evidence of healthy reward scheme that uses non-food items as reward	7 (12)
<b>'Family style food service'</b>	
Clearing of dishes at end of meal in all rooms	42 (73)
All children allowed to leave table before end of food time	26 (45)
Cleaning of table surfaces in all rooms at all meals	14 (24)
Children watching television while eating	7 (13)
Appropriate seats for staff in all rooms	6 (10)
Sweeping the floor at table before end of meal	6 (10)
Meals and snacks perceived to be relaxed events	5 (9)
Children participate in preparation, service and clean up of meal in all rooms at all mealtimes	5 (9)
Food and nutrition discussed at mealtimes in all rooms	2 (3)
Stories told in all rooms	2 (3)
Older children waiting until all served	1 (2)
<b>Appropriate utensil provision</b>	
Unlidded beaker for children aged > 36 months	48 (83)
Cups unlidded for children aged 25-36 months	24 (42)
Bottles with sports' top lids for children aged > 36 months	18 (31)
Plates for all snacks for children aged > 36 months	15 (26)
Plates for snacks for children aged 25-36 months	14 (24)
Plates for all snacks for children aged 12-24 months	10 (17)
Bottles with sports' top lids for children aged 25-36 months	11 (19)
Bottles with sports' top lids for children aged 12-24 months	8 (14)
Cup unlidded for children aged 12-24months	4 (7)
Correct cutlery for children aged < 12 months	2 (3)
Correct cutlery for children aged 12-24 months	2 (3)
Correct cutlery for children aged 25-36 months	2 (3)
Correct cutlery for children aged > 36 months	1 (2)
Cup unlidded for children aged < 12 months	1 (2)
Plates for all food for children aged < 12 months	1 (2)

*n*, number of pre-schools; %, percentage; -, to; <, less than; >, greater than.

### 4.3.3 Food groups and snack types observed

**Table 4.4** outlines the numbers of pre-schools providing an appropriate serving of food for the main meal of the day. In all age groups, very low numbers of pre-schools were observed to provide adequate servings of protein, starch, dairy or vegetables at the main meal, with slightly more pre-schools observed to provide adequate servings of starch and vegetables compared with dairy or protein foods.

**Table 4.4 Provision of appropriate serving of main meal constituents pre-intervention (phase 3)**

Health-related practices observed	Pre-intervention data <i>n</i> (%)
<b>Protein: appropriate serving provision</b>	
25-36 months	9 (16)
> 36 months	8 (14)
12-24 months	6 (10)
< 12 months	2 (3)
<b>Starch: appropriate serving provision</b>	
12-24 months	20 (35)
25-36 months	19 (33)
> 36 months	18 (31)
< 12 months	8 (14)
<b>Dairy: appropriate serving provision</b>	
> 36 months	5 (9)
25-36 months	3 (5)
12-24 months	1 (2)
< 12 months	1 (2)
<b>Vegetables: appropriate serving provision</b>	
> 36 months	11 (19)
25-36 months	11 (19)
12-24 months	9 (16)
< 12 months	4 (7)

*n*, number of pre-schools; %, percentage; -, to; <, less than; >, greater than.

**Table 4.5** depicts the variety of snacks provided to children during the pre-school day, including that supplied by the pre-school and by parents. Children were provided with fruit; fromage frais; sandwiches with cheese or meat; or biscuits, in over half the preschools observed; while yoghurts, cereal bars and cheese strings were offered in over a third of services. Crisps, chocolate, pre-packed lunch type products, cake and chocolate spread were observed in approximately one tenth to one fifth of services.

**Table 4.5 Snack types observed pre-intervention (phase 3)**

<b>Snack type</b>	<b><i>n</i> (%)</b>
Fruit	50 (86)
Fromage frais	45 (78)
Sandwiches with cheese / meat	33 (57)
Biscuits	31 (53)
Yoghurt	26 (45)
Cereal bars	22 (38)
Cheese strings	21 (36)
Probiotics	17 (29)
Crackers	17 (29)
Raisins	16 (28)
Cheese	14 (24)
Chocolate spread sandwiches	11 (19)
Cake	9 (16)
Chocolate	8 (14)
Crisps	7 (12)
Pre-packed lunch product	6 (10)
Jelly	5 (9)
Popcorn	4 (7)
Sweets	4 (7)
Bread and jam	3 (5)
Custard	3 (5)
Other dried fruit	2 (3)

*n*, number of pre-schools; %, percentage

#### **4.3.4 Perceived barriers to healthy food provision**

Through the Pre-school Characteristic Collection Form, pre-school managers were asked a qualitative open ended question on the barriers that they believed prevented healthy food provision in the pre-school setting. **Table 4.6** outlines the barriers reported by the managers, and provides quotations associated with these. Analysing the data, five main themes emerged, with managers perceiving that: children's food habits; cost and time; parents; information deficit; and staff attitudes to practice and parents, were all barriers to healthy food provision in this setting.

**Table 4.6 Pre-school managers' perceptions of barriers to healthy food provision in childcare pre-intervention (phase 3)**

<b>Themes</b>	<b>Quotes</b>
<b>Children's established food habits</b>	<i>'children don't like vegetables'</i> <i>'providing variation in carbohydrate at main meal proved difficult so now all main meals are potato-based'</i> <i>'difficulties getting children to eat'</i> <i>'food fads among children e.g. red sauce'</i>
<b>Cost and time issues</b>	<i>'time concerns when making food from scratch'</i> <i>'time involved in preparing 'proper' food'</i> <i>'healthy food provision is time consuming, need a dedicated person to deal with this'</i> <i>'financial problems: not able to buy food in bulk'</i> <i>'cost if food not eaten'</i>
<b>Parents as a barrier</b>	<i>'parental food provision under 18 months; consistency not appropriate for age'</i> <i>'parents not following through what is being done in crèche'</i> <i>'healthy eating not enforced at home which breaks child's routine established during the week'</i> <i>'healthy food provision difficult due to parental food provided in lunchboxes'</i> <i>'parents using bribery'</i> <i>'dealing with parents'</i>
<b>A need for more information</b>	<i>'need healthy afternoon snack ideas'</i> <i>'lack of education on making healthy meals interesting'</i> <i>'ideas on shopping and reading labels'</i> <i>'How to encourage children to eat all foods on the plate'</i>
<b>Staff attitudes to practice and to parents</b>	<i>'when introducing different types of foods and tasks people have different ideas'</i> <i>'staff and parents with differing opinions'</i> <i>'staff and parents not understanding why things are implemented and the need for best practice'</i> <i>'can't give chicken curry to children under 2 years'</i>

#### **4.3.5 Healthy Incentive for Pre-schools project classifications achieved**

Classification category levels on the Pre-school Health Promotion Activity Scored Evaluation Form are: Participation level (0-19); Bronze level (20-39); Silver level (40-54); Gold level (55-64); and Platinum level (65-72). Forty four (76%) services achieved a Participation level classification while 14 (24%) achieved a Bronze level classification. Of those attaining Participation level, thirty one (78%) were private providers of pre-school care and of those achieving Bronze level, 8 (21%) were private

services. Thirteen (68%) community pre-schools achieved a Participation level and 6 (32%) achieved a Bronze level.

#### **4.3.6 Pre-intervention section and overall scores achieved**

The Pre-school Health Promotion Activity Scored Evaluation Form ‘overall’ score and ‘section’ scores achieved pre-intervention are outlined in **Table 4.7**. The median ‘overall’ score achieved on the Pre-school Health Promotion Activity Scored Evaluation Form was fourteen out of a potential score of 72, with the interquartile range being 12-19. The median ‘section’ scores assigned were highest for the ‘snacks’ section of the Pre-school Health Promotion Activity Scored Evaluation Form and lowest for the ‘food service’ section. In comparing the pre-intervention scores achieved by private and community services, no significant difference was noted in the ‘environment’, ‘food service’, ‘meals’ or ‘snacks’ Pre-school Health Promotion Activity Scored Evaluation Form ‘section’ scores or ‘overall’ Pre-school Health Promotion Activity Scored Evaluation Form score. Further, comparison of scores revealed that there was no significant difference in the environment, food service, meals or snacks ‘section’ scores, or ‘overall’ score, achieved by pre-schools with different numbers of children attending the full day care service: small (less than 14 children); medium (15-25 children) or large (more than 26 children), or different numbers of children attending the overall service: small (less than 31 children); medium (32-55 children) or large (greater than 56 children).

**Table 4.7 Pre-school Health Promotion Activity Scored Evaluation Form ‘overall’ and ‘section’ scores: pre-intervention (phase 3)**

<b>Pre-school Health Promotion Activity Scored Evaluation Form</b>	<b><i>n</i></b>	<b>%</b>	<b>Median</b>	<b>IQR</b>
‘Overall’ score (maximum 72)	58	100	14	12-19
Environment ‘section’ score (maximum 18)	58	100	3	2-4
Food service ‘section’ score (maximum 18)	58	100	2	1-3
Meals ‘section’ score (maximum 18)	58	100	4	2-5
Snacks ‘section’ score (maximum 18)	58	100	6	4-9

*n*, number of pre-schools; %, percentage of pre-schools, IQR, Interquartile Range.

#### **4.3.7 Pre-intervention criteria scores achieved**

**Table 4.8, Table 4.9, Table 4.10** and **Table 4.11** outline the median ‘section’ score achieved by pre-schools in the ‘environment’, ‘food service’, ‘meals’ and ‘snack’ sections of the Pre-school Health Promotion Activity Scored Evaluation Form respectively. Each table then further depicts the number of pre-schools achieving either ‘not minimum standard’, ‘minimum standard’ or ‘best practice’ in each of the criteria outlined in the respective Pre-school Health Promotion Activity Scored Evaluation Form section.

**Table 4.8 Pre-school Health Promotion Activity Scored Evaluation Form  
'environment' section scoring: pre-intervention (phase 3)**

Pre-schools pre-intervention ( <i>n</i> 58)			
Pre-school Health Promotion Activity Scored Evaluation Form section	Median	IQR	
<b>Environment (maximum 18)</b>	3	2-4	
Pre-school Health Promotion Activity Scored Evaluation Form criterion	Not minimum standard <i>n</i> (%)	Minimum standard <i>n</i> (%)	Best Practice <i>n</i> (%)
Visibility of whole pre-school health policy	55 (95)	3 (5)	-
Education materials	19 (33)	36 (62)	3 (5)
Planned physical activity	12 (21)	46 (79)	-
Outdoor play time	19 (33)	37 (64)	2 (3)
Food used as reward	22 (38)	30 (52)	6 (10)
Adequate number of meals & snacks	55 (95)	2 (3)	1 (2)

*n*, number of pre-schools; %, percentage, IQR, Interquartile Range; &, and.

In the 'environment' section, the median pre-school score was three, of a possible maximum score of eighteen. Over ninety percent of pre-schools were rated as 'not minimum standard' for 'visibility of whole pre-school health policy' and for provision of 'adequate number of meals & snacks', while over half of pre-schools were rated as 'minimum standard' in relation to provision of education materials, healthy rewards and participation in planned physical activity and outdoor time. No pre-schools were undertaking 'best practice' in relation to planned physical activity.

**Table 4.9 Pre-school Health Promotion Activity Scored Evaluation Form ‘food service’ section scoring: pre-intervention (phase 3)**

Pre-schools pre-intervention ( <i>n</i> 58)			
Pre-school Health Promotion Activity Scored Evaluation Form section	Median	IQR	
Food service (maximum 18)	2	1-3	
Pre-school Health Promotion Activity Scored Evaluation Form criterion	Not minimum standard <i>n</i> (%)	Minimum standard <i>n</i> (%)	Best Practice <i>n</i> (%)
Staff sitting at food times	54 (93)	3 (5)	1 (2)
Staff eating with children	51 (88)	7 (12)	-
‘Family style food service’	51 (88)	7 (12)	-
Adequate time at meals & snacks	22 (38)	29 (50)	7 (12)
All children actively encouraged to feed selves	9 (16)	45 (78)	4 (7)
Appropriate feeding & drinking utensils	55 (95)	2 (3)	1 (2)

*n*, number of pre-schools; %, percentage, IQR, Interquartile Range.

The median score achieved by pre-schools in the ‘food service’ section was the lowest attained in all Pre-school Health Promotion Activity Scored Evaluation Form sections; this is reflected in the criterion scoring, with the majority of pre-schools (over 85%) being rated as ‘not minimum standard’ in four of the six section criteria. While three quarters of pre-schools were rated as ‘minimum standard’ in their active encouragement of children to self feed, only half of pre-schools attained a ‘minimum standard’ in the amount of time they allocated to meals and snack times. No pre-schools achieved a ‘best practice’ score for enabling a ‘family style food service’ or for staff practice of eating with children at food times.



**Table 4.10 Pre-school Health Promotion Activity Scored Evaluation Form ‘meals’ section scoring: pre-intervention (phase 3)**

Pre-schools pre-intervention ( <i>n</i> 58)			
Pre-school Health Promotion Activity Scored Evaluation Form section	Median	IQR	
Meals (maximum 18)	4	2-5	
Pre-school Health Promotion Activity Scored Evaluation Form criterion	Not minimum standard <i>n</i> (%)	Minimum standard <i>n</i> (%)	Best Practice <i>n</i> (%)
Appropriate portion of protein	27 (47)	28 (48)	3 (5)
Appropriate portion of starch	1 (2)	42 (72)	15 (26)
Appropriate portion of dairy	41 (71)	14 (24)	3 (5)
Appropriate portion of vegetables	21 (36)	26 (45)	11 (19)
Self service meals	49 (85)	9 (16)	-
Iron rich foods provided at main meal	29 (50)	26 (45)	3 (5)

*n*, number of pre-schools; %, percentage, IQR, Interquartile Range.

The ‘meals’ section median score for pre-schools was four out of a possible maximum score of eighteen. Over half of pre-schools were rated as ‘not minimum standard’ in three of the six criteria in this section, particularly in the provision of appropriate servings of dairy and iron rich foods and the facilitation of self service. While nearly three quarters of pre-schools attained a ‘minimum standard’ for the portion of starch provided, less than an half were rated as ‘minimum standard’ for the appropriate provision of protein. No pre-schools were observed to provide meals in a truly ‘self service’ manner.

**Table 4.11 Pre-school Health Promotion Activity Scored Evaluation Form ‘snack’ section scoring: pre-intervention (phase 3)**

Pre-schools pre-intervention ( <i>n</i> 58)			
Pre-school Health Promotion Activity Scored Evaluation Form section	Median	IQR	
Snack (maximum 18)	6	4-9	
Pre-school Health Promotion Activity Scored Evaluation Form criterion	Not minimum standard <i>n</i> (%)	Minimum standard <i>n</i> (%)	Best Practice <i>n</i> (%)
Appropriate portion of fruit as snack	3 (5)	41 (71)	14 (24)
Provision of foods from the top shelf of the Food Pyramid	-	44 (76)	14 (24)
Dairy other than at main meal	5 (9)	35 (60)	18 (31)
Drinks with snacks	42 (72)	11 (19)	5 (9)
Drinks with meals	24 (41)	10 (17)	24 (41)
Milk & water between meals	51 (88)	7 (12)	-

*n*, number of pre-schools; %, percentage, IQR, Interquartile Range.

The median score of six achieved by pre-schools in the ‘snack’ section of the Pre-school Health Promotion Activity Scored Evaluation Form was the highest median score achieved in all four sections. The highest level of ‘best practice’ scoring was observed within this section with over 30% of pre-schools attaining this level for the drinks provided with meals and dairy provision other than at the main meal. However, although over 70% of pre-schools achieved a ‘minimum standard’ score for the level of fruit and Food Pyramid ‘top shelf’ foods provided, over 70% also achieved a ‘not minimum standard’ for the drinks they provided at designated snack times and the drinks which were provided to children at other times between meals.

## 4.4 Discussion

Many studies, in a number of countries, have demonstrated poor nutrition and physical activity practices in the child care setting (Benjamin *et al.*, 2007a; Ball *et al.*, 2008; Gubbels *et al.*, 2010; Lloyd-Williams *et al.*, 2011; Parker *et al.*, 2011) and previous preliminary (Johnston *et al.*, 2007; Johnston Molloy *et al.*, 2007; Molloy *et al.*, 2007) and pilot (Johnston Molloy *et al.*, 2011) studies in Ireland have also pointed toward poor nutrition and health related practice. The pre-intervention data collected in this study add to the evidence supporting the need for intervention in this setting to promote best health-related practice. Use of the Pre-school Characteristic Collection Form facilitated the collection of data on pre-schools including: their characteristics, reported practices and health related perceptions, while use of the validated Pre-school Health Promotion Activity Scored Evaluation Form, in tandem with the Detailed Assessment Tool, has enabled the collection of observational data on health and nutrition related practice in pre-schools providing a ‘full day care’ service. While a number of studies in other countries have used tools specifically developed to collect observational data on varying aspects of pre-school life (Alkon *et al.*, 2008; Ward *et al.*, 2008b; Schwartz *et al.*, 2009; Falbe *et al.*, 2011; Lanigan, 2012), to the best of our knowledge, this is the first time that a validated tool has been developed and used to collect observational data in this setting in Ireland.

Administration of the Pre-school Detailed Assessment tool enabled the collection of detailed background data on health related practice, food serving sizes and snacks provided in this setting. Poor food and fluid provision and staff food and physical activity related practices were noted. Provision of inadequate quantities of food and food of poor nutritional quality is a cause for concern (Briley & McAllaster,

2011) as children of pre-school age require a diet with a high nutrient density (Dwyer *et al.*, 2010). Growth and development potential may be affected if insufficient food is provided to young children while they are in a pre-school providing full day care (Food Safety Authority of Ireland, 1999b; Department of Health and Children (Ireland), 2004). An added cause for concern is the finding that there is poor staff practice in relation to mealtimes, physical activity and outdoor time, particularly when one considers that poor health related habits developed during childhood continue into adulthood (Batsell *et al.*, 2002).

Both self-assessment tools (Benjamin *et al.*, 2007a; Henderson *et al.*, 2011) and observation based tools (Ball *et al.*, 2007; Lanigan, 2012) have been used previously to ascertain various aspects of food provision and health related practices. Both types of tools have demonstrated inadequacies in the quality of the practices assessed. In this study, similar inappropriate routines and inadequate systems were observed in all areas explored using the Pre-school Health Promotion Activity Scored Evaluation Form: the environment of the pre-school; the way in which food was served and children's mealtime experience; the types and quantities of food and fluids served with meals, snacks and at other times. Considering that a maximum score of eighteen was achievable in each section of the Pre-school Health Promotion Activity Scored Evaluation Form, it is of concern that the lowest median 'section' score was two (in the Food Service section) and the highest median 'section' score was six, (in the Snacks section). Therefore, it is not surprising, that of a possible total score of seventy-two, the median 'overall' score achieved by the pre-schools in this study was 14, with observed practices captured using the Pre-school Detailed Assessment tool being reflected in the scores achieved.

Lanigan (2012) stated that pre-school providers' healthy eating and practice beliefs should be explored in any initiative to improve health related practice in this setting, to enable the design of training that '*addresses provider misconceptions and promotes their sense of efficacy*'. It is interesting to note, therefore, that childcare staff in this study cited a number of issues that they perceived to be barriers to provision of healthy food in the childcare setting including: children's established food habits, the cost of providing healthy food and time; parents; lack of information on best practice; and staff attitudes to changes in practice and to parents. Other studies, questioning this participant group type, have also demonstrated similar findings (Taveras *et al.*, 2006; Jennings *et al.*, 2011).

The identification of specific unsatisfactory procedures in this study helped to facilitate the development of a tailored Pre-school Education Resource Pack for the Healthy Incentive for Pre-schools project. As the criteria on the Pre-school Health Promotion Activity Scored Evaluation Form were based on best practice, and because this tool had been validated (Johnston Molloy *et al.*, 2011), the data collected were invaluable to this process. The ability to customize the Pre-school Education Resource Pack was important, as authors such as Clark *et al.*, (2008) advocate that, while there is a need to provide pre-school staff with information on best practice, there is also a need to provide staff with tools to implement change and an ability to explain the reasons for any changes made. Indeed, staff trained in nutrition related practice, have been found to be significantly more likely to engage in supportive feeding practices, the person providing the training and the relevance of their qualifications being a more powerful determinant than the frequency of training (Sigman-Grant *et al.*, 2011).

A number of limitations may be attributed to this study which may affect the generalizability of the results obtained. The pre-schools that participated were based in

one geographical region in the Midlands of Ireland, an area which is considered to be disadvantaged (Small Area Health Research Unit, 2006); therefore, it may be necessary to replicate the study process in a less disadvantaged area to determine whether the results obtained may have been affected by the study location. It is worth noting, though, that the results of the pilot study, that took place in Co. Wicklow, demonstrated similar poor practice in relation to food provision and practice (Johnston Molloy *et al.*, 2011).

Another potential limitation is that pre-schools that enrolled in the project may have been more motivated than their counterparts who did not participate, or may have felt they needed more assistance with this aspect of their service; to clarify this, further study to determine practice in those pre-schools that did not engage is warranted; however, there is a need to determine a method to engage and motivate these disengaged services to partake in such a study.

While this study was based on the gathering of observational data and this is considered the most effective data collection method (Gittelsohn *et al.*, 1994), rather than a team of researchers undertaking observation, data were collected in this study by one researcher. Although this may be considered a limitation, as it was not possible to determine inter-rater reliability, having even one extra ‘outside’ person in a pre-school setting may affect the inherent practices undertaken; therefore, use of one researcher results in minimal interruption compared to the effect of a team of researchers working in a single setting on a particular day. This is particularly important given that this study aimed to collect data, with minimal disruption to the staff or the children, an important consideration when planning any research activity in this setting.

It could also be said that a further possible limitation may have been that an appointment was made to visit each pre-school; therefore, essentially ‘preparing’ pre-

schools to alter practice for the visit of the researcher. However, to counteract this possibility, pre-schools were not advised of the specific components that would be observed on the visit day. The poor practices noted would appear to reflect actual practice as, by the very nature of the pre-school and the children cared for therein, it would be difficult to alter practice with children within a two week period, as habits and routines undertaken with this age group take much repetition and time to change (Cooke, 2007; O'Connell *et al.*, 2012).

With calls for research to determine nutrition and physical practice (Larson *et al.*, 2011) and an acknowledgement that few interventions have been undertaken in this setting to promote healthful practice (Flynn *et al.*, 2006; Story *et al.*, 2008), the American Dietetic Association advocates areas of quality practice in the pre-school setting: meal planning; food preparation and service; physical and emotional environment; and consultation and training (American Dietetic Association, 2005; American Dietetic Association, 2011). The results of this study concur that these are areas that pre-schools in Ireland should pursue in order to ensure that children in this setting receive an optimal level of nutrition for requisite growth and development.

## **4.5 Conclusion**

This is the first study to use a validated Pre-school Health Promotion Activity Scored Evaluation Form in association with a Pre-school Detailed Assessment tool and a Pre-school Characteristic Collection Form to collect data on food provision and health related practice in pre-schools providing a 'full day care service' in Ireland. The evidence gathered corroborates previous research that suggests there is poor nutrition and physical activity practice in this setting and adds to the research that advocates a

need for interventions in pre-schools to improve food provision, the food service environment and nutrition and physical activity practice. The information collected in this study formed the basis for the tailored content of the Pre-school Education Resource Pack developed in phase 5 of the Healthy Incentive for Pre-schools project which would be used in the study intervention (phase 6).



## **CHAPTER 5**

### **AN EVALUATION OF THE EFFECTIVENESS OF AN INTERVENTION (USING TWO METHODS OF TRAINING DELIVERY) ON THE IMPROVEMENT OF NUTRITION AND HEALTH RELATED PRACTICE IN IRISH PRE-SCHOOLS PROVIDING A FULL DAY CARE SERVICE**

#### ***COMPARISON OF PRE- (PHASE 3) AND POST-INTERVENTION (PHASE 7) DATA COLLECTION RESULTS***

##### **5.1 Introduction**

The provision of a physical and social environment that supports the pre-school child's physical growth and their emotional, intellectual and motor skill development is extremely important (Dwyer, 1993). It has been noted that the child care setting has the potential to be a successful vehicle for obesity prevention (Story *et al.*, 2006; Kaphingst & Story, 2009) and for health promotion (Gupta *et al.*, 2005) and researchers have called for studies that will provide an understanding of nutrition and physical activity practices in pre-schools (Larson *et al.*, 2011). Kaphingst & Story (2009) suggest that although much intervention research has been undertaken in the school setting the child

care setting has been mostly overlooked, while Flynn *et al.*, (2006), in reviewing best practice in reducing obesity and related chronic disease in children and young people, noted that there are few such interventions in pre-schools and funding should be directed to develop prevention programmes in this setting.

Many parents are now relying ‘on child care providers to share parents’ traditional role of ‘gatekeeper’ on their children’s nutrient intake’ (American Dietetic Association, 2005). The education of children, in full day care, in the development of healthy eating patterns, is becoming predominantly that of the childcare provider, the professionals charged with the care of children (Lanigan, 2012). The promotion of physical activity through the development of motor skills is also very important during the pre-school years; however, little research is available for this population (Hodges *et al.*, 2013). Paediatricians and health care professionals have a role in highlighting to parents and caregivers the importance of nurturing these skills through unstructured and structured play (Riethmuller *et al.*, 2009).

Although guidelines are available in a number of jurisdictions regarding the promotion of best nutrition, physical activity and health practice for the early years setting (American Academy of Pediatrics & American Public Health Association, 2002; Department of Health and Children (Ireland), 2004; Government of South Australia, 2005; Health Promotion Agency for Northern Ireland, 2005; Scottish Executive, 2006; Welsh Assembly Government, 2009; School Food Trust, 2012) associated regulations have been noted to be poor (Benjamin *et al.*, 2009a; Benjamin *et al.*, 2009b; Kaphingst & Story, 2009), with the environment of the childcare facility instead mainly evaluated for safety (Department of Health and Children (Ireland), 2006; Ammerman *et al.*, 2007).

In Ireland, the pre-school is a relatively new setting with the number of children attending for full-day care increasing rapidly in recent years (Central Statistics Office

(Ireland), 2009); currently, there is no uniform formal training for pre-school staff on nutrition and healthy food or physical activity, nor does the legislation to enforce such training exist. Irish ‘Food and Nutrition Guidelines for pre-school Services’(Department of Health and Children (Ireland), 2004) and physical activity guidelines (Department of Health (Ireland) & Health Service Executive, 2011) are available but are not mandatory, which would suggest that methods to encourage the provision of nutritious food and physical activity in this setting must be pursued. In the Midlands of Ireland, a multi-stakeholder ‘Local Expert Group’ developed an intervention scheme (Healthy Incentive for Pre-schools project) aiming to incentivise pre-schools to improve their nutrition, physical activity and health related practices.

This study tests the hypothesis that, in comparison to pre-schools receiving an intervention comprised of ‘manager only’ training, those pre-schools randomised to receive a staff education session, in addition to manager training, would show greater improvements in their nutrition and physical activity practice, and food service provision, from pre-to post-intervention, when measured using a specifically developed and validated Pre-school Health Promotion Activity Scored Evaluation Form.

## **5.2 Methods**

In this phase of the Healthy Incentive for Pre-schools project, pre-schools were revisited six to nine months after the intervention (**section 3.11**) was implemented and post-intervention data were collected by the same Research Dietitian using the Pre-school Health Promotion Activity Scored Evaluation Form (**Appendix 13**), Pre-school Characteristic Collection Form (**Appendix 11**) and the Pre-school Detailed Assessment Form (**Appendix 12**) outlined in **Chapter 3**. In addition, pre-school providers were

requested to self report their practice using the Pre-school Health Promotion Activity Scored Evaluation Form (**Appendix 13**). The randomisation of pre-schools to two training groups; the intervention administered to the two training groups; and the data collection methods undertaken in this phase are outlined in **Chapter 3**.

### **5.2.1 Analysis of the data**

All data collected were coded and inputted in the Statistics Package for the Social Sciences (SPSS) for Windows, Version 20 (SPSS Inc., Chicago, Illinois, USA) and all statistical analysis was carried out using SPSS. The Analyses of outcomes of the intervention included pre-schools that completed all phases of the project: pre-intervention, intervention and post-intervention ( $n = 42$ ). Normality of distribution was assessed using the Kolmogorov-Smirnov statistic and distribution of normal probability plots. Descriptive statistics (frequencies) were used to define the characteristics of the study pre-schools, their nutrition practices and food and beverage provision. Non-parametric statistical data analysis was undertaken, as the data were measured on nominal and ordinal scales, were not transformed and the sample size was relatively small. The Wilcoxon Signed Rank Test was used to test differences in Pre-school Health Promotion Activity Scored Evaluation Form scores, from pre- to post-intervention, within each intervention group; while the Mann Whitney  $U$  test was used to test differences between the two intervention training groups pre-intervention and post-intervention. Results were considered significant at  $P < 0.05$ .

## 5.3 Results

### 5.3.1 Pre-school characteristics

Pre-intervention data were collected in 62 pre-schools with data from 4 services excluded from analysis (see **Chapter 4**). Data were analysed for fifty eight pre-schools pre-intervention. Forty two pre-schools completed all phases of the project: the pre-intervention, intervention and post-intervention phases. **Table 5.1** outlines the pre-intervention characteristics of all pre-schools; those that proceeded to the post-intervention phase and those that did not do so; no statistically significant difference was noted between the characteristics of these two sets of pre-schools.

The pre-schools visited pre-intervention were randomly assigned to the two intervention groups: a 'manager trained' group; and a 'manager and staff trained' group. Forty two pre-schools completed both the pre-intervention and post-intervention phase of the project. **Table 5.2** outlines the pre-intervention characteristics of the pre-schools involved in both the pre- and post-intervention phases of the study ( $n = 42$ ). Pre-intervention, no statistically significant difference was noted between the characteristics of the 'manager trained' group and the 'manager and staff trained' group.

**Table 5.1 Pre-intervention characteristics of pre-schools that progressed to the post-intervention phase and those that did not progress**

	Proceeded to post-intervention (n 42)				Did not proceed to post-intervention (n 16)				P value
	n	%	Median	IQR	n	%	Median	(IQR)	
Total number of staff	42	100	8	5-14	16	100	7	4-13	0.346
Number of full time staff	42	100	4	3-7	16	100	4	2-7	0.560
Number of part time staff	42	100	3	1-7	16	100	2	1-4	0.185
Total number of children attending service	42	100	39	28-70	15	94	33	20-62	0.301
Number of full day care children	41	97.6	17	13-34	15	94	20	12-30	0.753
Number of children attending pre-school for <5 hours	41	97.6	20	9-38	14	88	17	8-32	0.511
Minimum age a child may enter pre-school service (in months)	40	95.2	4	3-6	16	100	5	3-11	0.478
Actual age of entry in months	34	81.0	6	5-9	13	81	7	5-10	0.773
Number of FDC <12 months	37	88.1	1	0-2	13	81	2	0-3	0.880
Number of FDC 12- 24 months	34	81.0	4	2-7	13	81	4	1-9	0.905
Number of FDC 25-36 months	33	78.6	6	4-10	13	81	4	2-11	0.914
Number of FDC > 36 months	35	83.3	7	4-12	13	81	8	4-13	0.492
Weekly cost of childcare for FDC children < 12 months	36	85.7	150	136-164	12	75	165	146-178	0.083
Weekly cost of childcare for FDC children 13-24 months	42	100	150	139-160	15	94	160	145-170	0.153
Weekly cost of childcare for FDC children 25M-36 months	42	100	150	139-156	16	100	158	145-169	0.153
Weekly cost of childcare for FDC children >36 months	42	100	150	139-156	16	100	158	145-169	0.144
Cost of food provision (€) per week	37	88.1	200	88-250	14	88	180	99-253	0.832

*n*, number of pre-schools; %, percentage, IQR, Interquartile Range; FDC, full day care; <, less than; >, greater than; €, euro

**Table 5.2 Pre-intervention characteristics of pre-school participants (phase 3)**

All study pre-intervention pre-schools that proceeded to the post-intervention phase									
Characteristics	Manager trained group (n 24)				Manager and staff trained group (n 18)				P value
			n (%)				n (%)		
Private			15 (62.5%)				11 (61.1%)		1.000
Community			9 (37.5%)				7 (38.9%)		1.000
	n	%	Median	(IQR)	n	%	Median	(IQR)	P value
Total number of carers	24	100	8	6-15	18	100	9	5-12	0.750
Number of full-time carers	24	100	5	3-10	18	100	4	3-4	0.070
Number of part-time carers	24	100	3	1-5	18	100	3	2-8	0.300
Total number of children	24	100	41	29-80	18	100	37	27-70	0.751
Number of children > 5 hours / day (FDC)	23	95.8	17	13-31	18	100	20	11-38	0.655
Number of children < 5 hours / day	23	95.8	19	9-38	18	100	21	8-39	0.733
Number of children in FDC (< 12 months)	20	83.3	2	0-3	17	94.4	1	0-2	0.313
Number of children in FDC (13-24 months)	19	79.2	4	3-6	15	83.3	2	1-8	0.272
Number of children in FDC (25-36 months)	18	75	6	5-10	15	83.3	6	3-10	0.478
Number of children in FDC (> 36 months)	19	79.2	8	5-14	16	88.9	5	2-10	0.122
Cost of FDC service (€) /week < 12 months	24	100	148	131-163	14	77.8	150	139-168	0.553
Cost of FDC service (€) / week 13-24 months	24	100	150	140-163	18	100	150	134-160	0.878
Cost of FDC service (€) / week 25-36 months	24	100	150	140-155	18	100	150	134-160	0.868
Cost of FDC service (€) / week 36 months+	24	100	150	140-155	18	100	150	134-160	0.908
Cost food provision (€) / week	22	91.7	188	80-250	15	83.3	200	120-300	0.577

*n*, number of pre-schools; %, percentage, IQR, Interquartile Range; /, per; - to; €, Euro; FDC, full day care; *P*, significance level ( $P < 0.05$ ).

### 5.3.2 Pre-intervention scores achieved by pre-schools

A comparison of pre-intervention Pre-school Health Promotion Activity Scored Evaluation Form ‘overall’ scores and ‘section’ scores, of pre-schools that proceeded to the post-intervention phase and those that did not, showed no significant difference between the two pre-school sets. **Table 5.3** outlines the ‘overall’ and ‘section’ scores achieved by the two pre-intervention samples.

**Table 5.3 Pre-intervention scores of the pre-schools that proceeded to the post-intervention phase and those that did not proceed**

SEF Scores	Pre-schools which proceeded to the post-intervention phase (n 42)		Pre-schools which participated in the pre-intervention phase only (n 16)		
	<i>Median</i>	<i>IQR</i>	<i>Median</i>	<i>IQR</i>	<i>P value</i>
<b>Overall Score (maximum 72)</b>	14	12-20	16	10-19	0.780
<b>Section Scores (maximum 18)</b>					
Environment	3	2-4	3	2-4	0.872
Food service	2	1-3	2	1-4	0.691
Meals	4	2-5	4	2-7	0.634
Snacks	6	4-9	4	3-6	0.089

SEF, Pre-school Health Promotion Activity Scored Evaluation Form

n, number of pre-schools; IQR, Interquartile Range;

P, significance level \* $P \leq 0.05$ , \*\* $P \leq 0.01$ , \*\*\* $P \leq 0.001$

### 5.3.3 Pre-intervention health promotion practices

No significant difference was noted in any pre-intervention Pre-school Health Promotion Activity Scored Evaluation Form ‘overall’, ‘section’ or criteria scores between forty two pre-schools randomly assigned to a ‘manager trained’ group and ‘manager and staff trained’ group.



### **5.3.4 Post-intervention health promotion practices**

**Table 5.4** outlines the median Pre-school Health Promotion Activity Scored Evaluation Form ‘overall’ scores and ‘section’ scores and their respective interquartile ranges, pre- and post-intervention, in both training groups. Post-intervention, an evaluation using the Pre-school Health Promotion Activity Scored Evaluation Form demonstrated no significant difference in overall health promotion practices between a ‘manager trained’ and a ‘manager and staff trained’ group.

Significant difference was only noted between the two groups in three of the twenty four Pre-school Health Promotion Activity Scored Evaluation Form criteria. These were the ‘Appropriate serving of starch’ criterion ( $P= 0.041$ ); the ‘Self service style food provision’ criterion ( $P =0.045$ ); and the ‘Dairy portion provision outside main meal’ criterion ( $P = 0.042$ ), with the ‘manager and staff trained’ group attaining significantly higher scores.

**Table 5.4 Pre-school Health Promotion Activity Scored Evaluation Form section scores and overall scores pre- and post-intervention in the two training groups**

SEF Section Scores <sup>a</sup> (maximum 18)	Manager only training group (n 24)				P value <sup>b</sup>	Manager and staff training group (n 18)				P value <sup>b</sup>	P value <sup>c</sup>
	Pre-intervention		Post-intervention			Pre-intervention		Post-intervention			
	Median	IQR	Median	IQR		Median	IQR	Median	IQR		
Environment	3	2-4	8	4-10	<0.001***	3	3-4	8	5-10	<0.001***	0.626
Food service	2	1-3	6	4-11	<0.001***	2	1-4	6	4-7	0.004**	0.608
Meals	4	2-5	8	4-10	0.001**	4	3-5	9	6-13	0.001**	0.207
Snacks	5	4-9	12	8-16	<0.001***	7	5-9	11	10-12	0.001**	0.565
Overall Score (maximum 72)	13	11-21	34	21-45	<0.001***	15	14-19	34	27-41	<0.001***	0.849

*n*, number of pre-schools; IQR, Interquartile range

<sup>a</sup> Scores range from 0-18 in each section; 0-72 as overall score

<sup>b</sup> Wilcoxon Signed Rank test, \* *P*< 0.05; \*\* *P*<0.01; \*\*\**P*<0.001

<sup>c</sup> Mann Whitney U test, \* *P*< 0.05; \*\* *P*<0.01; \*\*\**P*<0.001

SEF, Pre-school Health Promotion Activity Scored Evaluation Form

### **5.3.5 Improved health promotion practices across two time points**

Improvements in health promotion practices occurred across two time points in a 'manager trained' group and in a 'manager and staff trained' group. Median 'overall' score increased from 13 to 34 in the 'manager trained' group and 15 to 34 in the 'manager and staff trained' group. Both training groups increased equally their median score in the 'Environment section' (+ 5) and 'Food service section' (+ 4). The 'manager and staff trained' group had higher median score change in the 'Meal section' (+ 5 vs. + 4), while the 'manager trained' group median score increase was higher in both the 'Snack' (+7 vs. +4) section.

From the pre-intervention to the post-intervention phase, the 'manager trained' group and the 'manager and staff' trained group significantly improved their practice in the majority of criteria scores assessed. Each Pre-school Health Promotion Activity Scored Evaluation Form criterion score will now be outlined in detail.

#### ***5.3.5.1 Pre- to post intervention environment 'criteria' scores***

Table 5.5 outlines the Pre-school Health Promotion Activity Scored Evaluation Form environment criteria scores pre- and post-intervention. Pre-intervention, over 85% of pre-schools in both training groups achieved a 'not minimum standard' score for policy provision. Post-intervention, 50% of each group significantly improved their practice gaining either a 'minimum standard' or 'best practice' score.

Approximately half of each group provided evidence of food related materials pre-intervention thereby achieving a 'minimum standard' score. After the intervention over 40% earned a 'best practice' score, reflecting significant improvement within both groups.

Pre-intervention, 25% of the 'manager trained' group and 11% of the 'manager and staff trained' group achieved a 'not minimum standard' score for physical activity provision. After the intervention, over 90% in both groups attained a 'minimum standard' score. While the 'manager trained' group significantly improved practice across the two time points, no significant improvement was observed in the 'manager and staff trained' group.

Approximately one third of each group failed to provide outdoor time and outdoor clothing during the pre-intervention phase, resulting in a 'not minimum standard' score. Post-intervention, approximately one third of both groups significantly improved, attaining a 'best practice' standard.

The 'manager trained' group significantly improved their food reward practice, with approximately one third attaining a 'best practice' score post-intervention. However, no such significant improvement was observed within the 'manager and staff trained' group.

Over 75% of the 'manager trained' group did not improve meal and snack provision; maintaining a 'not minimum standard' score across the two time points. Post-intervention, however, the 'manager and staff trained' group significantly improved, with 11% attaining a 'minimum standard' and 28% earning a 'best practice' score.

**Table 5.5 Frequency of ‘environment’ section criteria scores pre- and post-intervention in the two training groups**

Environment SEF criteria	Manager only training group (n 24)							Manager and staff training group (n 18)						
	Pre-intervention n (%)			Post-intervention n (%)			P-value <sup>b</sup>	Pre-intervention n (%)			Post-intervention n (%)			P-value <sup>b</sup>
	NMS	MS	BP	NMS	MS	BP		NMS	MS	BP	NMS	MS	BP	
Policy	23 (96)	1 (4)	0	10 (42)	11 (46)	3 (13)	0.001**	16 (89)	2 (11)	0	6 (33)	11 (61)	1 (6)	0.002**
Education materials	11 (46)	12 (50)	1 (4)	1 (4)	12 (50)	11 (46)	0.001**	4 (22)	14 (78)	0	0	9 (50)	9 (50)	0.001**
Planned Physical activity	6 (25)	18 (75)	0	1 (4)	22 (92)	1 (4)	0.035*	2 (11)	16 (89)	0	0	18 (100)	0	0.157
Outdoor time	8 (33)	14 (58)	2 (8)	2 (8)	13 (54)	9 (38)	0.004**	6 (33)	12 (67)	0	1 (6)	12 (67)	5 (28)	0.004**
Food as reward	8 (33)	14 (58)	2 (8)	2 (8)	15 (63)	7 (29)	0.007**	7 (39)	9 (50)	2 (11)	1 (6)	15 (83)	2 (11)	0.313
Adequate number meals & snacks	22 (92)	1 (4)	1 (4)	18 (75)	4 (17)	2 (8)	0.059	18 (100)	0	0	11 (61)	2 (11)	5 (28)	0.014*

*n*, number of pre-schools; % percentage; SEF, Pre-school Health Promotion Activity Scored Evaluation Form

NMS, Not Minimum Standard (Score=0); MS, Minimum Standard (Score = 1); BP, Best Practice (Score = 3)

<sup>b</sup> Wilcoxon Signed Rank test, \*  $P < 0.05$ ; \*\*  $P < 0.01$ ; \*\*\*  $P < 0.001$

### *5.3.5.2 Pre- and post-intervention food service criteria scores*

Table 5.6 outlines the Pre-school Health Promotion Activity Scored Evaluation Form food service criteria scores pre- and post-intervention. For the practice of staff sitting with children at mealtimes, prior to the intervention more than four-fifths of each training group achieved a ‘not minimum standard’ level. Both groups significantly improved this practice post-intervention with three quarters earning a ‘minimum standard’ score.

Pre-intervention, over 75% of each group achieved a ‘not minimum standard’ for their practice of eating with children. Post-intervention, both groups significantly improved practice. A larger proportion of pre-schools (21%) in the ‘manager trained’ group attained a ‘best practice’ score than in the ‘manager and staff trained’ group; none of whom achieved this standard.

Over three quarters of pre-schools in both groups achieved a ‘not minimum standard’ score for ‘family style food service’. Both groups significantly improved this practice post-intervention with a large proportion (94%) of the ‘manager and staff trained’ group moving to a ‘minimum standard’ and the majority of the ‘manager trained’ group attaining a ‘best practice’ score.

Pre-intervention, half of each group earned a ‘minimum standard’ score for adequate meal and snack time provision. Post-intervention over one third of both groups had improved their practice sufficiently to attain a ‘best practice’ standard.

More than 75% of both groups achieved a ‘minimum standard’ for encouraging children to self-feed pre-intervention, however only the ‘manager trained’ group significantly improved practice post-intervention, with nearly half of these gaining a ‘best practice’ standard.

Neither group significantly improved their utensil provision practice across two time points. Pre-intervention, over 90% of each group earned a 'not minimum standard'. Post-intervention no pre-school achieved a 'best practice' score; with just one third of the 'manager trained' group, and only one pre-school in the 'manager and staff' group achieving a 'minimum standard'.

**Table 5.6 Frequency of ‘food service’ section criteria scores pre- and post-intervention in the two training groups**

	Manager only training group (n 24)						Manager and staff training group (n 18)							
	Pre-intervention n (%)			Post-intervention n (%)			P-value <sup>b</sup>	Pre-intervention n (%)			Post-intervention n (%)			P-value <sup>b</sup>
<b>Food service SEF criteria</b>	NMS	MS	BP	NMS	MS	BP		NMS	MS	BP	NMS	MS	BP	
Staff sitting at food times	23 (96)	1 (4)	0	4 (17)	18 (75)	2 (8)	0.000***	15 (83)	2 (11)	1 (6)	1 (6)	17 (94)	0	0.005**
Staff eating with children	21 (88)	3 (13)	0	10 (42)	9 (38)	5 (21)	0.003**	14 (78)	4 (22)	0	7 (39)	11 (61)	0	0.020*
‘Family style food service’	21 (88)	3 (13)	0	7 (29)	15 (63)	2 (8)	0.000***	14 (78)	4 (22)	0	1 (6)	17 (94)	0	0.000*
Adequate time at meals & snacks	10 (42)	12 (50)	2 (8)	3 (13)	11 (46)	10 (42)	0.002**	7 (39)	9 (50)	2 (11)	0	12 (67)	6 (33)	0.021*
All children actively encouraged to feed selves	3 (13)	21 (88)	0	1 (4)	12 (50)	11 (46)	0.001**	2 (11)	14 (78)	2 (11)	0	11 (61)	7 (39)	0.075
Appropriate feeding & drinking utensils	22 (92)	2 (8)	0	17 (71)	7 (29)	0	0.059	18 (100)	0	0	17 (94)	1 (6)	0	0.317

*n*, number of pre-schools; % percentage; SEF, Pre-school Health Promotion Activity Scored Evaluation Form  
NMS, Not Minimum Standard (Score=0); MS, Minimum Standard (Score = 1); BP, Best Practice (Score = 3)

<sup>b</sup> Wilcoxon Signed Rank test, \* *P*< 0.05; \*\* *P*<0.01; \*\*\**P*<0.001



### ***5.3.5.3 Pre- and post-intervention meal criteria scores***

Table 5.7 outlines the Pre-school Health Promotion Activity Scored Evaluation Form meal criteria scores pre- and post-intervention. Pre-intervention, approximately 50% in both training groups had attained either a ‘not minimum standard’ or ‘minimum standard’ score. Post-intervention both groups significantly improved practice with approximately one third achieving a ‘best practice’ score.

While the ‘manager trained’ group did not significantly improve their serving of starchy food across two time points, significant improvement was observed in the ‘manager and staff trained’ group with the majority moving to achieve a ‘best practice’ score post-intervention.

Two thirds of pre-schools achieved a ‘not minimum standard’ score for their provision of dairy food with the main meal pre-intervention. While the ‘manager trained’ group significantly improved practice, with a third gaining a ‘best practice’ score post-intervention, no such significant improvement was observed in the ‘manager and staff’ trained pre-schools. In both groups, over 50% of pre-schools were still categorised as ‘not minimum standard’ post-intervention.

The provision of an appropriate serving of vegetables with the main meal improved significantly in both training groups, with half of pre-schools achieving a ‘minimum standard’ score pre-intervention and over half achieving a ‘best practice’ score post-intervention.

Over three quarters of pre-schools pre-intervention did not facilitate children to participate in self service pre-intervention. Both group significantly improved practice pre- to post-intervention, with just over half of the ‘manager trained group’ achieving a ‘minimum standard’, and over one quarter achieving a ‘best practice’ standard in the ‘manager and staff trained’ group.

While the standard of iron rich food provision did not improve significantly in either group pre- to post-intervention; approximately one quarter of each group provided sufficient iron rich food to attain a 'best practice' score post-intervention.

**Table 5.7 Frequency of ‘meal’ section criteria scores pre- to post-intervention in the two training groups**

	Manager only training group (n 24)							Manager and staff training group (n 18)							
	Pre-intervention n (%)			Post-intervention n (%)			P-value <sup>b</sup>	Pre-intervention n (%)			Post-intervention n (%)			P-value <sup>b</sup>	
<b>Meal criteria</b>	<b>SEF</b>	<b>NMS</b>	<b>MS</b>	<b>BP</b>	<b>NMS</b>	<b>MS</b>	<b>BP</b>		<b>NMS</b>	<b>MS</b>	<b>BP</b>	<b>NMS</b>	<b>MS</b>	<b>BP</b>	
Portion protein		11 (46)	11 (46)	2 (8)	5 (21)	12 (50)	7 (29)	0.030*	10 (56)	8 (44)	0	3 (17)	8 (44)	7 (39)	0.003**
Portion starch		0	18 (75)	6 (25)	0	17 (71)	7 (29)	0.739	0	15 (83)	3 (17)	0	7 (39)	11 (61)	0.021*
Portion dairy		16 (67)	7 (29)	1 (4)	13 (54)	4 (17)	7 (29)	0.017*	13 (72)	4 (22)	1 (6)	11 (61)	3 (17)	4 (22)	0.222
Portion vegetables		7 (29)	12 (50)	5 (21)	2 (8)	10 (42)	12 (50)	0.024*	7 (39)	9 (50)	2 (11)	1 (6)	4 (22)	13 (72)	0.002**
Self service meals		21 (88)	3 (13)	0	11 (46)	13 (54)	0	0.008**	14 (78)	4 (22)	0	5 (28)	8 (44)	5 (28)	0.005**
Iron rich foods		12 (50)	10 (42)	2 (8)	9 (38)	9 (38)	6 (25)	0.064	8 (44)	9 (50)	1 (6)	6 (33)	7 (39)	5 (28)	0.088

*n*, number of pre-schools; % percentage; SEF, Pre-school Health Promotion Activity Scored Evaluation Form

NMS, Not Minimum Standard (Score=0); MS, Minimum Standard (Score = 1); BP, Best Practice (Score = 3)

<sup>b</sup> Wilcoxon Signed Rank test, \*  $P < 0.05$ ; \*\*  $P < 0.01$ ; \*\*\* $P < 0.001$

#### ***5.3.5.4 Pre- to post intervention snack criteria scores***

Table 5.8 outlines the Pre-school Health Promotion Activity Scored Evaluation Form snack criteria scores pre- and post-intervention. Both training groups significantly improved adequate fruit provision across two time points. Pre-intervention, over half in each group attained a ‘minimum standard’ score. Post-intervention the largest proportion of pre-schools, over three quarters in each group achieved a ‘best practice’ score.

Neither training group significantly reduced their provision of Food Pyramid ‘top shelf’ foods pre- to post-intervention, with the majority of pre-schools in each group maintaining a ‘minimum standard’ score.

Both training groups significantly improved dairy provision ‘*other than main meal*’, pre- to post-intervention. Approximately half of each group attained a ‘minimum standard’ score pre-intervention, while over 75% achieved a ‘best practice’ score post intervention.

Pre-intervention, the vast majority (over 70%) in each group earned a ‘not minimum standard’ score for the fluid types they provided with children’s snacks. Post-intervention, within each group, over 40% had attained a ‘minimum standard’ score, while approximately 20% achieved a ‘best practice’ score.

The ‘manager trained’ groups significantly improved the type of drinks provided with the main meal; the majority attaining a ‘not minimum standard’ score pre-intervention and a ‘best practice score’ post-intervention. The ‘manager and staff trained’ preschools did not significantly improve this practice.

Both training groups significantly improved their provision of fluids between meal and snack times across two time points. Pre-intervention over 85% in both groups earned a ‘not minimum standard’ score pre-intervention. Post-intervention, more than

45% attained a 'minimum standard', and approximately 20% achieved a 'best practice' score in each group.

**Table 5.8 Frequency of ‘snack’ section criteria scores pre- to post-intervention in the two training groups**

Snack criteria	Manager only training group (n 24)							Manager and staff training group (n 18)						
	Pre-intervention n (%)			Post-intervention n (%)			P-value <sup>b</sup>	Pre-intervention n (%)			Post-intervention n (%)			P-value <sup>b</sup>
SEF	NMS	MS	BP	NMS	MS	BP		NMS	MS	BP	NMS	MS	BP	
Fruit as snack	3 (13)	14 (58)	7 (29)	0	3 (13)	21 (88)	0.000***	0	13 (72)	5 (28)	1 (6)	3 (17)	14 (78)	0.008**
Top shelf foods	0	16 (67)	8 (33)	0	13 (54)	11 (46)	0.317	0	14 (78)	4 (22)	0	14 (78)	4 (22)	1.000
Dairy other than main meal	7 (17)	12 (50)	8 (33)	2 (8)	3 (13)	19 (79)	0.002**	1 (6)	8 (44)	9 (50)	0	0	18 (100)	0.004**
Drinks with snacks	20 (83)	2 (8)	2 (8)	9 (38)	10 (42)	5 (21)	0.034*	13 (72)	4 (22)	1 (6)	4 (22)	11 (61)	3 (17)	0.008**
Drinks with meals	10 (42)	5 (21)	9 (38)	2 (8)	4 (17)	18 (75)	0.005**	5 (28)	2 (11)	11 (61)	3 (17)	7 (39)	8 (44)	0.589
Milk & water between meals	21 (88)	3 (13)	0	8 (33)	11 (46)	5 (21)	0.000***	16 (89)	2 (11)	0	5 (28)	10 (56)	3 (17)	0.002**

*n*, number of pre-schools; % percentage; SEF, Pre-school Health Promotion Activity Scored Evaluation Form

NMS, Not Minimum Standard (Score=0); MS, Minimum Standard (Score = 1); BP, Best Practice (Score = 3)

<sup>b</sup> Wilcoxon Signed Rank test, \*  $P < 0.05$ ; \*\*  $P < 0.01$ ; \*\*\*  $P < 0.001$

### 5.3.6 Classification of pre-schools

Improvement in the classifications achieved by the two training groups was observed from the pre- to the post-intervention phase. Pre-intervention the majority (> 70%) of pre-schools in both groups were classified in a ‘participation’ category. Post-intervention over half of each group were classed in the ‘bronze’ category, and over a third classed in the ‘silver’ category or above. **Table 5.9** outlines the number of pre-schools achieving each classification level pre and post intervention.

**Table 5.9 Classification of training group pre-schools pre- and post-intervention**

SEF classifications	Manager trained group (n 24)			Manager and staff trained group (n 18)		
	Pre-intervention n (%)	Post-intervention n (%)	Change n (%)	Pre-intervention n (%)	Post-intervention n (%)	Change n (%)
Participation	17 (71)	3 (13)	-14 (58)	14 (78)	1 (6)	- 13 (72)
Bronze	7 (29)	13 (54)	+ 6 (25)	4 (22)	11 (61)	+ 5 (39)
Silver	0	7 (29)	+ 7 (29)	0	6 (33)	+ 6 (33)
Gold	0	1 (4)	+ 1 (4)	0		
Platinum	0	0	0	0		

*n*, number of pre-schools; % percentage; SEF, Pre-school Health Promotion Activity Scored Evaluation Form

Classification levels: Participation 0-19; Bronze 20-39; Silver 40-54; Gold 55-64; Platinum 65-72

### 5.3.7 Observation and self –assessment scoring methods

**Table 5.10** depicts the scores allocated by two Pre-school Health Promotion Activity Scored Evaluation Form assessment methodologies. A significant difference was noted between the ‘section’ and ‘overall’ scores and the majority of criteria scores assigned by the two assessment methods. Higher Pre-school Health Promotion Activity Scored Evaluation Form scores were achieved when subjective (self) assessment was compared with objective (Research Dietitian) assessment.

**Table 5.10 Intervention group scores <sup>a</sup> (observation and self assessment) post-intervention**

SEF Section Scores (maximum 18)	Manager trained group				Manager & staff trained group						
	Observation ( <i>n</i> 24) Median (IQR)		Self assessment ( <i>n</i> 16) Median (IQR)		<i>P</i> value <sup>b</sup>		Observation ( <i>n</i> 18) Median (IQR)		Self assessment ( <i>n</i> 11) Median (IQR)		<i>P</i> value <sup>b</sup>
<b>Environment</b>	8	4-10	16	14-16	<0.001***		8	5-10	16	10-18	0.003**
<b>Food service</b>	7	4-11	15	12-18	0.001***		6	4-7	16	11-18	0.003**
<b>Meals</b>	8	4-10	16	15-18	<0.001***		9	6-13	16	14-18	0.010*
<b>Snacks</b>	12	8-16	16	16-18	0.001***		11	10-12	16	13-18	0.026*
<b>Overall Score (maximum 72)</b>	34	21-45	64	57-67	<0.001***		34	27-41	64	56-66	0.003**

*n*, number of pre-schools; *P*, significance level

<sup>a</sup>Scores range from 0-18 in each section; 0-72 as overall score

<sup>b</sup> Wilcoxon Signed Rank test, \* *P*< 0.05; \*\* *P*<0.01; \*\*\**P*<0.001

SEF, Pre-school Health Promotion Activity Scored Evaluation Form



### **5.3.8 Health related practices**

The Pre-school Health Promotion Activity Scored Evaluation Form allows the assignation of scores to practice. **Table 5.11** and **Table 5.12** depict the key practices observed pre-and post-intervention, and the change that occurred in each of these practices in the two training groups. Greater than fifty percent improvement in practice was observed in both groups in: the visibility of written healthy policy; provision of outdoor time for children and children's participation in meals and snacks in all rooms. The changes in these various practice areas will now be outlined.

Although the visibility of health promotion policy improved by over 50% in both groups, only approximately one fifth improved their use of the 'whole pre-school approach' to policy development, with only three pre-schools in the 'manager trained' group, and two in the 'manager and staff trained' group including parents or staff in policy development post-intervention.

A greater increase in physical activity timetable provision was observed in the 'manager trained' group (+50%) than in the 'manager and staff trained' group (+27%). Seamless physical activity increased by about 10% in each training group, however, physical activity increased by less than 20% in the under 12 month age category and by approximately one third in the older age groups. Post-intervention, both training groups increased their overall outdoor time provision by over 50%. While approximately one third increased this for all age groups over 12 months; less than 10% increased it for infants. Outdoor clothing provision increased in both groups by approximately a third, with nearly 40% in the 'manager trained' group and just 11% in the 'manager and staff trained' group providing wellies.

A variation in use of food as a reward was evident. A decrease in the use of processed food on Fridays and an increased evidence of healthy reward schemes was

observed in the 'manager trained group' only, while the use of 'food treat' days increased by just under 20% in both groups.

Pre-to post-intervention, a disparity was observed in the extent to which pre-schools engaged in the various aspects of 'family style food service'. The number of pre-schools, in both groups, that facilitated children's participation in preparation, service and clean up increased by at least 50%, with smaller increases observed in other positive practices such as discussion of food at mealtimes. A reduction was evident, varying from 11%- 34%, in the use of inappropriate practices such as the cleaning of tables and sweeping of floors during mealtimes.

Overall the provision of appropriate utensils and cutlery improved post-intervention, however variation was evident between age groups, with the smallest increase in practice change observed in the under 12 month category in both groups. While slight improvement in unlidded cup provision occurred in the < 24month age group, the largest increase of approximately 40% was observed in those aged 25-36 months. Overall the biggest improvement detected was in the provision of appropriate cutlery to children over 12 months of age with improvements ranging from 34% – 67% in the various age groups.

**Table 5.11 Key ‘Environment’ practices of pre-schools pre- and post-intervention**

Health Practices	Manager trained group (n 24)			Manager and staff trained group (n 18)		
	Pre- n (%)	Post- n (%)	Change (%)	Pre- n (%)	Post- n (%)	Change (%)
<b>Environment</b>						
<i>Policy</i>						
Visible written healthy policy	1 (4)	15 (63)	+ 59	2 (11)	12 (67)	+56
Includes reference to whole pre-school environment	0	4 (17)	+ 17	2 (11)	6 (33)	+22
Parental or staff involvement in policy development	0	3 (13)	+ 13	1 (6)	2 (11)	+ 5
<i>Physical activity related practice</i>						
Activity timetable clearly visible in hallway	1 (4)	13 (54)	+ 50	1 (6)	6 (33)	+27
Infants physical activity participation	1 (4)	5 (21)	+ 17	3 (17)	4 (22)	+5
12-24M physical activity participation	10 (42)	20 (83)	+ 41	10 (56)	15 (83)	+ 27
25-36M physical activity participation	12 (50)	20 (83)	+ 33	14 (78)	16 (89)	+11
> 36M physical activity participation	15 (63)	23 (96)	+ 33	11 (61)	18 (100)	+ 39
Participation in child driven seamless physical activity	2 (8)	4 (17)	+ 9	2 (11)	4 (22)	+11
<i>Outdoor time practice</i>						
Children outside	8 (33)	21 (88)	+ 55	6 (33)	17 (94)	+61
Infants outside	3 (13)	5 (21)	+ 8	2 (11)	3 (17)	+ 6
12-24M outside	8 (33)	19 (79)	+ 46	9 (50)	14 (78)	+28
25-36M outside	11 (46)	20 (83)	+ 37	12 (67)	16 (89)	+22
> 36M	14 (58)	21 (88)	+ 30	11 (61)	17 (94)	+33
Outdoor clothing visible	15 (63)	24 (100)	+ 37	10 (56)	18 (100)	+44
Wellies visible	1 (4)	10 (42)	+ 38	2 (11)	4 (22)	+11
<i>Healthy reward practice</i>						
Food ‘Treat Day’	9 (38)	10 (42)	+ 4	8 (44)	5 (28)	+16
Treat processed food on menu on Friday	10 (42)	7 (29)	- 13	10 (56)	3 (17)	+39
Evidence of healthy reward scheme that use non-food items as reward	5 (21)	8 (33)	+ 12	5 (28)	2 (11)	-17

*n*, number of pre-schools; %, percentage, M, month; FDC, full day care; >, greater than; < less than; +, increase; - decrease

**Table 5.12 Key ‘Food Service’ practices of pre-schools pre- and post-intervention**

Health Practices	Manager trained group (n 24)			Manager and staff trained group (n 18)		
	Pre- n (%)	Post- n (%)	Change (%)	Pre- n (%)	Post- n (%)	Change (%)
<b>Food Service</b>						
Appropriate seats for staff in all rooms	3 (13)	6 (25)	+ 12	2 (11)	8 (44)	+33
<b>‘Family Style Food Service’</b>						
Food and nutrition discussed at mealtimes in all rooms	1 (4)	12 (50)	+ 46	1 (6)	7 (39)	+33
Stories told in all rooms	1 (4)	4 (17)	+ 13	0	0	-
Children watching television while eating	1 (4)	0	- 4	0	0	0
Older children waiting until all served	0	5 (21)	+21	0	1 (6)	+6
All children allowed to leave table before end of food time	10 (42)	2 (8)	- 34	9 (50)	4 (22)	-28
Clearing of dishes before end of meal in all rooms	19 (79)	10 (42)	- 37	9 (50)	10 (56)	+6
Cleaning of table surfaces in all rooms at all meals	5 (21)	1 (4)	- 17	6 (33)	1 (6)	-27
Sweeping the floor at table before end of meal	10 (42)	2 (8)	- 34	3 (17)	1 (6)	-11
Children participate in preparation, service and clean up of meals in all rooms at all mealtimes	3 (13)	15 (63)	+ 50	2 (11)	14 (78)	+67
<b>Provision of appropriate utensils</b>						
Cup unlidged < 12 M	0	1 (4)	+ 4	1 (6)	0	-
Correct cutlery < 12M	0	4 (17)	+ 17	1 (6)	3 (17)	+11
Plates for all food < 12M	0	3 (13)	+ 13	1 (6)	3 (17)	+11
Cup unlidged 12-24M	2 (8)	5 (21)	+ 13	1 (6)	4 (22)	+16
Bottles with sports’ top lids 12-24M	3 (13)	10 (42)	+ 29	4 (22)	2 (11)	-11
Plates for all snacks 12-24M	4 (17)	12 (50)	+ 33	4 (22)	8 (44)	+22
Correct cutlery 12-24M	1 (4)	17 (71)	+ 67	0	8 (44)	+44
Cups unlidged 25-36M	8 (33)	18 (75)	+ 42	6 (33)	13 (72)	+39
Bottles with sports’ caps 25-36M	5 (21)	10 (42)	+ 21	5 (28)	5 (28)	-
Plates for snacks 25-36M	4 (17)	15 (63)	+ 46	8 (44)	12 (67)	+23
Correct cutlery 25-36M	2 (8)	10 (42)	+ 34	0	10 (56)	+56
Unlidged beaker > 36M	19 (79)	21 (88)	+ 9	15 (83)	18 (100)	+17
Bottles with sports’ caps > 36M	8 (33)	16 (67)	+ 34	6 (33)	10 (56)	+23
Plates for all snacks > 36M	4 (17)	13 (54)	+ 37	9 (50)	10 (56)	+6
Correct cutlery > 36M	1 (4)	10 (42)	+ 38	0	10 (56)	+56

n, number of pre-schools; %, percentage, M, month; FDC, full day care; >, greater than; < less than; +, increase; - decrease

### **5.3.9 Managers' perceptions**

Through the Pre-school Characteristic Collection Form, qualitative open ended questions were asked during the post-intervention data collection visit (phase 7), to determine the pre-school managers' perception of: positive changes to practice post intervention; aspects of the project perceived to be difficult to change; and the barriers preventing changes in practice. **Table 5.13**, **Table 5.14** and **Table 5.15** respectively outline the grouped themes and selected examples of quotations from the pre-school managers on these issues.

**Table 5.13 Pre-school managers' reported positive practice changes**

<b>Themes</b>	<b>Quotes</b>
<b>Changes to shopping habits</b>	<i>'Think when shopping what to put into it instead of processed'</i> <i>'Moved from frozen to fresh food in evenings'</i> <i>'Making staff more aware of what is being cooked and bought etc.'</i>
<b>Reduction in reported waste</b>	<i>'Waste hugely reduced'</i> <i>'Reduction in waste'</i>
<b>Introduction of food tasting and other food related activities</b>	<i>'Match letter of week to fruit / vegetables and have tasting of it; letter of the week; kept momentum going all year'</i> <i>'Food tasting - a lot of the time won't get to try those foods'</i> <i>'Mini chef works well; pictures at child level'</i> <i>'Introducing things slowly'</i>
<b>Introduction of and focus on health fluids</b>	<i>'Everything's going well, i.e. drinks tray becomes habit; fluid station'</i> <i>'Introduced water breaks, water on demand; as would go without otherwise'</i> <i>'Water station hard at start with spillage - encouraging pouring out own – habit now'</i> <i>'Made us more aware of how often they do need drinks in each room'</i>
<b>Positive self service experiences</b>	<i>'Self-service in older age group - decreased pressure on chef'</i> <i>'By November and December serving selves and pouring from jugs and spooning learned in Montessori'</i> <i>'Children like self service - building children's confidence - all around development; gives time to learn through snack time'</i> <i>'Allowing them to have time for choice'</i>
<b>'Family style food service' experience</b>	<i>'Aware of different types of food - talk about them. Meals are positive - look forwards to them - not a drama'</i> <i>'Children love self help and staff eating as a whole - very good'</i> <i>'Children like being 'king of the castle' and banqueting; having teacher sitting down and being a 'person''</i> <i>'Surprised at cups - thought there'd be more spillage - was great'</i> <i>'Socially; staff sitting down and joining in; staff didn't feel they could sit down'</i> <i>'Taking time, discussing what's for dinner, making dinner a fun experience'</i> <i>'Suggestion of eating with the children - training session very good'</i>

Etc., etcetera; / or.

**Table 5.14 Pre-schools managers' perception of difficulties in implementing change in the HIP project process**

<b>Themes</b>	<b>Quotes</b>
<b>Seamless physical activity</b>	<i>'Seamless activity; changing rooms around- work in progress'</i>
<b>Changing fluid and drinking habits</b>	<i>'water station hard at start - never done before'</i> <i>'took lots of time for change from cranberry to milk and water (only serve these now)'</i> <i>'parents bringing in juice in beakers when trying (in service) to bring in milk and water'</i> <i>'water station - didn't work - have outside instead - initial compromise'</i> <i>'stopped juice - unless child won't take it - hard to change habit'</i>
<b>Perception of staff attitudes, habits and routines</b>	<i>'Staff issues such as their opinions; being 'set in ways' about food and nutrition'</i> <i>'staff perceptions of food leading to children liking food less or taking dislike to food'</i> <i>'staff 'don't like change' - barrier initially'</i> <i>'staff don't want to eat as on diets etc, and busy trying to help so have not time to eat'</i> <i>'adults (staff) thinking about it more of barrier than children'</i> <i>'problem with feeding adults - so many adults - feel children would act up'</i>
<b>Perceived difficulties that arose for some providers when introducing self-service</b>	<i>'self service was going well and then lost staff - this was a challenge'</i> <i>'worked with morning and afternoon snack but didn't try self service with main meal'</i> <i>'Really hard at the beginning; no such thing as taking turns - all want it; need to reassure more available'</i> <i>'worried about the hungrier child taking too much'</i> <i>'serving selves - throwing food everywhere - mixture of age groups – tried and it works at afternoon meal'</i> <i>'struggle with younger children, worry hot food will burn them'</i>
<b>Overcoming children's food likes and dislikes</b>	<i>'hard to move children from frozen evening meals to fresh food (done now) not any harder to buy fresh vs. frozen'</i> <i>'reward scheme; getting them to try is the hardest; if try get sticker; 'laughing then' if they try'</i> <i>'getting children on to 3 week menu plan food, moving from plain to different foods- do like it now, majority ok'</i> <i>'varying menus was difficult and didn't work'</i> <i>'some food quite limiting - tried things - i.e. salad plate &amp; fish - wouldn't eat'</i>
<b>Apprehension of some providers about children using certain utensils</b>	<i>'Knives &amp; forks - apprehensive about using them- tried for 2-3 weeks - stopped using them'</i> <i>'knives a no, no'</i> <i>'beakers with no lids- didn't work - using free flow lids'</i> <i>'giving plates to all children - using them as Frisbees'</i> <i>'got knives and forks - found it very difficult - couldn't get right size for children'</i> <i>'cups with no lids in youngest age group'</i>
<b>Cost and wastage as an issue</b>	<i>'separating food on plates didn't work; tried for one day but led to wastage'</i> <i>'staff eating children's meals'</i> <i>'Not mashing vegetables into dinner - doesn't work, and parents want us to do it.'</i> <i>'time element of making sauces from scratch'</i> <i>'Waste of food from parents'</i>

Vs, versus; i.e., such as.

**Table 5.15 Pre-school managers' perception of main barriers post-intervention**

<b>Themes</b>	<b>Quotes</b>
<b>Cost +/- time</b>	<p><i>'time is expensive'</i></p> <p><i>'cost wise - chef cooking all day long; time &amp; motion for chef making food'</i></p> <p><i>'healthy menu on low budget'</i></p> <p><i>'staff eating with children – costing'</i></p> <p><i>'EECE scheme affecting service and fees charged; cutbacks because of EECE'</i></p> <p><i>'if getting more money would provide better / ECCE fees don't cover snacks - keeps doors open- makes difficult to provide healthy food – need to get parents to provide'</i></p> <p><i>'increase in children taking 'part time' full day care service places'</i></p>
<b>Dealing with parents</b>	<p><i>'Hard to deal with parents - parent notebook, but parents don't read it.'</i></p> <p><i>'parents don't seem to have the interest'</i></p> <p><i>'depends on group - parents working - convenience foods - children becoming accustomed to these taste'</i></p> <p><i>'if children are at home i.e. weekend or hols eating habits deteriorate'</i></p> <p><i>'hard to get time to talk to parents, you nearly need to make an appointment to see them'</i></p> <p><i>'only used to getting things can pick up with hands; things that are into oven or microwave and quick'</i></p> <p><i>'parents not giving children lumps -introduction healthy food harder'</i></p> <p><i>'hard to advise them on things; as do this and get attitude back- they know best'</i></p> <p><i>'parents pay bills - doing 'bad habits' at home'</i></p> <p><i>'dealing with parents; Triple P approach to introducing healthy eating; parents just see service as childminder'</i></p>
<b>Staff perceptions and habits</b>	<p><i>'staff have opinions &amp; no-one agrees on things; everyone has differing opinions on how much child should get'</i></p> <p><i>'all staff have differing opinions on how food service should be done in the crèche &amp; guidelines of crèche'</i></p> <p><i>'hit by staff shortages; no administration help so manager not on floor as much to oversee staff practice'</i></p> <p><i>'perception that children are eating 'too many times'</i></p>

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ECCE, Early Childhood Care and Education scheme.



## **5.4 Discussion**

The results of this study provide insight into nutrition and health related practice in this setting and to the outcomes derived from providing two levels of training to the pre-schools studied. A number of key findings were determined overall as part of this study. Firstly in the post-intervention phase, no significant difference was observed between the ‘manager trained’ and ‘manager and staff trained’ groups in the health promotion practices that were evaluated using the Pre-school Health Promotion Activity Scored Evaluation Form; suggesting that leadership quality may have played a substantial role in practice change in this setting. Secondly, significant improvements in health promotion practices occurred across two time points, from the pre-intervention to post-intervention phase, in both training groups. Thirdly, higher health promotion evaluation scores were achieved when self-assessment (subjective) compared to Research Dietitian (objective) assessment was undertaken using the Pre-school Health Promotion Activity Scored Evaluation Form.

These findings will now be explored and discussed in detail and will be related to the available literature that exists for each specific area examined in the study.

### **5.4.1 The effect of two levels of training**

The results in this study indicate that pre-school manager training is as effective in eliciting change in health promotion practice, as the provision of a more resource intensive staff training model, and is an extremely interesting and valuable one. Pre-schools were randomised into two training groups, one receiving a resource intensive intervention comprising of staff training in addition to manager education, and the

second getting an intervention which required significantly fewer resources, and which entailed training the manager of the pre-school only. This process enabled the analysis of whether staff training conferred any additional benefit on the outcomes measured. Contrary to expectation, the provision of staff training did not have a significant effect on the overall outcomes measured. This important finding could be related to the training of staff in this setting, or it may be linked to the positive impact of leadership on quality practice in the early years' setting (Sylva *et al.*, 2004; Siraj-Blatchford & Manni, 2006).

However, this result is extremely beneficial, particularly in the current economic environment in which resources are scarce. The added cost to the health service of providing staff training, and the difficulties in releasing staff for training from the pre-schools' perspective, have been demonstrated both in this study and have been acknowledged elsewhere (Shapiro Kendrick, 1994). From both the pre-schools' and health service' point of view the finding that 'manager only' training can deliver results equivalent to a more intensive intervention is an extremely welcome one. A point of further research here would be to establish why this might be the case.

## **5.4.2 Improvement in practice across two time points**

### ***5.4.2.1 Policy***

Data from studies in Irish, American and British pre-schools have depicted a marked variation in the prevalence of written health related policy (McWilliams *et al.*, 2009; Jennings *et al.*, 2011; Parker *et al.*, 2011), however these data are based on manager reports and not independent observation. The vast majority of pre-schools (*n* 39) in the pre-intervention phase of this study failed to display any written evidence of whole pre-

school health promotion policy and this finding is similar to another observation study in the United Kingdom which found only one of six centres studied had developed a healthy eating policy (Lloyd-Williams *et al.*, 2011).

It is recommended that having a policy enables the manager, staff, parents, carers and children to understand: the pre-school's approach to food provision and food learning and that policy should always be posted in a visible location (School Food Trust, 2012). Indeed studies has shown that there is a link between the presence of a written policy and health related practices such as provision of healthy or unhealthy food (Vereecken *et al.*, 2008; Parker *et al.*, 2011) and physical activity (McWilliams *et al.*, 2009).

While a significant improvement in practice was seen post-intervention in both intervention groups, with more than half of pre-schools observed to display healthy policy; less than 10% of each group obtained a 'best practice score' reflective of displaying policy created using the 'whole pre-school' approach to policy development, and containing information on all aspects of the pre-school environment: physical activity practice; food; nutrition practice; dental health and confidence. This finding is somewhat lower than the parental (20%) and staff (26%) involvement in policy development reported by managers in a recent Irish study (Jennings *et al.*, 2011), perhaps reflecting the observation rather than reported nature of these data.

The intervention in this study included education on the importance of policy development and outlined suitable methods to develop such policy (Department of Health and Children (Ireland), 2004; School Food Trust, 2012). Results suggest that the majority of pre-schools in this study are moving towards attaining a 'best practice' standard. To achieve this it is imperative that pre-schools facilitate the policy development methodology suggested. If a pre-school does not include all members of

its community in the development of an health related policy there is less likelihood of the policy being an effective tool for health promotion (Southern Health Board (Ireland), 1999).

Interestingly, preschool managers in this study reported that staff attitude affected their ability to implement healthy changes, suggesting that staff were ‘*set in ways*’ and ‘*don’t like change*’. As staff are more likely to model healthy behaviours when a written health policy encouraging such behaviour is in place (Erinosho *et al.*, 2012), it may be speculated that the exclusion of staff from policy development in some pre-schools in this study, may have precluded them from fully engaging in health promoting behaviour and may have led to resistance to practice change.

With some pre-school managers reporting that dealing with parents was one of the main barriers to healthy food provision; introduction of policy with clear guidance on permitted pre-school foods, and inclusion of parents in the development of such policy, would aid all pre-schools in their attainment of a ‘best practice’ standard in the future.

#### ***5.4.2.2 Food related education materials***

Few ‘food related education materials’ were observed in the majority of pre-schools in the pre-intervention phase of this study. Only one pre-school achieved a ‘best practice’ standard; displaying at least three different types of food related education materials in each pre-school room and in the corridors of the pre-school. This finding was worrying, as a child’s food associated learning has been shown to impact on food choices made in later life (Department of Health and Children (Ireland), 2004). While it is recommended that learning about food should be linked into the curriculum of the pre-

school, and can include many diverse aspects such as literacy, physical development or arts and design (Contra Costa Child Care Council, 2006; School Food Trust, 2012), results of this study would suggest that pre-intervention food learning was not facilitated therefore preventing children's discovery and understanding of food.

There are many aspects that can be focused upon to engage young children in the pleasant and social nature of meal and snack times, such as the provision of comfortable dining facilities and the hanging of colourful pictures of different foods and Food Pyramid posters at child level (Gable & Lutz, 2001). In this study, pre-schools in each intervention group had significantly improved their practice post-intervention, with approximately half the sample in each group progressing to a 'best practice' standard. The provision of such an environment in these pre-schools, that supports this learning, is extremely important and is very much to be welcomed.

#### ***5.4.2.3 Physical activity***

Pre-intervention the majority of pre-schools in this study attained a 'minimum standard' score, reflecting that some but not all children were participating in planned physical activity. Older children were more often engaged in physical activity than younger children, however, in six pre-schools, no planned physical activity whatsoever was observed. Considering that young children who participate in regular physical activity get immediate and long-term health benefits (School Food Trust, 2012) these findings are somewhat concerning.

These results are, nonetheless, similar to those of studies carried out in pre-schools in the United States, with Hudson *et al.*, (2009) noting that play levels did not meet with national guidelines for physical activity in the pre-schools which they studied, and Pate *et al.*, (2004) who reported that physical activity levels varied greatly

depending on the pre-school attended, with policy on physical activity significantly associated with moderate to vigorous physical activity levels.

While the ‘manager trained’ group significantly improved physical activity practice ( $P=0.035$ ) post-intervention, no such improvement was observed within the ‘manager and staff trained’ group; perhaps reflecting the higher percentage of pre-schools at ‘minimum standard’ level pre-intervention. In this study a ‘best practice’ score is attained when: all infants and children participate in planned physical activity; a physical activity timetable is clearly displayed; and child driven ‘seamless’ physical activity is facilitated. Considering only eight pre-schools provided seamless activity post-intervention, it was perhaps the latter element of this standard that prevented ‘best practice’ score achievement in many cases. Budget constraints and staff shortages reported by managers may also have had a bearing on such activity: ‘*seamless activity; changing rooms around – work in progress*’, suggesting that this practice may take a longer time period to be introduced.

Many physical advantages are associated with children partaking in physical activity including: building muscle strength and development of balance and co-ordination (Health Promotion Agency for Northern Ireland, 2005). The development of motor skills in young children is extremely important, and such skills should be nurtured through unstructured and structured play (Riethmuller *et al.*, 2009) with physical activity in the child care setting encompassing all types of movement (School Food Trust, 2012). Taking into consideration the beneficial effect of a physical activity intervention on obesity prevention in this setting (Fitzgibbon *et al.*, 2005), and that children’s physical activity levels have been positively associated with attainment of high quality scores in pre-schools (Bower *et al.*, 2008; Dowda *et al.*, 2009), the results

of the Healthy Incentive for Pre-schools project suggest that it has the potential to increase physical activity and thus prevent obesity in this population.

#### ***5.4.2.4 Outdoor time***

It was very perturbing that only two of forty two pre-schools provided children with adequate outdoor time, outdoor clothing and outdoor footwear in the pre-intervention phase of this study. Although little is published on outdoor activity in this setting; in a recent study in the United States, pre-school managers reported that approximately 50% of toddlers in childcare centres spent less than 60 minutes per day participating in outdoor time (Tandon *et al.*, 2012), suggesting that provision of limited outdoor time may not be confined to the present study.

The significant improvement in practice post-intervention in this study is to be appreciated, with a greater than 50% increase observed in the number of pre-schools providing outdoor time for all children. Indeed there was a rise in the number of pre-schools attaining a ‘best practice’ standard, with approximately one third overall providing sufficient outdoor time, clothing and footwear to facilitate such activity. Despite this welcome finding, however, three pre-schools did remain at a ‘not minimum standard’ level and the majority maintained a ‘minimum standard’ score. A number of reasons may explain these results, and looking to other research may provide answers.

Pre-school providers have reported that lack of suitable outdoor clothing and footwear are barriers to outdoor time for children (Copeland *et al.*, 2009; Copeland *et al.*, 2012). The lack of wellie provision in particular post-intervention may be a limiting factor in facilitating outdoor time, particularly with the rain inherent in the Irish climate. In fact there is a need for more research into parents’ and childcare workers’ attitude to the influence of weather on outdoor play. The Scandinavian proverb: ‘*there is no such*

*thing as bad weather, only bad clothing*' is used in Nordic pre-schools to encourage outdoor activity (Trondheim University of Science and Technology, 2013). The development of a good rapport with parents has been cited as the most appropriate way for staff to encourage parents to provide appropriate clothing (Copeland *et al.*, 2012). Although culture may have played a role in this study, it is important that Irish parents and childcare workers are apprised of the importance of outdoor play, and Irish children are given the opportunity to participate in such play while in the childcare setting.

There would also appear to be an hypothesis that children will get sick if exposed to outdoor conditions. Copeland *et al.*, (2011) recommend that to change this attitude, the importance of outdoor play should be outlined to parents by doctors, and pre-school providers should be encouraged to provide adequate opportunities for outdoor time everyday. Another expression, used in early education centres in countries such as Canada (St.Mary's School, 2013; West De Pere Schools, 2013), aims to ensure children are facilitated with outdoor time everyday: *'if a child is well enough to be in pre-school he / she is well enough to go outside'*. Both these terms were introduced to the pre-schools in this study and were reported anecdotally by providers to be beneficial in encouraging parents to both supply appropriate clothing and to allow their children to participate in outdoor activities everyday.

Another impediment may have been providers' concerns about safety and injury; both of which have been documented elsewhere (Copeland *et al.*, 2012). There is a growing debate, however, that limiting children's opportunity to explore the natural outdoor environment, and provision of only 'safe' plastic and rubber type playgrounds for children to play within, affects their ability to develop motor skills and fitness. Increased balance and co-ordination abilities have been found to be significantly associated with access to outdoor natural environments (Fjørtoft, 2001). In



Scandinavian countries there is a greater emphasis on affording outdoor time for children (Fjørtoft, 2001) with many '*friluftsbarnehage*', or outdoor kindergartens, being established, particularly in Norway (Kaarby, 2004). In contrast to the outdoor practice demonstrated in this study, it is interesting to note that in countries such as Norway spending time outdoors is the norm and education is incorporated into this time (Kaarby, 2004).

Two further reasons recently outlined by Copeland *et al.*, (2012) may also have influenced the sample of pre-schools in this study, preventing the majority from reaching a 'best practice' standard. Firstly, financial constraints may have prohibited pre-schools from spending money on outdoor environments. Secondly, parents would seem to be more concerned with their children's learning than outdoor activity participation, with providers recently reporting that they feel it necessary to justify outdoor activity to parents by relating it to learning in the playground (Copeland *et al.*, 2012). In this study, providers alluded to parent ambivalence noting that '*parents don't seem to have the interest*' in what their children do during the day. It has been noted that parents in many Anglophone countries, such as the United Kingdom, the United States, and therefore conceivably Ireland, do aim to progress their young children very quickly in academic endeavours (Druckerman, 2012). This is in marked contrast to their counterparts in France (Druckerman, 2012) and Scandinavia, where the focus in early childhood is on play and discovery (Fjørtoft, 2001; Kaarby; 2004; Skjalgstova Kindergarten, 2011). It could be hypothesised therefore, that providers in this study may have focused and prioritised that which they feel is expected by parents, the progression of academic achievement, rather than on the provision of outdoor time. Indeed, it is very interesting to note that in a recent study of children in non-parental

childcare in Ireland, 90% of mothers reported that their 3 year olds were learning numbers and letters in their childcare facility (Growing Up in Ireland, 2011).

#### ***5.4.2.5 Food as a reward or a treat***

It is recommended that food is neither used as a reward nor a treat for children, as to do so may negatively impact on the relationship that a child may develop with food (American Academy of Pediatrics & American Public Health Association, 2002). It was quite disquieting to establish that pre-intervention, approximately one third of services in this study were observed to use food rewards such as: ‘treat day Fridays’ on menus; staff using verbal prompts of food as rewards at mealtimes; or provision of ‘junk’ type food on celebration days. This level is higher than that reported by managers in a telephone based questionnaire survey carried out in Irish pre-schools, where only one quarter of pre-school managers said that they used food as a reward ( $n = 14$ ) (Jennings *et al.*, 2011). This may in part be explained perhaps by the observed versus reported nature of these findings.

Post-intervention, it is important to note that while three pre-schools remained at a ‘not minimum standard’ level; the vast majority attained either a ‘minimum’ or ‘best practice’ standard. However, only pre-schools within the ‘manager trained’ group were observed to display a significant improvement ( $P=0.007$ ). The creation of policy that includes guidelines on the use of food as a reward has been found to be an important determinant of improved practice in the primary school sector in the United States (Turner *et al.*, 2012). With this in mind, the introduction of appropriately developed policy, incorporating guidelines on the use of rewards, would enable pre-schools to prevent food being used as a reward in this setting and would encourage the use of non-food celebration ideas. In Scandinavia, for example, the policy of pre-schools

specifically outlines their stance on celebrations, where the aim of the celebration is ‘*to bring the child into focus*’, and celebration centres on raising a flag, having birthday songs and the child wearing a birthday crown (Skjalgstova Kindergarten, 2012).

#### **5.4.2.6 Adequate meals and snacks**

The composition of meals and snacks observed in this study was very variable with only one pre-school pre-intervention providing the recommended number of meals and snacks for children in full time care (Department of Health and Children (Ireland), 2004). This finding is of extreme concern when one considers the importance of providing adequate nutrition for children in full day care services and the effect that inadequate nutrient provision may have on growth and development (Koletzko *et al.*, 2011). Although an improvement in practice was observed post-intervention in both training groups, only the ‘manager trained’ group significantly improved practice and the majority of pre-schools in both groups maintained a ‘not minimum standard’ level.

Possibly the barriers cited by pre-school providers give an insight into these findings, with some providers noting that they felt that children eat ‘*too many times*’ and that ‘*time is expensive*’. Perhaps there is a poor level of understanding, despite the training provided in this study, of the need to change both the number of food groups in ‘meals’ and ‘snacks’; and the numbers of food episodes that should be provided within a full day care service. Considering the comments made, there may be a negative influence at play whereby providers may link increasing food groups or episodes with risk of childhood obesity. However, this apparent lack of understanding and attitude may also stem from the fact that the number of food groups that should be included in a ‘meal’ and a ‘snack’ are not clearly defined for Irish pre-schools (Department of Health and Children (Ireland), 2004) and there is no specific requirements in this regard

outlined in the national inspection regulations (Health Service Executive, 2006). In contrast pre-school guidelines available in the United States clearly outline the number of food groups that should be included in meals and snacks (Benjamin, 2007), and United Kingdom guidelines too include such information in a very in-depth format (School Food Trust, 2012).

To increase transparency for pre-schools and parents, and to ensure that children are being provided with sufficient food during the pre-school day, this lack of guidance is an issue that needs to be addressed at a national level in Ireland. Interestingly, Padgett and Briley (2005) noted that if pre-school food regulations are not specific it is possible for pre-schools to be compliant with these regulations but to fail to provide adequate food. It is for us as adults to provide sufficient nutritious food for children and it is then their choice to eat from this (Satter, 2012). If menus are devised that lack the basic structure needed to provide sufficient food, the children attending such institutions will be at a nutritional disadvantage.

It is also quite alarming to note that while within the 'Free Pre-school Year in Early Childhood Care and Education' scheme there is a need for pre-schools to adhere to quality frameworks, with increased per capita funding available if staff members with higher qualifications are employed, there does not seem to be similar provision aimed to ensure the supply of adequate nutritious food. Providers highlighted in this study that *'getting more money would provide better / ECCE fees don't cover snacks – keeps doors open – makes difficult to provide healthy food'* and noted that for this reason they get parents to provide snacks. However, providers then find it difficult to talk with parents about food or to encourage them to provide suitable snacks *'hard to advise them on things; as to do this and get attitude back – they know best'*. As the Irish government were in 2011 funding 4,162 services to provide the Free Pre-school Year

Scheme (Irish Department of Children and Youth Affairs, 2012), an increase of 10% in the number funded since 2010, and with the suggestion of extension of this scheme to encompass more ages of children in the future, it is fundamental that adequate budgetary provision should be made to enable pre-schools to provide children with appropriate healthy snacks. There is also a need to encourage and support pre-schools to participate in health promotion practice through assessment of its quality. Funding should be provided to those who meet quality health promotion standards, rather than to all who attain just a basic standard, as would appear to be the case at present. It is interesting to note that of the 4,162 pre-schools that obtained funding for provision of the Free Pre-school Year Scheme, 85.4% met basic capitation criteria and 14.6% met the higher capitation criteria (Irish Department of Children and Youth Affairs, 2012).

#### ***5.4.2.7 'Family style food service'***

'Family style food service' is a multifaceted approach to the management of mealtimes (American Academy of Pediatrics & American Public Health Association, 2002; National Food Service Management Institute (United States), 2003; National Food Service Management Institute (United States), 2010). Disappointingly, pre-intervention, no pre-schools were observed to follow all aspects of 'family style food service', thereby failing to reach a 'best practice' standard. In addition to this a surprising number of services failed to reach even a 'minimum standard' on the Pre-school Health Promotion Activity Scored Evaluation Form. Considering that the experience of food in childhood (Singer *et al.*, 1995; Batsell *et al.*, 2002; teVelde *et al.*, 2007) impacts on long term associations with food; the meal time experiences of children in these settings may have long reaching and effects on food habits into their future.

Post-intervention, however, a significant improvement in practice was observed in both intervention groups with over half of pre-schools reaching a ‘minimum standard’; reflecting that they were exhibiting at least four aspects of ‘family style food service’ in their pre-school. This finding is similar to Gable *et al.*, (2001), who observed and reported that most meals in Head Start pre-schools in the United States are offered in a combination of pre-prepared and family style, and Nahikian-Nelms (1997) who observed true ‘family style food service’ in only 2 of 24 pre-schools studied. While a recent Irish study of pre-schools did not specifically look at the provision of ‘family style food service’, managers reported that 11% provided peer modelling and 20% encouraged children to eat if fussy eating was an issue (Jennings *et al.*, 2011).

Interestingly, in this study, there was a variation in the number of pre-schools participating in the various practices introduced as part of the ‘family style food service’ standard. While there was greater than 50% increase in the number allowing all children in all rooms to participate in preparation, service and clean up of meals; the number who discussed food and nutrition during meals increased only by approximately one third suggesting that pre-schools perhaps found some aspects of ‘family style food service’ easier to implement than others.

However, the shift towards provision of ‘family style food service’ observed in this study is to be welcomed, due to the positive impact that it can have on children’s attitude to food and consumption of different food flavours, textures and tastes (American Academy of Pediatrics & American Public Health Association, 2002; National Food Service Management Institute (United States, 2003). Its implementation has also been associated with increasing children’s intake of nutritious foods (Donnelly *et al.*, 2000; Fitzpatrick *et al.*, 2007) and decreasing wastage (Donnelly *et al.*, 2000). Although there was genuine delight expressed by some managers regarding the positive

impact that this form of food service had on the children *‘meals are positive – look forward to them – not a drama’*; *‘children like being ‘king of the castle’ and banqueting; having teacher sitting down and being a ‘person’*. Others suggested that staff attitude had a potentially negative impact on implementation of such food service change *‘all staff have differing opinions on how food service should be done in the crèche and guidelines of crèche’* and that *‘adults (staff) thinking about it more of a barrier than children’*.

There are many specific guidelines available regarding the importance of staff sitting and eating with children, so to engage with them to develop a positive sociable and learning experience (School Food Trust, 2012) with guidance on staff to infant / child ratios necessary and the many pertinent reasons for the need for close interaction and supervision (American Academy of Pediatrics & American Public Health Association, 2002). It is worrying, therefore, that in the pre-intervention phase of this only one pre-school attained a ‘best practice’ standard for sitting with children, while no pre-schools obtained this standard for staff eating with children. Although this phenomenon is not exclusive to Ireland, studies in the United States, both observational and report based, have demonstrated higher levels of staff sitting and eating with children (Nahikian-Nelms, 1997; Hendy, 2002; Sigman-Grant *et al.*, 2008).

As was observed for ‘family style food service’, both intervention groups significantly improved their sitting and eating practice, however, interestingly more pre-schools within the ‘manager trained’ group attained a ‘best practice’ standard for all three practices post-intervention, perhaps reflecting stronger leadership qualities of the managers in this group; high quality leaders being pivotal to positive staff practice change in this setting (Owens, 2007). However, managers suggested that there are a number of issues may prevent staff participating fully in the practice of sitting and

eating with children. Staff may not have felt able to sit with the children if they felt their manager was not supportive of this practice: *'socially; staff sitting down and joining in; staff didn't feel they could sit down'*. Staff may not wish to eat the food children are being served *'staff don't want to eat as on diets etc. and busy trying to help so have not time to eat'*. These findings in themselves pose a problem to children's learning about food, as to fully explore and discuss food with children and so increase their chances of liking a food, staff must be seen by children to try the food and to be able to discuss its taste and texture (American Academy of Pediatrics & American Public Health Association, 2002). If managers encourage their staff to have just a small amount of each food that the children are being expected to eat, discourse and discussion of such food would be facilitated through positive peer modelling.

Budgets, cost and behaviour may also be having an impact, with some managers noting that it would be too expensive to feed staff: *'staff eating with children – costing'*, alluding to the fact that this is a cost they do not wish to bear *'staff eating children's meals'* and perceiving that it may lead to unruly children *'problem with feeding adults – so many adults – feel children would act up'*. This is in marked contrast to comments made by other managers who suggested that *'waste is hugely reduced'*, a finding similar to that of Donnelly *et al.*, (2000) and that *'children love self help and staff eating as a whole – very good'*.

#### **5.4.2.8 Adequate time**

The duration of meals and snacks is influenced greatly by the caregiver; and the time spent reflects the perception of that person regarding appropriate mealtime duration (School Food Trust, 2012). The majority of pre-schools pre-intervention met a 'minimum standard' for time allocation, providing adequate time for some, but not all



age groups, and some but not all meals and snacks. While a very small number of services allocated sufficient time for all children at all food episodes ( $n = 4$ ) thus achieving 'best practice'. Guidelines for the pre-school setting suggest that meal and snack times should not be shortened to facilitate other activities (School Food Trust, 2012). Although post-intervention approximately one third of each intervention group had attained a 'best practice' score, only the 'manager trained' group's practice had improved significantly. The observed improvement in time allocated may well be linked to the introduction of 'family style food service'; to staff sitting and eating with children, and to the viewing of meal and snack times as an educational opportunity rather than a chore.

#### ***5.4.2.9 Self service, self feeding and appropriate utensil provision***

While thirty five pre-schools pre-intervention encouraged some children to self feed, only two encouraged all ages of children. Linked in with this finding was the fact that no pre-schools pre-intervention facilitated self service, or provided the requisite age appropriate utensils that are advocated to learn self feeding and drinking skills at the correct time and stage for development.

While it is recommended that infants should be introduced to a free flowing lidded, or unlidded cup at 6 months of age (Health Service Executive, 2005; Food Safety Authority of Ireland, 2012a; Irish Nutrition and Dietetic Institute, 2012), and that by 12 months of age an infant should drink from a cup rather than a feeding bottle (Department of Health and Children (Ireland), 2004; Food Safety Authority of Ireland, 2012a), only one service pre-intervention was providing lidless cups to infants less than twelve months and only three provided lidless cups to those children aged 12-24 months. This finding is different to that of Jennings *et al.*, (2011) in which 46% of

managers reported the introduction of feeding beakers at 6 months; this dissimilarity perhaps due to the reported nature of these results, with managers perhaps recounting the use of all feeding beakers, regardless of whether they were ‘non spill’ or free flowing.

The low level of cup introduction is a cause for concern due to the potential effect this practice may have on risk of developing dental caries, iron deficiency and obesity. With speech and language development, and the potential for developing feeding problems in later life are also linked to this (Northstone *et al.*, 2002; Health Service Executive, 2005; Food Safety Authority of Ireland, 2012a; Irish Nutrition and Dietetic Institute, 2012; School Food Trust, 2012). Although it is advocated that food should not be put directly on to table surfaces, or directly onto the tray of a highchair, very few pre-schools in the pre-intervention phase of this study provided plates for snacks, with just one service providing plates for children less than 12 months, to fifteen providing plates for children aged over 36 months. This is a fundamental food safety concern and a missed opportunity for learning regarding the use of appropriate delph at food times (American Academy of Pediatrics & American Public Health Association, 2002).

The number of pre-schools providing appropriate utensils and cutlery was seen to improve to varying degrees within the various practice aspects measured (see **Table 5.12**). However, although practice improvement was observed across the two time points, this was not found to be significant in either training group. Barriers to project implementation suggested by pre-school managers may go some way to explaining the hesitation and include: a worry about how children would use utensils: ‘*knives a no, no*’; ‘*knives and forks – apprehensive about using them – tried for 2-3 weeks – stopped using them*’; ‘*giving plates to children- using them as Frisbees*’ and a difficulty in being

able to source adequate utensils '*got knives and forks – found it very difficult – couldn't get right size for children*'. The misuse of cutlery and delph at mealtimes is dependent on the learning which a child has received. The fear associated with introducing such basic everyday items as plates, knives and forks to children is surprising. Further investigation of this finding is warranted considering its potential impact on children's development. There is a need for further education of pre-school managers and staff, but also parents, regarding the importance of suitable utensil provision.

As studies have demonstrated that allowing children to serve themselves facilitates self regulation (Rolls *et al.*, 2000; Orlet Fisher *et al.*, 2003; Mrdjenovic & Levitsky, 2005) and that poor self-regulation and inability to delay gratification have been linked with weight gain (Francis & Susman, 2009; Seeyave *et al.*, 2009; Tsukayama *et al.*, 2010) it was very positive to see a significant improvement in self service practice within both intervention groups with over a third of each group obtaining a 'best practice' score. Facilitation of self service for children is recognised as the gold standard (National Food Service Management Institute (United States), 2003; National Food Service Management Institute (United States), 2010) which enables children to take responsibility for their food (Satter, 2012). While it may be difficult for staff to move from a 'controlling' role to one which allows the division of responsibility for food service (Lohse *et al.*, 2012; Satter, 2012) this transition can help to ensure adequate food provision by staff and food consumption by children. It is interesting to note that post-intervention the 'manager and staff' trained group attained a significantly higher scores ( $P=0.045$ ) in self service than the 'manager trained' group. This finding perhaps suggesting that staff participation in the intervention training session may have better equipped them to test and feel confident in the practice of self service.

#### **5.4.2.10 Meals**

Relatively little data are available on food service in the pre-school setting, and although a number of studies have questioned providers about the food they provide to children (Jennings *et al.*, 2011; Lloyd-Williams *et al.*, 2011), relatively few have directly observed food served to, or eaten by children in full time care (Ward *et al.*, 2008b). It is concerning, therefore, to find that a large number of pre-schools in the pre-intervention phase of this study attained a ‘not minimum standard’, for their serving of vegetables, protein and dairy, with only three achieving a ‘best practice’ standard for iron provision.

Supporting pre-schools to provide appropriate healthy food has the capability of having a huge effect on the obesity levels amongst children in this setting (Fox, 2010). Therefore, the finding that both intervention groups significantly improved their protein and vegetable serving practice is to be hugely welcomed. It is somewhat worrying, however, that no significant improvement in iron provision in either intervention group was detected, when one considers the necessity of iron for brain development and the prevalence of iron deficiency anaemia in infants and young children (Lozoff *et al.*, 2000; Halterman *et al.*, 2001; Georgieff, 2007). As iron containing foods such as red meat can tend to be expensive and because cost is a consideration for pre-schools, the provision of grant aiding or meat vouchers for pre-schools may facilitate pre-schools to supply adequate iron for children, with such grants significantly improving nutritious food provision (Monsivais *et al.*, 2011).

Approximately half of services in both training groups maintained a ‘not minimum standard’ dairy provision score. This result may be due to the perceived cost of providing dairy foods at meal times, with managers noting the provision of a ‘*healthy menu on low budget*’ can be difficult to achieve. In stark contrast to this finding; a significant improvement in ‘provision of dairy food outside the main meal’ was

observed in both groups post-intervention, with over 75% of pre-schools achieving ‘best practice’. These results most probably reflect the fact that many pre-schools now encourage some sort of snack to be provided by parents; parental dairy provision as a snack would be in line with the Irish National Pre-school Nutrition Survey which found that dairy was perceived to be a staple food for this age group (Irish Universities Nutrition Alliance, 2012).

Interestingly, in the post-intervention phase significantly higher dairy ( $P=0.042$ ) and starch ( $P=0.041$ ) provision scores were noted in the ‘manager and staff’ trained compared to the ‘manager trained’ group. This finding may be linked to the significantly higher ‘manager and staff trained’ evaluation score observed for the ‘self service’ standard. It could be hypothesised that staff who had participated in training may be somewhat more likely to facilitate children’s self service which may then enable children to improve their dairy and starchy food serving sizes.

#### ***5.4.2.11 Snack provision***

Pre-intervention approximately half of pre-schools provided (or parents provided) a ‘minimum standard’ of fruit, and two thirds provided, or allowed parental provision of ‘Top Shelf’ Food Pyramid foods for children, this is similar to the findings of Jennings *et al.*, (2011) in which 68% of pre-schools reported serving unhealthy snacks during the day.

Post-intervention, the majority of providers in both groups were observed to attain a ‘best practice’ standard and to significantly improve their practice in relation to the provision of an appropriate serving of fruit for children. No significant change in practice was determined, however, in the provision of ‘top shelf’ foods in either group across the two time points measured. This finding may have been due to the parental

provision of snacks described by pre-school managers, and may be related to pre-school staff feeling that '*parents pay bills – doing 'bad habits' at home*', making it difficult for them to prevent such 'bad habits' coming into the pre-school.

The Food and Nutrition Guidelines for Pre-schools (Department of Health and Children (Ireland), 2004), however, outline that the food given to children in the pre-school is the responsibility of the pre-school provider and Sweitzer *et al.*, (2009) recommends that if parents provide inappropriate snacks, providers should address this with them. For this reason, pre-school providers need to use the whole pre-school approach to health policy development ensuring that it includes their health promotion stance on 'Top Shelf' food provision. Development of pre-school provider confidence in dealing with parents with regard to healthy practice is warranted. Although parents '*pay the bills*' the ultimate responsibility for nutrition and health practice in the pre-school rests with the provider and so they need to ensure that best practice is being followed.

#### ***5.4.2.12 Fluid provision***

Although milk and water are encouraged as the most tooth friendly drinks for infants and children (Department of Health and Children (Ireland), 2004), and calcium found in milk is recommended for the prevention of osteoporosis (Nicklas, 2003), many children are consuming other drink types (Petter, 1995; Marshall *et al.*, 2005), with pre-intervention practice in this study being no different. A high proportion of services were observed to provide inappropriate drinks such as juices, juice drinks and squashes at snack times (*n* 39); inappropriate drinks with meals, such as undiluted juice, juice drinks and squashes (*n* 22); and provision of access to water or milk, between meal and

snack times, was thoroughly inadequate, with the majority of services ( $n = 37$ ), providing no access to fluids between meals.

Post-intervention, however, a significant improvement was seen in the provision of appropriate drinks at snack times and the provision of fluids between food times, the majority in both groups attaining a ‘minimum standard’ score in each of these criteria. This finding is similar to that observed by Erinoshio *et al.*, (2011) who reported that where less than half of pre-schools provided accessible water throughout the day, but are in contrast with the practice reported by managers in Dublin pre-schools who stated that drinks were served on demand in all pre-schools (Jennings *et al.*, 2011); perhaps suggesting that the observation based findings might be a more true reflection of actual fluid provision practice in this setting.

Post-intervention, while the majority of pre-schools in each group attained a ‘best practice’ score for the type of drinks provided at mealtimes; significant improvement ( $P=0.005$ ) was only observed in the ‘manager trained’ group. Further encouragement of pre-schools to provide milk, would improve both the standard of fluids provided, and the supply of dairy with the main meal, which was found to be missing from the majority of pre-schools’ ( $n = 24$ ) in the post-intervention phase of this study. Although there is a subsidised milk scheme in Ireland, in which community pre-schools may participate, informal feedback from services suggests that the provision of milk in small containers was not suitable for this age group as it led to much wastage. Pre-schools recommended that instead the scheme should cover the provision of large milk dispensing containers with tetra pack refills, as are used by restaurants. A number of community pre-school managers also mentioned that they had discontinued using the scheme as it was cheaper to go to the local supermarket and get own brand milk than to get the ‘subsidised’ milk from the Department of Agriculture scheme.

As drinking habits are generated in childhood, it is necessary to encourage children to learn to drink suitable fluids and to develop healthy practices (Benelam & Wyness, 2010) and prevent the development of diseases such as osteoporosis (Benjamin, 2010). It is imperative that there is a public health policy that aids this. Delivery of a milk subsidy scheme that is not perceived by community pre-schools to be user-friendly, and which does not provide any incentive at all to private pre-schools to provide milk, needs to be reassessed.

While water should be available for children throughout the day (American Academy of Pediatrics & American Public Health Association, 2002), and children should be encouraged to serve themselves with this water, this study found that children were being provided with drinks other than milk and water. This finding is not hugely surprising, with other research in Ireland noting that over 50% of a sample of mothers studied, provided juice rather than water for their six month old children and a proportion also provided sugar containing supplementary fluids (Tarrant *et al.*, 2010). A separate Irish telephone survey of 54 pre-schools managers, reported that milk, water, fruit squash, diluted and undiluted fruit juice were served during the day both with meals and between meals and snack times (Jennings *et al.*, 2011), a finding of practice similar to that found in this study.

#### **5.4.3 Self assessment and observation based assessment**

While a number of initiatives (Benjamin *et al.*, 2007a; Bravo *et al.*, 2008) have in the past relied on self assessment of practice, the limitation of such methodology has been acknowledged (Lanigan, 2012); with direct observation being described as a ‘gold standard’ (Gittelsohn *et al.*, 1994). The results of this study would confirm the need to interpret any findings based on self assessment with caution, with those scores assigned



by self assessment significantly higher than those conferred by direct observation. Although similar generous self reported scoring has been observed in other studies (Benjamin *et al.*, 2007a; Honisett *et al.*, 2009), as it was not possible to test inter-rater reliability in this study, the higher self-assessment scoring could also perhaps be attributed to pre-school staff's inability to use the Pre-school Health Promotion Activity Scored Evaluation Form as a measurement tool rather than due to 'optimistic bias' on their part. For this reason a future study is warranted to investigate the inter-rater reliability of the Pre-school Health Promotion Activity Scored Evaluation Form.

Use of the Pre-school Health Promotion Scored Evaluation Form has enabled the gathering of data in the pre-school setting and has added to evidence available on the use of observation based environment and policy assessment tools in this setting (Ball *et al.*, 2007; Ward *et al.*, 2008b; Schwartz *et al.*, 2009; Falbe *et al.*, 2011; Lanigan, 2012). This study's findings make a case for funding to be made available to enable independent observation to maximize the veracity of any results obtained as part of an overall initiative to encourage quality practice.

The motivational aspect of the Pre-school Health Promotion Scored Evaluation Form classification system in the Healthy Incentive for Pre-schools project is similar to that outlined by Sisson *et al.*, (2012) who determined that the star rating of child care centres leads to differences in best practice levels, with three star rated centres reporting higher frequency of such best practice standards, when compared to services with a lower star rating. In fact, a concern about quality in childcare provision has led to the development of quality improvement initiatives aimed at improving standards above the minimum. These aim to: provide accreditation; improve staff skills and qualifications; increase parent awareness and knowledge; and provide grants and subsidies linked to quality improvements (Mooney, 2007). In the United States, the introduction of

incentives and rewards such as the ‘Quality Rating System’ and a tiered subsidy reimbursement initiative motivates pre-school providers to exceed minimum standards set. The rating system provides information on programme standards, such as child-staff ratios and caregiver or teacher educational levels, to all those with an interest, such as parents. The system also affords enhanced funding for the better providers, who then receive more state child care financing to serve children (Organisation for Economic Co-operation and Development, 2006).

#### **5.4.4 Limitations of the study**

Potentially there are a number of limitations to this study that must be acknowledged. Firstly, rather than using the traditional method of dividing a study into two arms, control and intervention, in essence this research involved two training intervention levels. The decision to follow this study format centred on a number of reasons: to ensure maintenance of pre-school engagement in the project process; as ‘true control’ group contamination prevention would have been unfeasible in this setting; and because ethically it was determined, that to ensure best child welfare, all pre-schools in the study should receive an intervention.

Study results may also be limited by the fact that the data were collected in each service on one day only, pre- and post-intervention, and therefore may not be seen to fully reflect the practices of an individual pre-school on a weekly or monthly basis. However, as pre-schools were assessed on different days of the week, to determine an aggregate picture of practice, we are confident that the routines reported do reflect normal practice within the study pre-schools.

To heighten reliability, all observations were also made by one Research Dietitian, ensuring consistency of assessment across the 42 pre-schools observed.

Although this in itself may be considered a limitation, as it was not possible to determine inter-rater reliability; having even one extra ‘outside’ person in a pre-school setting may affect the inherent practice undertaken by staff; therefore, one researcher would cause minimal interruption compared to the effect of a team of researchers working in a single setting on a particular day. This study aimed to collect data, with minimal disruption to the staff or the children, an important consideration when planning any research activity in this setting; using observation, which is considered the most effective data collection method (Gittelsohn *et al.*, 1994) helped to ensure quality data were obtained despite the aforementioned limitations.

It could also be said that making an appointment to visit each pre-school at the pre- and post-intervention phases, essentially ‘prepared’ pre-schools to alter practice for the visit of the researcher and that this is a possible limitation. However, to counteract this possibility pre-schools were not advised of the specific components that would be observed on the pre-intervention visit day. Further, post-intervention, pre-schools had by then been trained and so were aware of standards expected, thus potentially impacting on results achieved. However, the practice observed could be said to reflect actual routines and habits as, by the very nature of the pre-school and the children cared for therein, it would be difficult to alter an everyday childcare approach within a two week period, as practices undertaken with this age group require much repetition and time to change (Cooke, 2007; O'Connell *et al.*, 2012).

Although the sample that completed all phases of the study may be regarded as small, which could be seen as a limitation, it is important to note that the population of full day care pre-schools in the Midlands of Ireland is finite. A good representation of community and privately owned services, with a wide geographical spread, was obtained despite the economic recession which evolved during the project process that

caused closure, and movement of pre-schools from full day care to sessional care service and which had not been anticipated during the project planning process. While this study was based in a relatively rural disadvantaged setting in the Republic of Ireland, it is possible that the practices observed pre-intervention may be present in pre-schools in other areas, and therefore the beneficial learning from this study could be applied to other pre-schools offering a 'full day care service', resulting in an improvement in the nutrition and health habits of a large number of children in full time care.

It may be suggested that a further limitation was the impossibility of determining inter-rater validation due to relatively poor rates of self assessment by pre-school providers and no assessment undertaken by the inspection team. The low levels of self-assessment by the pre-schools may have been due to the large workload experienced on a daily basis by this group. While the inspection team have assessment forms of their own to complete during their inspection visits that relate to the Pre-school Regulations (Department of Health and Children (Ireland), 2006). Addition of yet another form for completion would constitute an increase in this work load. Time constraints associated with the completion of pre-school inspections prevented the Pre-school Inspection Team administering the Pre-school Health Promotion Activity Scored Evaluation Form.

## **5.5 Conclusion**

This intervention was the first in Irish pre-schools to directly observe health related practice and demonstrate that introduction of an evaluation tool and education resource motivated improved practice with no significant additional effect of staff education.

Direct independent observation was confirmed as the optimum method of assessment for future intervention in this setting. Further exploration is needed to determine if the introduction of this project to other pre-schools offering a ‘full day care service’ in Ireland would encourage more pre-schools to follow best practice guidelines, thereby enhancing the quality of their nutrition and health environments.

## CHAPTER 6

# USE OF THE DELPHI TECHNIQUE TO DETERMINE PRE-SCHOOL PROVIDERS' FAVOURED INCENTIVE IDEAS FOR INCLUSION IN THE HEALTHY INCENTIVE FOR PRE-SCHOOLS PROJECT

### 6.1 Introduction

With nutrition (Singer *et al.*, 1995; teVelde *et al.*, 2007) and physical activity (Telama, 2009) habits that develop in childhood observed to track into adolescence and adulthood (Batsell *et al.*, 2002), the child care setting is well placed to provide an excellent opportunity to promote healthy energy balance, healthful eating (Story *et al.*, 2008), appropriate food (Briley & McAllaster, 2011) and physical activity habit formation (Connelly *et al.*, 2007). However, it would appear that little research has been undertaken to evaluate interventions to promote an improvement in the eating environment in this setting, a phenomenon which has been described as a missed opportunity to promote health (Story *et al.*, 2008).

To engage pre-school communities in healthy behaviours, it is necessary for those involved in the management of pre-schools, and those involved in their inspection, to prioritise healthy food habit development as important; as necessary as gross motor skill development, language, literacy and numeracy, and to ensure an environment that promotes healthful eating (American Academy of Pediatrics &

American Public Health Association, 2002). Ensuring that pre-school staff are competent and well trained is necessary and key to the early education environment, with the qualifications held by staff linked to quality of pre-school education provided (Sylva *et al.*, 2004; Siraj-Blatchford & Manni, 2006). Despite this, a wide discrepancy exists between the importance society purports to attribute to the role of early educators and statutory policies that fail to support this profession adequately (Early & Winton, 2001). With providers raising concerns about their relationship with parents regarding children's health related habits (Moore *et al.*, 2005; Taveras *et al.*, 2006; Jennings *et al.*, 2011), there is a need to develop confidence in pre-school providers, as a group, on their role in implementing best practice for children in relation to health. However, the knowledge and beliefs of childcare workers on their role in obesity prevention has received little research interest (Lanigan, 2012). While providers need more than training on best practice, they also need information on how and why they should comply with best practice standards (Clark *et al.*, 2008). Provision of training and professional development opportunities, or distribution of some type of compensation, have been suggested as the best strategies to encourage best practice (Benjamin *et al.*, 2009b), with the relative infrequency of site inspection visits by pre-school inspectors being deemed a disincentive as visit numbers are not sufficient to promote motivation to healthy practice.

Central to the philosophy of health promotion are the concepts of consultation (Sidell, 1999) and empowerment (Tones, 2001). Undertaking a needs assessment is pivotal to the 'health promoting schools' approach', and this process facilitates the experience of ownership by participants as their views, opinions and expectations are gathered and acknowledged (Jones *et al.*, 2000). Healthy award schemes in the school setting (Honisett *et al.*, 2009) developed using the 'health promoting school' concept

provide structured frameworks, health related targets and external support for schools; and while less common, this approach has also been advocated and used in the childcare setting (Pollard *et al.*, 2001; Honisett *et al.*, 2009).

One of the facets of the Healthy Incentive for Pre-schools project is the provision of an incentive for pre-schools to maintain their participation in the project. To foster pre-school provider engagement, and to facilitate empowerment, the project's National Advisory Group outlined the importance of undertaking a consultation with providers on the type of incentive they would like to receive as part of the project; incentives that would be useful, encourage participation and motivation.

In determining the most beneficial method to gather information, one must consider the endpoint that is required. Although interviews and postal questionnaires elicit information, their use does not allow for consensus on issues raised by participants. *'The Delphi approach involves the presentation of a questionnaire or interview schedule to a panel of 'informed individuals' in a specific field of application, in order to seek their opinion or judgement on a particular issue'* (McKenna, 1994); the main advantage of Delphi would appear to be the attainment of consensus in an area where there has previously been none, and participating in the process has been described as a *'highly motivating experience'* with the mechanism of feedback being seen as *'novel and interesting'* by those involved (McKenna, 1994). Indeed, it is thought to be a useful method to gain opinions from a large group of participants on a specific topic (Hasson *et al.*, 2000) rather than to gain in-depth analysis of an issue (Goodman, 1987). The technique has been successfully administered in many different fields such as: nursing education, nursing research, patient care management and standard setting (McKenna, 1994; McIlpatrick & Keeney, 2003; Löfmark & Thorell-Ekstrand, 2004), in health promotion (Whitehead, 2008), health care quality (Boulkedid



*et al.*, 2012) and nutrition research (Hemming *et al.*, 2011; Brody *et al.*, 2012), and to determine which outcomes to measure in clinical trials (Sinha *et al.*, 2011). In this study the evidence available in the literature (Goodman, 1987; McKenna, 1994; Hasson *et al.*, 2000) indicated that the Delphi technique would be the most suitable data collection tool to obtain consensus from a large and dispersed group of individuals in this setting.

The aim of this study was to use the Delphi technique to determine the pre-school managers' views on the types of incentives they would perceive to be of most benefit for inclusion in the Healthy Incentive for Pre-schools project.

## **6.2 Methodology**

### **6.2.1 Introduction to data collection methodology**

The Delphi technique has been described as a structured process that employs a series of questionnaires or 'rounds' to collect information from a group until that group comes to a consensus on the topic under research (Powell, 2003). The method used in this study was a 'classic' Delphi technique, '*which collects qualitative data in the first round and quantitative data in subsequent rounds*' (Keeney *et al.*, 2006) with each participant viewed as an 'expert' in the issue in which the research is undertaken. 'Experts' have been defined as '*informed individuals*' (McKenna, 1994), and as '*specialists*' or '*informed advocates*' in their area (Goodman, 1987).

A classic two round Delphi technique was used in this study to identify the incentives deemed most beneficial by pre-school managers enrolled in the Health Incentive for Pre-schools' project.

### ***6.2.1.1 Reliability and validity of the Delphi technique***

Reliability is defined as ‘*the extent to which a procedure produces similar results under constant conditions on all occasions*’. Although it has been suggested that there may be little evidence of reliability linked with the Delphi technique (Hasson *et al.*, 2000), an investigation which aimed to replicate a Delphi study carried out sixteen years previously, noted that the findings reflected those found in the previous study (Ono & Wedemeyer, 1994). Akins *et al.*, (2005) determined that the response characteristics obtained from a small sample of highly knowledgeable ‘experts’ (*n* 23) using the Delphi technique were stable when compared to computer generated ‘bootstrap’ results of 1000 and 2000 resampling iterations.

Hasson and colleagues (2000) suggest applying the criteria used for rigour in qualitative studies (Lincoln & Guba, 1985; Seale, 2002) to the Delphi technique: credibility (truthfulness), fittingness (applicability), auditability (consistency) and confirmability, to ensure a credible interpretation of gathered information is garnered. Powell (2003) proposes that one of the key methods to ensure credibility is to include a clear ‘decision trail’ to enable a defence of: the selection of the methods used to explore the research question, the ‘experts’ chosen; the method used to collect the data; the consensus level chosen for the study is justifiable and there is a means for dissemination and implementation outlined. In the Healthy Incentive for Pre-schools project such a clear decision trail has been included.

Goodman *et al.*, (1987) suggests face validity, a measurement of usefulness in terms of correctness, commitment and implementation (Powell, 2003), is improved as the researcher has no influence on the development phases of the survey; instead the nature and substance is participant driven accurately reflecting and examining the subject being studied. Using participants who are knowledgeable and interested in the

research topic may increase the content validity of the technique (Goodman, 1987), and using successive rounds in the process aids the concurrent validity. However, overall the validity of results is affected by response rates (Hasson *et al.*, 2000). In this study, the pre-school providers have the most insight into practice in the pre-school setting and the items that would be of most value to them in motivating best practice; therefore, the validity of the information determined is strong.

#### ***6.2.1.2 Consensus and the Delphi technique***

There does not seem to be general consensus on the statistics that should be used to describe the descriptive data generated, with Rowe & Wright (1999) noting from their systematic review of the literature on the Delphi technique, that many different statistics can be used, including median, mode, percentage, rank, upper and lower quartile ranges. Use of the mean to represent group opinion and standard deviation as a representation of the amount of disagreement was suggested by Greatorex & Dexter (2000). However, Murphy *et al.*, (1998) contradict this, suggesting that median and interquartile range are more robust than the use of standard deviation. Using mean as a central tendency to reflect group opinion and standard deviation as a measure of spread can be useful, with a low standard deviation reflecting expert panel agreement (Hanafin, 2004).

#### ***6.2.1.3 Ethical considerations and the Delphi technique***

The Delphi technique is subject to the same ethical considerations as any postal questionnaire; it cannot be ensured that the person who completes the questionnaire is the intended recipient, or whether discussion of questionnaire responses has taken place with other individuals (Keeney *et al.*, 2001). Complete anonymity cannot be guaranteed

with the Delphi technique, as it is necessary for the researcher to identify responses to enable successive rounds to be forwarded to the correct individuals, and the researcher must be able to identify responders and non-responders (Hasson *et al.*, 2000; Keeney *et al.*, 2006). However, the phrase ‘quasi-anonymity’ has been coined to suggest that although participants are known to the researcher and that participant ideas are shared among all participants through the process, that at all times participants’ opinions and judgements remain strictly anonymous (McKenna, 1994).

## **6.2.2 Rounds**

### ***6.2.2.1 Consensus level and number of rounds***

The number of rounds and the consensus level would appear to be intrinsically linked. *‘The number of rounds depends on the amount of time available, whether the researcher has indicated the Delphi sequence with one broad question or with a list of questions, and consideration of levels of sample fatigue’* (Hasson *et al.*, 2000). It would appear that there is no universal agreement in the literature as to the level of consensus for which to aim, with recommended values ranging from 51% to 80%. The level used depending on the aim of the research, the resources available to the process and the sample numbers; knowing when to stop is noted to be crucial (Hasson *et al.*, 2000). As there is no universal guidance on the most appropriate level of consensus, the level of consensus in this study was set at 70%, in accordance with that recommended by Keeney *et al.*, (2006); preferred incentive ideas generated were identified as a priority only when 70% of the ‘expert’ group had reached agreement.

### *Round one*

The first round questionnaire is usually unstructured and consists of open ended questions, encouraging openness and freedom of response (Hasson *et al.*, 2000; Keeney *et al.*, 2001; Powell, 2003). The first round of questionnaires in the Delphi process in this study was posted to all pre-school providers enrolled in the Healthy Incentive for Pre-schools project (*n* 45) in December 2011 (**Appendix 28**). The questionnaire was accompanied by a stamped addressed envelope and a letter (**Appendix 26**) and an explanation sheet (**Appendix 27**). One question only was included on the round one questionnaire; the question was qualitative and open ended ‘*As a manager of a full day care pre-school, what incentives would you choose for the Healthy Incentive for Pre-schools’ (HIP) project that would make the project more attractive to you as a manager?*’ Each pre-school service that had not responded by late December was followed up with a telephone call reminder in January 2012.

### *Round two*

To create the second round using the Delphi technique, the results of round one must first be analysed (Hasson *et al.*, 2000). In this study, all responses gathered through the qualitative first round of the process were analysed and similar ideas were grouped together. All ideas, and the groups into which they were placed for round two, were considered by the National Advisory Group and the Local Expert Group.

A new round two questionnaire was developed (**Appendix 30**) that comprised a table of the grouped ideas together with a Likert scale. The five choice Likert scale aimed to assess the value placed by the participants on the grouped items suggested in round one. The participants were required to indicate the ‘helpfulness’ of the Delphi round two survey items from 1 to 5, where ‘5’ represented items that were deemed as

'*very helpful*' to the participant pre-school managers, and '1' represented items that were perceived by them to be '*very unhelpful*'. This questionnaire was distributed with an explanatory letter (**Appendix 29**) in March 2012 to all pre-school providers who had replied to the round one questionnaire.

### **6.2.3 Sample selection**

All pre-school managers who had participated in phase 3 (pre-intervention data collection) and phase 7 (post-intervention data collection) of the Healthy Incentive for Pre-schools project were invited to participate in the Delphi process ( $n = 45$ ); including those who had received feedback by post only, and who had participated in the phase 7 data collection visit ( $n = 3$ ). These participants were not chosen randomly, but were selected for the purpose of investigation of their knowledge and opinion on the research under question (Hasson *et al.*, 2000).

#### **6.2.3.1 Informing the sample**

If the participant sample has an understanding of how the Delphi technique works, that knowledge leads to a better research relationship which can improve the response rate in the second and subsequent rounds (Hasson *et al.*, 2000).

In this study, all pre-school managers were introduced to the concept of the Delphi technique during the project's phase three (pre-intervention data collection) and phase seven (post-intervention) data collection visits; the researcher verbally discussed the process aim and methodology, including what the pre-school managers would be expected to do, the time commitment and how the information gathered would be used. Written information on the process (**Appendix 26** and **Appendix 27**), in the form of a

letter, was then sent out with the Delphi first round questionnaire as recommended (Hasson *et al.*, 2000).

#### **6.2.4 Data analysis and statistical interpretation**

Data analysis from the Delphi technique is both qualitative and quantitative in nature. The data obtained from round one was qualitative and analysis of these data involved the grouping of ideas and opinions. No items were omitted and, apart from minor edits, the wording used by participants for their ideas was again used in round two of the process.

In round two, quantitative evaluation of results was undertaken. The rating assigned to each item by each participant were collected, coded and inputted in the Statistics Package for the Social Sciences (SPSS) for Windows, Version 20 (SPSS Inc., Chicago, Illinois, USA). All statistical analysis was carried out using SPSS and statistical summaries for each idea were thus produced. The 70% consensus level that had been set was used as the cut-off for inclusion of preferred participant ideas. Chi square analysis was undertaken to compare groups. Mann-Whitney *U* tests were carried out to determine whether differences occurred between responders and non-responders. Results were considered significant at  $P < 0.05$ .

#### **6.2.5 Ethical considerations**

While the potential for harm could be considered relatively low using this survey technique, as the participants are independent adults considered experts in their own field, other ethical issues needed to be considered such as consent, privacy and confidentiality of data.

Verbal and written information (**Appendix 26** and **Appendix 27**) were provided to all participants in the study and written consent was obtained from each ‘expert’ participant before the collection of data was commenced. Quasi-anonymity was assured in this study by allocating a code to each participant at the beginning of the process, thereby ensuring the researcher could identify responders and non-responders. All ideas generated in round one were grouped by the researcher and participants’ responses were not identified when these were included in round two.

## **6.3 Results**

### **6.3.1 Response rates**

The initial response rate to the first round of the Delphi process in December 2011 was 31% (14 of 45). A reminder telephone call was made to each service in January 2012. Twenty three of the eligible 45 pre-schools (51%) completed the round one Delphi survey. Twenty of the twenty-three providers (87%) who participated in round one responded to round two of the Delphi Questionnaire process.

### **6.3.2 Characteristics of respondents**

#### ***6.3.2.1 Round one***

No significant difference was determined between round one survey responders ( $n$  23) and non-responders ( $n$  22) in the majority of characteristics, except there was a significant difference in cost of food provision ( $P=0.023$ ), with those responding having higher median food provision costs (€250), than those who did not respond (€135). No



significant difference was noted between the proportion of ‘manager trained’; ‘manager and staff trained’ intervention group pre-schools or pre-schools that received ‘postal feedback only’, with eleven (48%) ‘manager trained’, 9 (39%) ‘manager and staff trained’, and 3 (13%) ‘postal feedback only’ pre-schools responding. Neither was there a difference in the proportion of private ( $n$  14; 61%) and community services ( $n$  9; 39%) that participated or in the size of pre-schools engaging in the process. Of those pre-schools that responded, seven (30%) had less than 30 children in their service, 7 (30%) had 37-60 children and 9 (39%) had over 61 children in their care.

While a significant difference in ‘overall’ Pre-school Health Promotion Activity Scored Evaluation Form score ( $P=0.010$ ) was noted, with those responding having a higher median ‘overall score’ (40.5) than the non-responders’ median ‘overall’ score (30.5); a significant difference in ‘section’ scores was noted only in the snack score ( $P = 0.012$ ) with those responding having a higher median snack ‘section’ score (13) than the non-responders (10).

#### **6.3.2.2 Round two**

No significant difference were found between round two survey responders ( $n$  20) and non-responders ( $n$  25) in the majority of their characteristics; however, a significant difference was observed in: total number of staff ( $P = 0.022$ ), responders’ number of staff (12) and non-responders number of staff (8); number of full day care children < 12 months ( $P = 0.033$ ), median number of children of responders (2) and non-responders (1); cost of food provision ( $P = 0.004$ ) responders (€250); non-responders (€132.50). No significant difference was noted between the proportion of ‘manager trained’; ‘manager and staff trained’ intervention group pre-schools or pre-schools that received ‘postal feedback only’, that responded to the Delphi process, with ten (50%) ‘manager

trained', 7 (35%) 'manager and staff trained' pre-schools, and 3 (15%) 'postal feedback only' responding to round 2. Neither was there a difference in the proportion of private ( $n$  12; 60%) and community services ( $n$  8; 40%) that participated or in the size of pre-schools engaging in the process. Of those pre-schools that responded, four (20%) had less than 36 children in their service, 7 (35%) had 37-60 children and nine (45%) had over 61 children in their care.

A significant difference was observed between the two groups in a number of the Pre-school Health Promotion Activity Scored Evaluation Form scores: the 'overall' score ( $P=0.04$ ), with those responding having a higher median 'overall' score (41) than the non-responders median 'overall' score (29); the meal 'section' score ( $P = 0.006$ ), with those responding having a higher median meal 'section' score (11) than the non-responders median 'section' score (7); and the snack 'section' score ( $P=0.034$ ) with those responding having a higher median snack 'section' score (12) than the non-responders median 'section' score (10).

### **6.3.3 Round one Delphi questionnaire responses**

In total, 105 ideas for incentives were generated from participants in round one. **Table 6.1a, Table 6.1b, Table 6.1c** and **Table 6.1d** outline the ideas generated from the pre-school providers through the first round of the Delphi technique. The round one results were used to design the round 2 questionnaire.

**Table 6.1a Ungrouped pre-school provider responses from round one Delphi questionnaire**

	<b>Ideas for incentive scheme – Delphi 1 responses – ungrouped</b>
1.	More recipes that are not time consuming
2.	Funding to help with the cost of food
3.	Further advertising / communication for parents and public to raise awareness of programme – not just the food part, but the ‘family style dining’ & outdoor activity. Many of our parents request that their child doesn’t play outdoors if their child has a cold! For example! So it would educate them a bit too!
4.	Extra funding
5.	Plaque for wall
6.	Certificate
7.	Recognition in a newsletter such as the ‘Triple P Parenting’ newsletter or the WCCC newsletter
8.	List of crèches that received high standards in the local newspaper
9.	The programme is a very positive programme and that in itself is very encouraging
10.	The manner in which the children have responded to the changes made to their diet has also been very encouraging
11.	The feel good factor that we as a group of childcare providers are meeting all dietary needs
12.	To be able to relay to parents the active role we play in conjunction with the HIP to provide the best we can for the children we look after
13.	Also that parents have the assurance that their children’s needs are being met at a high standard which by taking part in the project has helped us to do.
14.	Help and advice from dietitian
15.	Menu ideas
16.	Recipe books
17.	Information on healthy eating
18.	Feedback
19.	Assistance in planning a healthy menu
20.	Funding to implement a healthy menu
21.	Talks for children, parents etc. on healthy eating: demonstrations
22.	Training for staff
23.	Resources for parents e.g. leaflets, brochures etc.
24.	Educate parents when preparing packed lunches
25.	Menu planning training for the chef and staff

DVD, Digital Video Display; HB, Health Board; HIP, Healthy Incentive for Pre-schools?; HSE, Health Service Executive; WCCC, Westmeath Community Childcare Committee; etc., etcetera; e.g. for example; &, and; /, or; i.e. such as; cert., certificate; 3D, three dimensional.

**Table 6.1b Ungrouped pre-school provider responses from round one Delphi questionnaire (continued)**

	Ideas for incentive scheme – Delphi 1 responses – ungrouped (continued)
26.	More publicity / advertisements to make everyone aware of the HIP project
27.	Sample foods for children to bring home like the food dude project that was run in the primary schools
28.	Award certificate for facility
29.	Award certificate for children’s participation
30.	Award certificate for staff
31.	Helpful in encouraging staff and children about healthy eating habits
32.	We are aware of the high incidence of childhood obesity and HIP encouraged us to promote healthy eating
33.	Supported us in giving children independence in feeding themselves / serving themselves
34.	Funding towards helping parents to learn about health nutritious filling meals
35.	Helping to educate children about healthy eating and nutrition
36.	Having a delegated support person to ask advice
37.	Having a person who could come into your service and demonstrate portions sizes, the correct dairy / protein etc. in each serving
38.	Information session for all staff
39.	Contact details of other services taking part in the scheme to share experience & advice
40.	Follow up on feedback received
41.	Outline details on your feedback form that states the exact changes you need to make to achieve the next level e.g. from silver to gold
42.	More courses on menu planning and nutritional side of meals
43.	Maybe a demonstration on preparing food
44.	We found if all good and menus we got were fine but children did not like them so found it hard to bring it each day when found not being ate
45.	A lot more expensive- maybe budget meals
46.	A set of simple guidelines in relation to dietary best practice for pre-schools
47.	A set of recipes / food suggestions which we could use on a daily basis
48.	A facility where we could call a dietitian with queries should we have them
49.	Occasional information evening / demonstrations for staff / parents in relation to healthy eating
50.	Provide workshops to help staff initiate the programme
51.	Sharing of information from other crèches on menus i.e. snacks & teas and other relevant ideas
52.	Receive a cert. which can be displayed on our notice board to let people know we are taking part
53.	A realistic points system which will help parents recognise the efforts each facility is making in relation to providing nutritious meals & snacks

DVD, Digital Video Display; HB, Health Board; HIP, Healthy Incentive for Pre-schools?; HSE, Health Service Executive; WCCC, Westmeath Community Childcare Committee; etc., etcetera; e.g. for example; &, and; /, or; i.e. such as; cert., certificate; 3D, three dimensional.

**Table 6.1c Ungrouped pre-school provider responses from round one Delphi questionnaire (continued)**

<b>Ideas for incentive scheme – Delphi 1 responses – ungrouped (continued)</b>	
54.	An information pack to help providers understand the level of standard expected of them
55.	Children’s books on healthy eating
56.	Award recognition
57.	Templates & direction for lesson planning
58.	Toy (related to healthy eating – play food, puzzles, games – similar to Búntus, Simon & Friends)
59.	Vouchers for fruit & vegetable shops
60.	Food dudes programme – something similar
61.	DVD / videos (healthy food)
62.	Posters
63.	3D model – digestive system
64.	Smoothie maker
65.	I think posters to display in the halls depicting healthy eating
66.	DVDs for staff to show to children
67.	Maybe a national healthy eating day where the kids taste different foods
68.	More colourful books & colouring books for kids
69.	Food games that can be played with the children during breaks
70.	Placemats for tables
71.	Recognition for taking part; i.e. something that can be placed on the door to let everyone know that service have put in the work
72.	Grants
73.	Quality mark to distinguish your service above others that aren’t involved
74.	Link with local enterprise to provide some sort of incentive, i.e. locally produced yoghurts to services etc.
75.	The award we received maybe could come in the form of a culture piece
76.	Advertisement in the local media which in turn could bring in new customers
77.	Support for centres that find it difficult to work with outside HB personnel
78.	Menu support and booklets were excellent (maybe a bounty of sample packages)
79.	Workshops for centres on food planning
80.	More feedback on the day that the inspection comes and a chance to feedback on and issues
81.	Stickers for children

DVD, Digital Video Display; HB, Health Board; HIP, Healthy Incentive for Pre-schools?; HSE, Health Service Executive; WCCC, Westmeath Community Childcare Committee; etc., etcetera; e.g. for example; &, and; /, or; i.e. such as; cert., certificate; 3D, three dimensional.

**Table 6.1d Ungrouped pre-school provider responses from round one Delphi questionnaire (continued)**

<b>Ideas for incentive scheme – Delphi 1 responses – ungrouped (continued)</b>	
82.	I enjoyed taking part and the fact that our centre has previously worked for and achieved an All Ireland Centre of Excellence helped. The changes in Regulation 5 will combine well with the work we have done on the HIP project. Thank you. Sorry for the delay. I feel this project has been of benefit to our centre
83.	Practical tips for childcare workers on issues such as fussy eating; do you give something else if something isn't eaten
84.	Regular short and snappy information that providers will be able to read quickly i.e. newsletter on regular basis
85.	Publicity from HSE for pre-schools participating in the project
86.	Relevant training sessions for staff and parents on a continual basis
87.	Mentoring hours as a support to make continuous improvements
88.	Handouts for parents on what is involved in the HIP project and the importance of these issues for their children (in different languages) e.g. Polish, Russian, Chinese
89.	Give the children a greater say in menu choice
90.	Make menu charts more visibly appealing to the children, e.g. use of bright colour in menu charts and pictures
91.	Involve the children in preparation of food
92.	Note – we promote a healthy eating policy but at the end of the day it's up to the parents.
93.	I think maybe to have a stand set up in hallway and meet the parents as they return to pick up their children; maybe when the parent gets talking to the nutritionist they would understand what to give their children to eat / drink
94.	Some children would still arrive in with chocolate chip bread or those yoghurts with the chocolate balls in the corner! We send them home and try not to let the rest of the children see that these food comes in
95.	Thank you Charlotte for all your help and it is going well so far
96.	Information evenings for parents so that they can hear from professional the points
97.	Grants for healthy drinks of milk etc.
98.	More literature for walls and rooms
99.	Recognition from HSE of involvement of crèches
100.	Awards for healthy eating policies
101.	We found the initial training very helpful in particular discussing the components that make a meal as opposed to a snack
102.	A meal chart that shows exactly what is required for each meal i.e. spaghetti: protein (beef), carbohydrate (pasta), vegetables (tomatoes), etc may be helpful
103.	Simple suggestions for meals that are both balanced and appealing to children would be helpful
104.	Healthy eating posters, DVD's, songs to encourage children to participate
105.	Information sessions for children by an expert e.g. dietitian or nutritionist

DVD, Digital Video Display; HB, Health Board; HIP, Healthy Incentive for Pre-schools'; HSE, Health Service Executive; WCCC, Westmeath Community Childcare Committee; etc., etcetera; e.g. for example; &, and; /, or; i.e. such as; cert., certificate; 3D, three dimensional.

#### **6.3.4 Round two Delphi questionnaire responses**

In round 2, providers ranked the incentive ideas on a Likert Scale with 16 incentive ideas being ranked as ‘very helpful’ with at least 70% consensus. **Table 6.2** outlines the incentive ideas from round two on which more than 70% of providers had reached consensus. None of the incentive ideas received a consensus level of 100%. **Table 6.3** outlines the responses ranked by their mean, indicating the level of importance attached to each response priority; the two most frequently chosen incentives were ‘grants for healthy drinks’ and ‘recognition for participation in the Healthy Incentive for Pre-schools project’. **Table 6.4a** and **Table 6.4b** outline the ideas generated from round two of the Delphi process for which consensus was not reached; these responses are ranked by the mean score attributed to them.

**Table 6.2 Delphi round two: ‘Very helpful’ incentive ideas on which consensus (70%) were reached by pre-school providers**

	Consensus level ‘very helpful’	<i>n</i>	Mean Score Response	Standard deviation
Grants for healthy drinks, i.e. milk	85	17	4.85	0.37
HIP project recognition, something such as a plaque	85	17	4.85	0.37
HIP project certificate for service	80	16	4.8	0.41
Extra funding / grants to promote healthy eating and physical activity	80	16	4.8	0.41
Vouchers for fruit and vegetable shops	80	16	4.8	0.41
Equipment that promotes healthy nutrition and physical activity e.g. smoothie maker; play equipment	80	16	4.8	0.41
Recipes	75	15	4.75	0.44
Healthy eating / physical activity resources for parents	83.3	10	4.75	0.62
Funding to help with the cost of food for an healthy menu	70	14	4.7	0.47
DVDs, videos, posters, songs on healthy food for children	70	14	4.7	0.47
HIP project certificates for children	75	15	4.7	0.57
Menus	70	14	4.65	0.59
More healthy eating / physical activity literature for walls	70	14	4.65	0.59
National Healthy Eating Day for children to taste new foods	70	14	4.65	0.59
Colourful and child friendly menu charts for children	75	15	4.65	0.67
Quality mark to distinguish service from other services that aren’t involved in the HIP project	70	14	4.65	0.59

i.e., such as; HIP, Healthy Incentive for Pre-schools’; e.g., for example; DVDs, Digital Video Displays; /, or; n, number of pre-schools; IQR, Interquartile range.



**Table 6.3 Items that gained consensus in round two of the Delphi process; ranked by mean**

<b>Incentive priority</b>	<b>Mean</b>	<b>Consensus Level</b>	<b>Rank</b>
Grants for healthy drinks, i.e. milk	4.85	85%	1 (joint)
HIP project recognition for service i.e. something such as plaque for the wall to let everyone know the work that has been done	4.85	85%	1 (joint)
HIP project certificate for service	4.8	80%	2 (joint)
Extra funding / grants to promote healthy eating and physical activity	4.8	80%	2 (joint)
Vouchers for fruit and vegetable shops	4.8	80%	2 (joint)
Equipment that promotes healthy nutrition and physical activity, i.e. smoothie maker; play equipment	4.8	80%	2 (joint)
Healthy eating / physical activity resources for parents. Healthy eating / physical activity resources for parents, e.g. leaflets, brochures	4.75	83.3%	3 (joint)
Recipes	4.75	75%	3 (joint)
Funding to help with the cost of food for a healthy menu	4.7	70%	4 (joint)
DVDs / videos / posters / songs on healthy food for children	4.7	70%	4 (joint)
HIP project certificates for children	4.7	75%	4 (joint)
Colourful and child friendly menu charts for children	4.65	75%	5 (joint)
Menus	4.65	70%	5 (joint)
More healthy eating / physical activity literature for walls and rooms	4.65	70%	5 (joint)
National healthy eating day for pre-school children to taste different foods	4.65	70%	5 (joint)
Quality mark to distinguish service from other services that aren't involved in the HIP project	4.65	70%	5 (joint)

i.e., such as; HIP, Healthy Incentive for Pre-schools'; e.g., for example; DVDs, Digital Video Displays; /, or; n, number of pre-schools; IQR, Interquartile range

**Table 6.4a Delphi round two: responses on which consensus was not reached (ranked by mean)**

Incentive priority:	Mean	Consensus Level
Children's books and colouring books on healthy eating	4.65	65%
Toys related to healthy eating: play food, puzzles and games	4.6	65%
Education for parents in how to make healthy lunchboxes	4.58	68.4%
HIP project certificate for service, staff and children	4.55	65%
Set of simple guidelines regarding dietary best practice	4.55	65%
HIP project recognition in newsletters such as the County Childcare Committee or 'Triple P' parenting newsletter	4.55	65%
HIP project stickers for children	4.5	60%
A once off workshop for staff (and chef) on menu planning	4.5	60%
Help and advice from dietitian in the HIP project	4.5	60%
An information pack to help providers understand level of standard expected of them in the HIP project	4.5	60%
To have dedicated outside support person to ask advice / answer queries, e.g. HIP Support Worker	4.5	55%
Funding towards helping parents learn about making healthy meals, i.e. nutrition and cookery course for parents	4.5	55%
Link with local enterprise for incentive provision, i.e. locally produced yoghurts at subsidised price	4.5	55%
Meal chart that would show exactly what is required for each meal in terms of food groups	4.45	55%
Publicity from HSE HIP project for pre-schools participating in project	4.45	55%
Advertising and communication tools for parents to raise HIP project profile with parents, e.g. HIP project newsletter	4.45	55%
Sample foods and rewards to bring home similar to Food Dude Scheme	4.4	55%
Practical tips for staff on feeding issues such as fussy eating	4.4	45%
HIP project 'parent information stand' for hallway to promote the project and nutrition & physical activity	4.35	55%
Templates & directions for healthy eating lesson planning	4.35	45%
Specific steps on feedback form to encourage achievement of the next award level of the HIP project.	4.35	45%
Handouts on HIP project for parents in different languages, i.e. Polish, Russian and Chinese	4.32	47.4%
HIP project placemats for tables	4.3	60%
Talk / demonstrations for children on healthy eating / physical activity	4.3	50%
A once off demonstration of portions sizes, food groups	4.3	45%
Short snappy regular health related information from the HIP project, i.e. regular newsletter	4.3	40%

DVD, Digital Video Display; HB, Health Board; HIP, Healthy Incentive for Pre-schools'; HSE, Health Service Executive; WCCC, Westmeath Community Childcare Committee; etc., etcetera; e.g. for example; &, and; /, or; i.e., such as; cert., certificate; 3D, three dimensional.

**Table 6.4b Delphi round two: responses on which consensus was not reached (ranked by mean) (continued)**

Incentive priority (continued):	Mean	Consensus Level
HIP project recognition for participating services in local media	4.26	52.6%
Feedback on progress in the HIP project	4.25	50%
Sharing experiences / information between crèches on menus i.e. snacks & teas	4.25	45%
HIP project Awards for healthy eating policies	4.25	45%
An ongoing series of workshops for staff (and chef) on menu planning	4.2	40%
Mentoring hours as a support provided by in-house HIP project Team leader within the pre-school service	4.2	40%
Health education resources i.e. 3D model of the digestive system	4.16	57.9%
Workshops for staff to help initiate the HIP project	4.15	45%
HIP project talks / demonstrations / information sessions for parents provided by HIP project Support Worker	4.15	40%
Healthy eating talks / demonstrations / information sessions for parents provided by HIP project Support Worker / Dietitian	4.11	55.6%
Ideas for budget meals	4.1	40%
To have dedicated HIP Project Team Leader within the pre-school service to answer any queries and to lead the project in-house	4.1	40%
Once off HIP project training / information sessions for staff	4.1	35%
More HIP project books	4.1	35%
Networking of contact details of other services to share experience & advice in relation to the HIP project	4.05	35%
Mentoring hours as a support provided by HIP project Support Worker	4.05	30%
An ongoing series of demonstrations of portion sizes, food groups	4.0	62.5%
Award provided would be a 'culture' type piece, e.g. statue or design piece	4.0	35%
HIP project certificates for staff	4.0	31.6%
A once off demonstration on preparing foods	3.95	35%
HIP project training sessions on continuous basis for staff	3.9	30%
An ongoing series of demonstrations on preparing foods	3.68	31.6%

DVD, Digital Video Display; HB, Health Board; HIP, Healthy Incentive for Pre-schools'; HSE, Health Service Executive; WCCC, Westmeath Community Childcare Committee; etc., etcetera; e.g. for example; &, and; /, or; i.e., such as; cert., certificate; 3D, three dimensional.

## 6.4 Discussion

The Delphi Questionnaire technique was used in this study to collect ideas from pre-school providers on their favoured incentive for inclusion in the project. Facilitation of a consultation with stakeholders is an extremely important (Sidell, 1999) process in enabling ownership (Jones *et al.*, 2000). The Delphi process involves three key stages: ‘discovery of opinions; the process of determining the most important issues; and managing opinions’ (Hasson *et al.*, 2000). Though ‘consensus’ is the term used for ‘the achievement of concurrence in a given area where none previously existed’ (McKenna, 1994), it is suggested that reaching consensus does not necessarily mean that the right answer has been determined as there may be a possibility that too much emphasis is placed on the results obtained (Keeney *et al.*, 2001) rather than viewing them in association with a complete review of the research literature. With this in mind, it is important to use the results obtained in this study in the context of other published research on pre-school providers’ opinions on suitable incentives for participation in health promotion interventions.

The top five incentives, on which greater than 70% of providers reached consensus, were: grants for healthy drinks, i.e. milk; Healthy Incentive for Pre-schools project recognition, for achievement of goals specified in the project, such as a plaque; Healthy Incentive for Pre-schools project certificate for project participation; extra funding / grants to promote healthy eating and physical activity; vouchers for fruit and vegetable shops. It would appear from these results that both financial assistance and recognition of health promotion efforts are perceived by providers as the most helpful to them.

The voicing of a desire for financial assistance is in keeping with the issue raised by providers in the Healthy Incentive for Pre-school project who outlined that the cost of food was a barrier to healthy food provision in the pre-school setting. Food provision costs have been shown to impact on the type of food served in several international studies. Pre-school providers in one qualitative study in the United Kingdom suggested that budgets affect the quality of the food that is provided to children in their care (Moore *et al.*, 2005) while another study demonstrated that the budget for food provision in a child care establishment was more likely to be restricted, with more processed food in evidence, if owned by one person and run to make a profit (Lloyd-Williams *et al.*, 2011). In addition, pre-schools in the United States which received higher grant levels were found to spend more money on their menus than those receiving less grant aiding; this was reflected in significantly higher nutrient density in the food provided (Monsivais *et al.*, 2011). Provision of subsidies has also been linked with the promotion of quality in the childcare setting (Organisation for Economic Co-operation and Development, 2006), and is, therefore, a tool worth consideration as it may help to motivate such change in this setting in Ireland.

A request for recognition for work carried out in association with the project may reflect the important need for society to recognise workers in this setting for the valuable contribution that they can make to a child's development. With providers expressing the view that some parents worry more about the cost of their child's care than the type of food provided (Moore *et al.*, 2005), and a call for improvement in quality of childcare provision through the promotion of recognition and respect, training, wages and policies to support workers in this setting (Shapiro Kendrick, 1994; Early & Winton, 2001; Benjamin *et al.*, 2009b), the identification of recognition as a 'very helpful' potential aspect of the Healthy Incentive for Pre-schools project is both

relevant and pertinent. Improved recognition may aid the development of pre-school staff confidence which may, in turn, improve providers' ability to work with parents to ensure best practice is attained, and prevention of disharmony between practice in the childcare setting and the home environment (Moore *et al.*, 2005; Taveras *et al.*, 2006; Jennings *et al.*, 2011).

While one of the key advantages of the Delphi survey is that it aims to '*guide group opinion towards a final decision*' (McKenna, 1994), some criticise the technique as it is perceived to '*force consensus*' and does not facilitate discussion of the issues raised by participants (Hasson *et al.*, 2000). However, others believe that the process allows all respondents to view the collective group opinion and that there is opportunity for participants to modify their original opinion if they so wish (Goodman, 1987), with less scope for participants to be swayed by a dominant voice (Keeney *et al.*, 2001) as might be the case in a face-to-face situation such as a focus group. Considering this, a limitation to this study may be that although consensus was reached, and the results were considered in light of the literature, there was no opportunity to then use the results to structure discussion and debate as is recommended by some (Hasson *et al.*, 2000).

Although a further limitation to this study may have been the relatively poor response observed in round one (51%) it is important to consider that low initial response rates are typical of studies that employ questionnaires (Keeney *et al.*, 2006; Hsu & Sandford, 2007) and that due to the difficulties inherent to the Delphi technique: small initial pool of experts, iterative nature of process; and inability to use multiple follow-up contacts, the likelihood of a poor response rate in round one is higher (Hsu & Sandford, 2007) than in other traditional methods. In fact, it is interesting to note that, in a recent systematic review of the Delphi method, response rates for all rounds were

only reported in 39% (31 of 80) of the studies considered (Boulkedid *et al.*, 2012), perhaps suggesting that low response rates in round one may be common, but may not be reported in the literature. Indeed, while the median response rate of these 31 studies was reported by Boulkedid and colleagues (2012) to be 90%, one must take into consideration when interpreting this figure that over half of the studies reviewed did not report a response rate. In addition, a study to identify research priorities of cancer nursing specialists reported a round one response rate of 54% (60 of 112) (McIlpatrick & Keeney, 2003), but provided few demographic details to enable comparison of responders and non-responders; while another study of registered dietitians outlined a 72.6% (85 of 117) response rate, but noted no significant difference in study characteristics between study responders and non-responders (Brody *et al.*, 2012). Interestingly, another Delphi study in Sweden yielded a response rate of 83% (25 of 30) in round one; the group was described as ‘strategically selected nurse scientists’ and no characteristic data were available on responders versus non-responders (Löfmark & Thorell-Ekstrand, 2004).

In this study, while the process for the Delphi technique had been explained to each pre-school provider, at both the pre- and post-intervention Healthy Incentive for Pre-schools project visits, and written information had been provided regarding the process, this may have been insufficient to encourage participation. McKenna (1994), in discussing the problem of poor response rates, suggested that face to face interviews in the first round of the survey would significantly increase response rates, hypothesising that as the participant would know the researcher they would be more likely to respond. However, as the pre-school providers in this study already knew the researcher, this particular factor may not have been relevant. It is possible, however, that an additional face to face meeting in the child care setting, solely dedicated to the

Delphi process, may have prompted a higher response, with child care staff dedicating time to a face-to-face interview, something that might not happen with a postal questionnaire in a busy childcare setting. Although the time and financial costs of face to face interviews during round one of this study were prohibitive, future use of round one face-to-face interviews would be worth exploring as would the possible use of pre-round one telephone contact, as recommended by Hsu & Sandford (2007); this being perhaps a more cost effective method to improved round one response rates. It is also worth considering that the low initial response rate, may have been due to pre-school providers reaction to their overall Pre-school Health Promotion Activity Scored Evaluation Form scores, with those responding having a significantly higher Pre-school Health Promotion Activity Scored Evaluation Form 'overall score' than those who did not respond; this would also then explain the much higher response rate of 87% seen in round two, a rate similar to that seen in the final rounds of other Delphi studies (Boulkedid *et al.*, 2012).

## **6.5 Conclusion**

While there would appear to be a number of advantages and limitations to using the Delphi technique, this study used this methodology to facilitate the collection and convergence of opinion from pre-school providers on the incentives that they would find 'very helpful' for inclusion in the Healthy Incentive for Pre-schools project, and which would encourage and motivate them to continue to participate in such a scheme. Financial support for the implementation of healthy initiatives and recognition for best practice were the most favoured incentives recorded in this study; both of these incentive ideas would support pre-school providers in their work and would address the



issues of prohibitive cost and low staff confidence highlighted in the published literature.

## CHAPTER 7

### DISCUSSION, CONCLUSIONS & RECOMMENDATIONS

#### 7.1 Introduction

This chapter outlines a discussion of the Healthy Incentive for Pre-schools project, provides an overview of the research conclusions and presents recommendations for the future with regard to nutrition and health related practice in pre-schools providing full day care services in Ireland.

#### 7.2 Discussion

It is recommended that interventions should be tailored to a target group (Summerbell, 2007), and should concentrate on equipping children to take care of themselves through healthy actions and behaviours (Hayman *et al.*, 2004). The pre-school setting has the potential to play a vital role in obesity prevention (Ward *et al.*, 2008b) through the targeting of quality practices (American Dietetic Association, 2005; American Dietetic Association, 2011). However, few health promotion interventions have focused on pre-schools despite calls to fund research (Larson *et al.*, 2011) and to implement health promoting initiatives in this area (Flynn *et al.*, 2006; Story *et al.*, 2008; Lanigan *et al.*, 2010).

The Healthy Incentive for Pre-schools project is the first intervention in the Irish pre-school full day care service setting which aimed to evaluate the impact on nutrition and health related practice of two methods of delivery of a nutrition and health intervention: training of pre-school managers only or training of managers and their staff. A simple randomised study with pre-schools divided into two training groups: 'manager trained'; and 'manager and staff trained' was undertaken. Direct observational data was collected using a specifically developed and validated Pre-school Health Promotion Activity Scored Evaluation Form. Food and fluid provision; physical activity; outdoor time; staff practices, and availability of nutrition and health resources were recorded during one full day spent in each pre-school both pre- and post-intervention. After the intervention, self-assessment data were also collected using the same evaluation tool. Pre-school managers were questioned using the Delphi Technique regarding their preferred incentives. From the pre- to post-intervention phases significant improvement ( $P < 0.05$ ) in nutrition and health related practice was observed within both intervention delivery groups in all areas evaluated: environment, food service, meals and snacks. No additional effect was observed that was attributable to staff training. The Pre-school Health Promotion Activity Scored Evaluation Form scores assigned by direct independent observation were lower than pre-school self-assessment scores. Use of the Delphi Technique established that grant aiding and recognition were the incentives most favoured by pre-school managers.

### **7.2.1 Key nutrition and health related practices and their impact**

Considering the adverse economic environment in Ireland which manifested in 2008, and the considerable ensuing pressure under which the childcare setting was placed, the pre-schools that participated in this study must be applauded for their hard work and

enthusiasm in prioritising the need for best practice enough to undertake a new and challenging project voluntarily. The ability of the pre-schools in this study to introduce many changes to practice demonstrates an openness and willingness to learn and to facilitate quality procedures, when there is an understanding of the need for such change. Pre-schools were encouraged to make many changes to their environment, food service, and to the food and fluids they provided. Through their diligence practices were significantly improved, which in turn may have a beneficial effect on children's learning and health outcomes. A number of these key practice aspects, and their importance in relation to child health and development, will now be outlined.

#### ***7.2.1.1 Pre-school environment and food service***

While pre-schools were shown to increase their development of policy, the creation of this using the 'whole pre-school' approach (Southern Health Board (Ireland), 1999; Department of Health and Children (Ireland), 2004; School Food Trust, 2012) was more limited. Considering the important role that policy plays in ensuring clarity with regard to a pre-school's nutrition and health regimens and food provision, and the positive impact it can have on ensuring best practice, there is a need to promote this policy development approach more earnestly in Irish pre-schools.

Pre-schools should include information in their policies on the use of food as rewards (Turner *et al.*, 2012) and how they intend to integrate food learning into their curriculum. Considering the rise in childhood obesity in recent years (Sherry *et al.*, 2004; Ogden *et al.*, 2006), and the reporting of high levels of sedentary behaviour within pre-schools (Christakis & Garrison, 2009; McWilliams *et al.*, 2009), ensuring adequate physical activity (Sallis *et al.*, 2000; Burdette *et al.*, 2004) outdoor time, and outdoor clothing, through policy implementation is essential, particularly when one

considers the poor participation levels of Irish primary school children in comparison to their European counterparts (Hardman, 2008).

Considering that many associations with food are linked with experiences generated in childhood (Singer *et al.*, 1995; Batsell *et al.*, 2002; teVelde *et al.*, 2007), the lack of ‘family style food service’, self service, staff sitting and eating with children, or appropriate utensil provision observed pre-intervention in this study was somewhat disconcerting. Importantly pre-schools significantly improved these practices post-intervention and this is hugely to be welcomed. However; not all pre-schools achieved ‘best practice’ standards. Therefore these practices should be targeted further by all who support pre-schools, such as pre-school inspection teams, health promotion staff and community dietitians. A concentration on food safety in the national inspection process, while very important, perhaps prevents pre-schools from realising and focusing on the importance of food service practices that are so essential to the pre-school child’s food learning. There is a need for national focus on these aspects of pre-school service and for value to be placed on their implementation. Training at a national level with regard to such practice is warranted; during staff pre-service education courses, and within the training provided to pre-schools by health service and early education staff.

#### ***7.2.1.2 Food and fluid in the pre-school setting***

Health professionals have been encouraged to work with parents, guardians and child-care workers to both prevent and treat obesity in young children (American Dietetic Association, 2011). Supporting pre-schools to provide appropriate healthy food may help to prevent childhood obesity (Fox, 2010) and may have far reaching effects on the prevention of diseases, such as diabetes or cardiovascular disease into the future (Koletzko *et al.*, 2011). Although a number of studies have questioned providers about

the food they give to children (Jennings *et al.*, 2011; Lloyd-Williams *et al.*, 2011), relatively few have directly observed food served to, or eaten by, children in full time care (Ward *et al.*, 2008b). This study now adds to the data available on food provision in this setting, and is extremely valuable as the data was collected by direct observation rather than by self-reported means.

The finding that both training groups significantly improved their overall ‘meal’ and ‘snack’ provision practices post-intervention is an extremely important one. With the pre-school responsible for providing sufficient, regular food amounts for children in a full day care service (American Academy of Pediatrics & American Public Health Association, 2002; Department of Health and Children (Ireland), 2004; School Food Trust, 2012), it is somewhat concerning, however, that the majority of pre-schools did not attain a ‘best practice’ standard. Although this is but one aspect of practice there is a need for this finding to be further investigated. Provision of clear guidance on the Food Groups that constitute meals and snacks (Benjamin, 2007; School Food Trust, 2012) simplify their planning and provision. Inclusion of such direction in the Irish Food and Nutrition Guidelines for Pre-schools (Department of Health and Children (Ireland), 2004) and pre-school regulations (Department of Health and Children (Ireland), 2006) would be useful.

The inadequate provision of two nutrients, calcium and iron, in this study was also of particular note. Considering these findings, all childcare services should be encouraged to provide sufficient iron rich (Cowin *et al.*, 2001; Hallberg *et al.*, 2003) and calcium dense foods (Miller *et al.*, 2001) for children in their care. A national co-ordinated approach could be taken to this issue. In the United States, grant aiding has been linked with the provision of more nutritious food in this setting (Monsivais *et al.*, 2011). With use of the Delphi Technique in this study determining that healthy food

provision grants were a favoured incentive for pre-schools, the delivery of grants, for the provision of iron or calcium containing foods, to pre-schools who are successfully participating in a project such as the Healthy Incentive for Pre-schools project should be explored. At the very least an assessment of the School Milk Scheme and its role in the pre-school setting is warranted considering the findings of this research, that suggest that pre-schools are not partaking in the scheme as it is not cost-effective or user friendly.

While results from this study suggest that many parents provide food and fluids for their children whilst they are in pre-school, many managers reported feeling unable to 'challenge' a parent's food provision or nutrition requests, even if these were contrary to best practice. Health professionals must encourage pre-school providers and parents to provide adequate food choices to meet the nutrition needs of children (American Academy of Pediatrics & American Public Health Association, 2002; Sweitzer *et al.*, 2009). It is the provider's responsibility to supply written guidelines for parents regarding the food that they need to supply. If this food is insufficient the onus is on the provider to supplement this food (American Academy of Pediatrics & American Public Health Association, 2002).

The finding, pre-intervention, that children did not get the opportunity to serve themselves water throughout the day, was worrying and is contrary to that which is recommended (American Academy of Pediatrics & American Public Health Association, 2002). There is a need to encourage children to develop healthy drinking habits in childhood (Benelam & Wyness, 2010). Interventions, such as the Healthy Incentive for Pre-schools project, that target childcare settings to provide adequate fluids and appropriate drink choices for this age group must be promoted.

## **7.2.2 The role and perceptions of pre-school managers**

### ***7.2.2.1 Leadership and change management***

The need to encourage and support providers to follow best practice and to be in control of the food provided in their pre-school is necessary and is recommended (American Academy of Pediatrics & American Public Health Association, 2002; Department of Health and Children (Ireland), 2004). Managers noted that staff can have a very positive or very negative impact on: healthy habit formation; eating; food experience; and outdoor time, and that the staff in a pre-school need to be completely ‘on board’ with the Healthy Incentive for Pre-schools project initiative for it to work, a phenomenon which has been described elsewhere (Owens, 2007; Tansey, 2010). Interestingly, a number of managers also felt that their long term experience counted for much more than research and best practice, making it harder for them to understand the need to change everyday routine.

The manner in which child care workers respond to change can vary greatly; some may view it as a positive opportunity to improve service and progress, motivating workers to *‘engage in their work enthusiastically and with renewed purpose, providing opportunities to take a fresh approach and for teams to build and strengthen’*; while others may be resistant to change, may feel threatened, stressed or anxious with *‘a negative effect on child care professionals by lowering self esteem and undermining their confidence to carry out tasks’* noted in some cases (Tansey, 2010). It has also been suggested that if change is not managed effectively it can lead child care workers to *‘experience difficulty in coping, resulting in low morale and poor outcomes for children’* with workers feeling *‘uncomfortable’*, *‘threatened’*, *‘complacent’* or *‘disinterested’* which may lead to increased stress and conflict within a team (Tansey, 2010). Child care workers may feel anger if they feel that change is being imposed



upon them and that they have no input into the planned changes, feeling their views have been ignored by management (Owens, 2007). Considering the beliefs and attitudes of managers regarding staff practice it may be necessary to advocate practical ways to manage change within the childcare setting. Education of pre-school managers regarding the four factors identified as key to encouraging change within an organisation would be beneficial in assisting managers to implement health promotion activities in the pre-school setting (Pobal Early Childcare Unit (Ireland), 2011). The key factors advocated are: '*pressure for change*', that management have identified the need to change, have signed up for change and will be a driving force for that change; '*a clear shared vision*', a need to understand what motivates staff (pride, happiness, responsibility, recognition, security, success, money) and provide that motivation; '*capacity for change*', provision of resources such as time and finances and action, '*implementation of the planned change*', keeping up momentum, monitoring and analysis of progress and keeping employees aware of progress (Pobal Early Childcare Unit (Ireland), 2011).

The introduction of the concept of self-service and 'family style food service' to Irish pre-schools was new to many of those who participated in this project. Although recognised as best practice across the world (American Academy of Pediatrics & American Public Health Association, 2002; American Dietetic Association, 2011), the cultural context must be acknowledged in this regard, as for many in the Irish food landscape in general, these concepts of practice are novel. Some pre-school providers expressed fear in relation to giving children independence with food, which is similar to findings reported by Lohse *et al.*, (2012). There was also an apprehension expressed that children would eat too much food if they were allowed to participate in self service, a concern which is not backed up by the research available on this subject (Marchiori *et*

*al.*, 2012). While self service may be introduced from an early age (Satter, 2012), a number of services ‘felt’ they could not introduce it to the younger age groups.

The resistance to the implementation of these new ideas and practices may have been caused by the presence of less than adequate change management skills, namely: lack of consistent leadership; de-motivated staff; lack of capacity such as budget cuts or ‘*stressed out*’ staff; lack of initiative to ‘*do something different*’ (Pobal Early Childcare Unit (Ireland), 2011). In fact, contrary to the position of the aforementioned providers, others in the project expressed surprise at how well ‘family style food service’ worked when introduced and how self-service reduced wastage and pressure on the chef. These providers acknowledged that the introduction of these practices took time, but that the children enjoyed participating and that this then increased children’s confidence and independence. This attitude and practice may reflect a difference in the way in which change was approached in these particular settings; effective planning and change management being central to delivery of quality child care (Owens, 2007). As childcare managers and leaders play an important role in identifying the manner in which their staff react to change, it is necessary for managers to be sensitive to individual reactions when managing change (Tansey, 2010). Further exploration of the need to introduce change management education for pre-school managers in Ireland may be an important consideration for any future health promotion work within this setting.

### *7.2.2.2 Costings and budgets*

When questioned on issues that influenced practice, the pre-school managers noted that costs associated with food provision; parental influences; staff issues, and the economic downturn all had an impact on their service provision. The perceived cost of trying new foods, and a fear that children would not eat newly introduced food, which would in turn lead to increased wastage, were reported as real issues for providers in this study. Some providers also commented that they did not wish to have to pay for the extra cost of staff eating food with children. However it is worth noting that the effect of cost on food provision is not exclusive to this study and has been reported in other studies relating to pre-schools internationally (Moore *et al.*, 2005; Lloyd-Williams *et al.*, 2011; Monsivais *et al.*, 2011).

While little is reported in the literature regarding the effect of recession on food choices (Miller & Branscum, 2012), the economic downturn that has taken place in Ireland since 2008 was discussed by many managers in relation to other effects it has had on their practice. Although the characteristics of the pre-schools in the study project did not differ significantly pre- to post-intervention, despite the economic downturn, managers felt there had been an increase in children taking ‘part time’ full day care service places. This was reported to lead to greater difficulty in encouraging healthy habits, with parents not following through with the habits initiated in pre-school when the children were at home during the other part of the week. Managers also alluded to a ‘drop in child numbers’ which resulted in a loss of staff. This reportedly culminated in an inability to fully embrace the concepts of the Healthy Incentive for Pre-schools project, as some considered they needed a full staff quota to facilitate best practice. Added to this, the introduction of the Early Childhood Care and Education scheme was also cited as an issue of concern for some, as it was reported that the

scheme does not cover food provision costs. Many pre-schools report that because of this cost constraint they ask parents to supply their children's food, however, they then feel unable to control the type and amount of foods, with many worrying that parents send inappropriate food and fluid. This highlights the need to encourage providers in this situation to feel confident to approach parents using their health policy to reinforce their stance on the need for healthy food and fluid provision regardless of the source (American Academy of Pediatrics & American Public Health Association, 2002).

### ***7.2.2.3 Motivation and support***

Support of workers in the childcare setting is predictive of quality (Mooney, 2007), and the level of communication and personal contact provided to pre-school managers in this project was also found to be very important, with telephone follow-up and verbal discussion deemed to be necessary; providers' noting apprehension when they received their Pre-school Health Promotion Activity Scored Evaluation Form score through the post, and feeling uncertain regarding their own score, until they were able to discuss it with the project team.

Using the Delphi technique enabled the collection of ideas from providers on the incentives they would most favour for inclusion in the project in the future. The investigation provided the opportunity for pre-school managers to become more involved in the project process through consultation (Sidell, 1999) and empowerment (Tones, 2001). It is important however, that following the engagement of pre-schools in this process, the ideas that were generated are considered and that a formalised recognition structure is included in the project in the future, so that the pre-schools involved will continue to perceive their role and input as important.

Parents appeared to be a source of concern for pre-school providers, with many voicing a frustration that parents are not backing up health promotion work carried out in the crèche when the children are at home; leading to managers and staff wondering why they should make the effort to follow best practice guidelines. Some providers appeared to be afraid that, as parents pay the bills and can ultimately decide where they will send their child, they, the childcare staff, cannot challenge parents on habits and attitudes, as to do so may result in parents removing their child and sending them to a service who will not question or encourage parents to follow best practice. This is a similar finding to Taveras *et al.*, (2006) who found that providers raised concerns about offending parents and cited this as a barrier to health promotion activity involvement. While significant differences in the expectations and needs of parents and staff exist (De Gioia, 2009), identification of these, and promotion of open dialogue and partnership between the two groups, is necessary to ensure best practice care for children. A number of recommendations have been made relating to the development of parent staff partnerships, these include: staff asking parents what their expectations are for their child in the childcare centres; identification of methods to connect with parents that are greater than the ‘drop-off and pick-up chat’; ensuring that parents and staff speak a common language and employment of resources such as translators if language is a difficulty; discussion of routine practice with parents and encouragement of parents to share ideas and practices with each other (De Gioia, 2009). While good communication can help to prevent conflict and can diffuse a scenario that might otherwise become a problem (Pobal Early Childcare Unit (Ireland), 2011), it must be acknowledged that although the creation of good relationships between parents and staff relies on clear, effective two way dialogue, this situation may be difficult to attain when child care workers are very busy with large numbers of children and families (McKay, 2008).

The provision of funding to pre-schools in Ireland regardless of their quality is an issue that needs to be addressed by policy makers. The intervention in this study encouraged quality improvement but required pre-schools to undertake a large number of changes to their practice, which they did voluntarily. Pre-schools which engage to improve their children's care should be acknowledged and encouraged to maintain the changes they make and strive towards a 'best practice' standard. At present there is no such nationally driven incentive. In fact there is a clear disincentive; with pre-schools who do not engage in service improvement interventions such as the Healthy Incentive for Pre-schools project, receiving state funding equal to those who do participate.

### **7.2.3 Study limitations**

There were a number of issues that could be viewed as potential limitations to this study, a summary of which will now be outlined.

#### ***7.2.3.1 Sample of pre-schools***

Although the sample size of pre-schools may be regarded as quite small, and this could be seen as a limitation, the population of pre-schools in the Midlands of Ireland is finite and a good representation of full day care pre-schools was obtained; community and privately owned and from the four midland counties. This was despite the economic recession which evolved during the project process and which caused closure and movement of pre-schools from full day care service provision to sessional care service delivery and which had not been anticipated during the project planning process.

Another potential limitation may be that pre-schools which enrolled in the study could have been either more motivated than their counterparts who did not participate,

or they may have felt they needed more assistance with the health and nutrition aspect of their service. To clarify this, further study to determine practice in those pre-schools that did not engage is warranted; however, there is a need to determine a method to connect with and motivate these services to partake in such a study, as despite using a number of methods in this project: written communication by letter; verbal communication by telephone; and in person pre-school visits, their engagement was not possible. It is interesting to note, however, that although a number of pre-schools visited prior to the intervention did not proceed to the post-intervention phase of the project, their characteristics and scoring were similar to those that did proceed, indicating perhaps less likelihood of bias of poorer practice amongst those who did not proceed.

The pre-schools that participated were based in one geographical region in the Midlands of Ireland, an area which is considered to be disadvantaged (Small Area Health Research Unit, 2006). While it is possible to suggest that the pre-intervention practices observed may be present in pre-schools in other areas of the country and, therefore, the beneficial learning from this study could be applied to other pre-schools offering a 'full day care service'; resulting in an improvement in the nutrition and health habits of a large number of children in full time care, it would be necessary to replicate the study process in a less disadvantaged area to determine whether the results obtained may have been affected by the study location.

Although the results of the pilot work for this project, that took place in Co. Wicklow, demonstrated similar poor practice in relation to food provision and health related practice (Johnston Molloy *et al.*, 2011) despite these pre-schools being situated in what would be considered a less disadvantaged area than the midland region (Small Area Health Research Unit, 2006), much evidence suggests that social disadvantage is

*'linked with poorer quality diets and negative health outcomes for young children'* (Swanson *et al.*, 2011).

In the United Kingdom, for example, an examination of the data collected from 10,139 three year old children involved in the Avon Longitudinal Study of Pregnancy and Childhood (ALSPAC) assessed frequency of consumption of a range of food items and determined that a diet which centred on convenience food provision was associated with younger, less educated mothers (North *et al.*, 2000). In Ireland, similar evidence exists with two studies of children demonstrating this link between social disadvantage and poor nutrient intake. A study of self reported data from the 2006 Health Behaviour in School Aged Children survey of children aged 9-18 years demonstrated that children from disadvantaged schools had poorer diets, less family meal occasions and watched more television during meal and snack times than those from less disadvantaged schools (Kelly *et al.*, 2008). A separate study examined the database of the 2003/2005 Irish National Children's Food Survey (*safefood*, 2008) of children aged 5-12 years. This study determined that those children of lower socio economic status consumed more butter and spreads, meat and meat products, potatoes and potato products; consumed less pasta and rice, fruit, fish and fish products, poultry and poultry dishes; and had lower intakes of copper, magnesium and zinc. Further it was demonstrated that children from non-professional families and those attending disadvantaged schools consumed less protein and fibre and more sugar; failing to meet the recommended guidelines for magnesium and riboflavin. Interestingly, when questioned, parents in this socio economic grouping expressed less interest in providing an healthy diet for their children and suggested that children's food preferences were a barrier to healthy eating (*safefood*, 2008); a finding mirrored by the pre-school managers' in this study when questioned regarding their perception of barriers to healthy food provision, and also by



parents of pre-school aged children in the National Pre-school Nutrition Survey (Irish Universities Nutrition Alliance, 2012). A key conclusion of the *safefood* study was that children were more vulnerable to socio economic status differences in food and nutrient intake, and that when food poverty is being considered, children should be viewed as a priority group, with emphasis being focused on encouraging food variety from early childhood and employing methods to aid families to cope with children's food preferences (*safefood*, 2008).

However, while data for older children is available in Ireland, information on the nutrient intake of socially disadvantaged pre-school aged children is less evident. The Irish Universities Nutrition Alliance National Pre-school Nutrition Survey collected data from a nationally representative sample of 500 children aged 12-59 months. The authors acknowledge that although generally representative of social class there were a higher proportion of children of professional workers in the survey and, as no significant difference in nutrient intake or body weight was determined between social classes, the data was not adjusted for this. Social disadvantage may also play a role in diet in this pre-school age group in Ireland. As the economic recession has negatively affected so many families' incomes in Ireland in the last number of years, with 9% (one in every eleven) aged 0-17 years in 2009 considered to live in 'consistent poverty' (End Child Poverty Coalition, 2011), a further exploration of this data (Irish Universities Nutrition Alliance, 2012) may be warranted. This may then help to inform future health prevention strategies for this age group; with encouragement of healthy eating in young children viewed as a 'crucial' government action to ameliorate population health (Swanson *et al.*, 2011).

### ***7.2.3.2 Data collection***

It could also be said that making an appointment to visit each pre-school at both data collection time points, essentially ‘prepared’ pre-schools to alter practice for the visit of the researcher and that this is a possible limitation, however, to counteract this possibility pre-schools were not advised of the specific components that would be observed on the visit day. The practice observed during the visits could be said to reflect actual routines and habits as, by the very nature of the pre-school and the children cared for therein, it would be difficult to alter an everyday childcare approach within a two week period, as practices undertaken with this age group require much repetition and time to change (Cooke, 2007; O’Connell *et al.*, 2012).

Collecting data on one day only could be also seen as a limitation, as one day’s observation may not fully reflect the practices of an individual pre-school on a weekly or monthly basis. However, given that holiday times and settling-in periods were omitted, and that different pre-schools were visited and assessed on different days of the week to determine an aggregate view of practice, there is confidence that the practices reported do reflect normal routines within the study pre-schools. To heighten reliability, all observations were also made by one Research Dietitian, ensuring consistency of assessment across the 42 pre-schools observed. Although this in itself may be considered a limitation, as it was not possible to determine inter-rater reliability; having even one extra ‘outside’ person in a pre-school setting may affect the inherent practice undertaken by staff; therefore, one researcher would cause minimal interruption compared to the effect of a team of researchers working in a single setting on a particular day. This study aimed to collect data, with minimal disruption to the staff or the children, an important consideration when planning any research activity in this

setting; using observation, which is considered the most effective data collection method (Gittelsohn *et al.*, 1994) helped to ensure quality data were obtained despite the aforementioned limitations.

### ***7.2.3.3 The intervention***

While traditionally, studies such as this one contain both an intervention and control group, a potential limitation of this study may have been that instead, this study involved two intervention levels. The decision was taken to use this study format for a number of reasons: to ensure maintenance of pre-school engagement in the project process; ‘true control’ group contamination prevention would have been unfeasible in this setting; and ethically, to ensure best child welfare, it was determined that all pre-schools in the study should receive an intervention.

## **7.3 Conclusions**

This intervention study is the first of its kind to take place in pre-schools setting, providing a full day care service, in Ireland. The development and validation of a Pre-school Health Promotion Activity Scored Evaluation Form and its use as a data collection tool, in tandem with the tailor made accompanying Pre-school Education Resource Pack, facilitated pre-schools to take cognisance of, and improve, their nutrition and health related practice; aiming towards the achievement of best practice standards.

The pre-intervention data collected using the Pre-school Health Promotion Activity Scored Evaluation Form showed: inadequate food and fluid provision; an

inappropriate food service environment to promote healthy habit formation; and an environment that was not conducive to nutrition education or participation in physical activity and outdoor time. Importantly, however, although sixteen of the fifty eight pre-intervention pre-schools visited did not proceed to the post-intervention phase of the project; their characteristics and scoring were not significantly different to those of the forty two pre-schools that progressed, indicating that there was less likelihood to be bias of poorer practice amongst those who did not proceed.

The pre-intervention findings in this study were of special interest when one considers previous research, which has demonstrated that adequate energy and nutrients are essential for normal growth and development in infancy and childhood (Food Safety Authority of Ireland, 1999b; Lozoff *et al.*, 2000; Department of Health and Children (Ireland), 2004; Crawley, 2006; Flynn *et al.*, 2006), and knowing that the food a child receives in their first two years influences the variety of food consumed in later life (Skinner *et al.*, 2002). As health habits that develop in childhood relating to nutrition (Singer *et al.*, 1995; teVelde *et al.*, 2007) and physical activity (Telama, 2009) appear to track into later life; it could be hypothesised that in general children who are in full day care services in Ireland may be at risk of deficiency of nutrients such as iron and calcium, due to inadequate food provision for health, and may not be gaining healthy associations with food or physical activity thus risking inappropriate habit development. Although international research is available that demonstrates inadequate food provision (Padget & Briley, 2005; Ball *et al.*, 2008; Erinoshho *et al.*, 2011) and food service (Nahikian-Nelms, 1997; Hendy, 2002) in the childcare setting, in Ireland little is known about the food provided to children in childcare other than that reported by pre-school managers themselves (Jennings *et al.*, 2011). While the findings of the National Pre-school Nutrition Survey (Irish Universities Nutrition Alliance, 2012) demonstrate poor

intakes of vitamin A, iron and the risk of vitamin D deficiency amongst pre-school age children, these data are for a general population, cared for both in the home and in out of home care and to date no data set are available from this survey specifically relating to the intakes of children in full time care in Ireland (Irish Universities Nutrition Alliance, 2012).

Although many experts have stated that childcare providers must provide suitable nutrition and an environment that fosters healthy habit formation (American Academy of Pediatrics & American Public Health Association, 2002; Bristow *et al.*, 2011), the findings of this research prior to intervention, would suggest that fears regarding the quality and quantity of food served in this setting in other jurisdictions (Briley & McAllaster, 2011), may be also well justified in Ireland. In this country, to date, the statutory regulations governing pre-school nutrition are unspecific in their detail (Department of Health and Children (Ireland), 2006). The American Dietetic Association warns that while childcare regulations represent minimum standards, there is a danger that some might aim for these only, rather than striving to achieve best practice (American Dietetic Association, 2011), while Padget and Briley (2005) caution that unless nutrition regulations are specific, pre-schools can be compliant to these without the need to supply sufficient food. Instead pre-school managers, and health professionals working with pre-schools, should encourage services and their staff to prioritise health related habit formation amongst children due the long reaching effect that these habits may have (Batsell *et al.*, 2002; teVelde *et al.*, 2007; Telama, 2009). A study in the United States found that although child care policy may have a positive effect on promoting some healthy carer behaviours at mealtimes, policy alone may not be sufficient to promote staff to consume healthy food with children when children are eating (Erinosho *et al.*, 2012). While the Healthy Incentive for Pre-schools project

encourages policy development; this is but one element of an overall package to empower pre-schools to become health promoting.

The randomisation of the pre-schools into two intervention training groups, one group receiving a resource intensive intervention comprising of staff training in addition to manager education, and the second group receiving an intervention requiring significantly fewer resources, and which entailed training the manager of the pre-school only; enabled an analysis of whether staff training conferred any additional benefit on the outcomes measured. Contrary to expectation, and the initial study hypothesis, the provision of staff training did not have a significant effect on the overall outcomes measured. This finding is useful, particularly in the current economic environment in which resources are scarce. Given the added cost to the health service of providing staff training, and the difficulties in releasing staff for training from the pre-schools' perspective, the finding that 'manager only' training can deliver results equivalent to a more intensive intervention is welcome, both from the viewpoint of pre-schools and the health service.

The use of the Pre-school Health Promotion Activity Scored Evaluation Form and its associated classification system, supported by education, acted as a motivational tool for pre-school services, with significant improvement in overall practices observed with the majority moving from a Participation classification to a higher classification post-intervention. The education provided detailed specific actions for pre-schools to follow, which were in the form of criterion standards for best practice, bringing clarity to the task of determining what changes are required and how these can be implemented. With direct observation being described as a 'gold standard' (Gittelsohn *et al.*, 1994), the findings in this study confirm that a significant difference existed between the scores assigned by the direct observation method in comparison to those

conferred by self-assessment, with the latter scoring being significantly more generous. While a number of initiatives (Benjamin *et al.*, 2007a; Bravo *et al.*, 2008) have in the past relied on self assessment of practice, the results of this study would confirm the need to interpret any findings based on self assessment with caution and inform the direction of funding away from ‘whole staff training’ and towards the need for independent observation. A concern about quality in childcare provision has led to the development of quality improvement initiatives aimed at improving standards above the minimum (Mooney, 2007) rewarding better higher quality in pre-schools with better funding (Organisation for Economic Co-operation and Development, 2006). The motivational aspect of the classification system in the Healthy Incentive for Pre-schools project is similar to that outlined by Sisson *et al.* (2012). Considering the important and positive results of this study it would be important that pre-schools engaged in such practice would be motivated and encouraged to remain committed to the pursuance of quality through a suitably developed remuneration scheme (Organisation for Economic Co-operation and Development, 2006; Mooney, 2007).

In summary, the introduction of the Healthy Incentive for Pre-schools project in full day care pre-school services in the midlands of Ireland demonstrated that children studied in this setting may be at risk of: nutritional deficiency; poor food habit formation; and inadequate physical activity and outdoor time, due to the food and health practices observed. The implementation of a motivational intervention based on the introduction of, and training with, a Pre-school Health Promotion Activity Scored Evaluation Form and Pre-school Education Resource Pack, has led to significant improvement in overall nutrition and health practice. Randomisation of participating pre-schools into two intervention groups tested the benefit of training staff in addition to the pre-school manager in each service, with no significant benefit being attributed to

staff training. Investigation of self-assessment as a potential project evaluation tool demonstrated this method to be significantly different to the gold standard method of direct observation. The introduction of this project to other pre-schools offering a full day care service in Ireland has the potential to encourage and motivate such services to follow best practice guidelines and so enhance the quality of the nutrition and health related experience for children in these settings. To this end, the testing of the Healthy Incentive for Pre-schools project in other locations in Ireland would be very important.

## **7.4 Key Project Recommendations**

A number of recommendations are suggested based on the project findings and a review of current best practice literature.

### **7.4.1 National approach to governance of best practice care for children**

Considering the importance that can be apportioned to the development of quality in the childcare setting (Growing Up in Ireland, 2013), it is of great concern that in 2008 the Irish government disbanded the organisation charged with overseeing the development of quality and policy in the early years setting, the Centre for Early Childhood Development and Education (Centre for Early Childhood Development and Education, 2008). By 2011, no national plan for early childhood care and education had been put in place in Ireland, and although the government in 2012 announced that Ireland's first National Strategy for the Early Years would be developed that year, to date this has still not yet been published (Growing Up in Ireland, 2013).



Considering that this study demonstrated that there is an enthusiasm amongst pre-school managers to embrace new concepts, with many pre-schools becoming involved in the project process during a time of intense economic pressure, there is now a need to harness and drive this at a national level, with a co-ordinated quality policy approach. The implementation of a national policy to encourage all pre-schools providing full day care services across the country to follow best health related practice and to provide adequate nutrition is warranted. In 2006, the Organisation for Economic Co-operation and Development (OECD) suggested (Organisation for Economic Co-operation and Development, 2006) that public services ‘*do not legislate sufficiently for the child care sector, or do not enforce quality standards or fail to provide sufficient incentives for providers to comply*’ and added that in some countries such as Ireland ‘*private provision in the child care sector tends to be exempt from all but minimal health and safety rules*’. It has, however, been suggested that when government regulation, licensing and programme standards are introduced in this sector it ‘*consistently leads to improvements in quality*’ (Fiene, 2006). With this in mind it would be imperative that a national view and co-ordinated approach is taken, to the implementation and monitoring of an incentive scheme such as the Healthy Incentive of Pre-schools’ project. A scheme that includes: an incentive aspect; visits to observe and monitor practice; and provides education and training for key personnel, in this case the pre-school manager, ensures that practice changes would be encouraged and assessed on an ongoing basis.

The value placed on the health and development of children in full time care in Ireland must be examined by policy makers and parents alike. The quality of care that a child receives has a huge impact on its health, growth and development both physical and psychological. While it would appear that much focus is placed on the teaching of

literacy and numeracy to children in this setting, pre-intervention findings from this study would suggest that the development of healthy gross and fine motor skills, the provision of adequate food, physical activity and outdoor time and the development of children's healthy association with food is perhaps sometimes forgotten. These aspects of early childhood care should be afforded at least equal importance by parents and caregivers as the much lauded necessity to focus on literacy and numeracy. There is a need for standardisation of practice monitoring in relation to the very basic life essentials of adequate nutrition and physical activity in this age group. Funding should be directed into training providers to the best possible standard in relation to these necessities.

To date, the statutory regulations that govern pre-school nutrition (Regulation 26 Food and Drink) require that '*a person carrying on a pre-school service shall ensure that suitable, sufficient, nutritious and varied food is available for a pre-school child attending the service*' (Department of Health and Children (Ireland), 2006). As this statement stands, it is open to interpretation and a need for clarity and definition is warranted (Padget & Briley, 2005). The Healthy Incentive for Pre-schools project sought to define and clarify practice standards in this regard, with the Pre-school Health Promotion Activity Scored Evaluation Form and Pre-school Education Resource Pack outlining 'best practice standards' relating to all aspects of nutrition and health related practice, thus enabling measurement and comparison of practice to these standards. Contrary to this, specific assessment criteria are not standardised on the national inspection tool for the following: constituents of a meal and snack; definitions of healthy drinks and when should these be served; appropriate serving sizes of protein, carbohydrate, dairy and fruit and vegetables. There is a national need for transparency in relation to food provision so that all inspection teams and all pre-school providers are

clear on what is considered best practice in relation to nutrition for children's growth and development on a daily basis in this setting.

Adequate physical activity and outdoor time provision is recommended for this age group. The Healthy Incentive for Pre-schools project determined during the pre-intervention phase that in the majority of services basic physical activity provision was not occurring. The significant improvement in practice post-intervention was an extremely important finding considering the increased incidence of overweight and obesity and its associated costs (*safefood*, 2012). Policy makers must ensure that children in pre-schools are obtaining both adequate physical activity and outdoor time on a daily basis in line with international best practice. Ongoing assessment and monitoring of pre-schools' progress, as in the Healthy Incentive for Pre-schools project, would be integral to this.

#### **7.4.2 National approach to training of pre-school providers**

Currently in Ireland, a piecemeal approach to the training/education given to pre-school workers regarding nutrition, health, physical activity and outdoor time for children exists. A standardised approach to the education of providers in relation to the importance of health and nutrition is required. However, with a recent OECD report (Organisation for Economic Co-operation and Development, 2006) outlining the disparities between qualifications and training of pre-school providers across the OECD countries; it would appear that it is not only in the area of health that Ireland's approach to pre-school provider training differs from other countries. While in many countries such as Norway, the education of pre-school teachers is university-based and is akin to that of a primary school teacher (Organisation for Economic Co-operation and Development, 2006), in Ireland it is only in recent times that a focus has been placed on encouraging

pre-school providers to obtain university qualifications (O'Kane, 2007). The provision of a practice based university training, that encompasses key learning for potential providers, is essential to ensure that those working in this setting have an understanding of the importance of best practice in relation all aspects of child care and development, including nutrition and health, and the skills and motivation to make best practice the norm in the pre-school setting.

### **7.4.3 Provision of supports to pre-schools**

There is a need to build confidence in pre-school providers, as a group, regarding their role in implementing best practice for children in relation to health. Pre-school providers require assistance and tools to equip and encourage them to liaise and communicate effectively with parents, and the confidence to challenge unhealthy behaviours and practices which parents suggest or request. Information campaigns should be generated outlining best practice with regard to food, physical activity and outdoor time habit development, and the important and necessary role of the parent and caregiver in healthy habit formation. Pre-school providers outlined that parent attitude and influence can have a negative impact on practice in the pre-school setting. Encouraging parents to also adopt the healthy habits being advocated for the pre-school setting is essential to ensuring consistency and seamless best practice provision between the childcare setting and the home environment (McKay, 2008).

Acknowledgement must be given to the difficult economic environment in which the Irish pre-school service, and its clients, Irish parents, now exists. There appears to be a link between food provision and its cost; with those that are concerned about profits reporting that they are less likely to offer new foods or adequate food variety (Lloyd-Williams *et al.*, 2011). Provision of grant aiding for healthy drinks and

food, or food stamps/ vouchers for food, was suggested by pre-schools through the Delphi investigation and such provision could help prevent food being the primary cost consideration in the future, indeed evidence from the United States would suggest that the provision of this form of incentive is linked to quality improvement in this setting (Fiene, 2006).

While it is acknowledged that pre-school providers play a huge role in the development of a child, this role may not be valued or respected at a societal level. In Ireland, there is a need for open debate on the important task of pre-school providers. Respect and remuneration, together with the provision of appropriate training and qualification, is necessary to ensure that society appreciates fully this groups' valuable responsibility in the shaping of the nation's future generations. In fact, the incentive request of pre-school managers for recognition of their work in this study, generated through the Delphi investigation, may reflect the important need there is for society to recognise workers in this setting for the valuable contribution that they can make to a child's development. With providers expressing the view that some parents worry more about the cost of their child's care than the type of food provided (Moore *et al.*, 2005), and a call for improvement in quality of childcare provision through the promotion of recognition and respect, training, wages and policies to support workers in this setting (Shapiro Kendrick, 1994; Early & Winton, 2001; Benjamin *et al.*, 2009b), the identification of recognition as a 'very helpful' potential aspect of the Healthy Incentive for Pre-schools project is both relevant and pertinent.

#### **7.4.4 Cost effective approach to project assessment and support**

While the Healthy Incentive for Pre-schools project determined that self-assessment, using the Pre-school Health Promotion Activity Scored Evaluation Form, attributes

significantly different scores to practice than direct observation by an independent observer. It was not possible for the Pre-school Inspection Team to use the Pre-school Health Promotion Activity Scored Evaluation Form due to their current remit. Therefore, it would be important that further investigation is undertaken to determine the best and most cost-effective method of Pre-school Health Promotion Activity Scored Evaluation Form assessment for the future. Currently in the Midlands, pre-schools in the Healthy Incentive for Pre-schools project, are being followed up, and supported, by a trained dietitian working on a contract basis. It will be helpful to determine the cost benefit of this approach to enable replication in other areas in the future.

#### **7.4.5 Voice of the Irish pre-school child**

Further investigation into the ‘Voice of the Child’ in relation to food and food experiences in full time pre-school care is justified. The learning generated from the experience in this project should be used to facilitate future research; ensuring that the attainment of ethical approval does not again become an obstacle to the collection of valid data in this important area of study.

#### **7.4.6 Advice to other Community Nutrition & Dietetic Services undertaking similar projects**

This study has demonstrated that a co-ordinated approach to the issue of nutrition and health related practice in pre-schools is warranted. Previous research has questioned the validity of self-reported practices in this setting and this project has noted that self-assessment results differed greatly from observation undertaken by a qualified dietitian.

With this in mind, the practice of training pre-school providers by community dietitians or other health professionals, without sufficient observation based follow-up to ascertain change in practice, should be reconsidered.

The use of the Pre-school Health Promotion Activity Scored Evaluation Form to evaluate pre-intervention practice in another geographical area would add further evidence to this approach, and would be welcomed. The finding that training the manager solely with the Pre-school Education Resource Pack is sufficient to elucidate results similar to those obtained with additional staff training is of great benefit to work planning, as resources needed to implement such an initiative in another area would not be cost prohibitive.

The importance of developing links with relevant stakeholders is crucial to the success of replicating a project such as this in another health service area. Developing an active Local Expert Group comprising of the Health Service Executive Pre-schools' service and the Pre-school Inspection Team was extremely important to the development and progress of this project. The creation of such a group before commencing any pre-school intervention in another geographical area would be vital to the project's transferability. Added to this is the necessity to develop a good communication link with pre-schools in the project; with verbal communication being found to be very necessary, particularly in terms of feedback to pre-schools after data collection visits.

Finally there is a need for community dietitians to engage with various government departments to advocate for a national, rather than fragmented approach to the funding of supports to the childcare setting. A number of different agencies co-ordinates a variety of initiatives for the early education sector. The School Milk Scheme is available for community pre-schools and primary schools, and is subsidised

by the European Union and operated by the Department of Agriculture, Food and the Marine in association with the National Dairy Council. While the Food Dudes Healthy Eating Programme, that receives financial support from the Department of Agriculture, Food and the Marine and the European Union scheme but is managed by Bord Bia, is only available for the primary school sector. The development of an overarching support system with one point of contact and a transparent pathway to funding application would be extremely beneficial to support the accessing of these schemes. Extension of schemes such as the School Milk Scheme and the Food Dudes Healthy Eating Programme to all pre-schools is warranted. Schemes that would provide grant aiding for iron provision, physical activity, and outdoor equipment and clothing, in association with measured quality pursuance should also be explored at a national level.



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## **Appendices**

## Appendix 1

### Ethical approval obtained from the Research Ethics Committees of the Health Service Executive Dublin Mid-Leinster (Midland Area)



Feidhmeannacht na Seirbhíse Sláinte  
Health Service Executive

Department of Public Health /Population Health Directorate  
HSE – Dublin/Mid-Leinster  
FSS - Baile Átha Cliath & Lár Laighin  
HSE Area Offices  
Arden Road  
Tullamore  
Co. Offaly

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11<sup>th</sup> June 2007

Ms Charlotte Johnston  
Snr Community Dietician  
Community Nutrition and Dietetic Service  
Marlinstown Office Park  
Marlinstown  
Mullingar  
Co. Westmeath

**RE: Attack on Snack - the development and implementation of a healthy food incentive scheme in the pre-school setting**

Dear Ms Johnston,

The Research Ethics Committee met on the 6<sup>th</sup> of February and your application was considered.

Thank you for providing the clarifications as requested and we note the exclusion of anthropometry on the children.

The Chair has reviewed the amendments and is happy now to grant REC approval.

Yours sincerely,

**Laura Smith**  
**REC Secretary**  
On behalf of  
**Dr. Helena Stokes**  
**REC Chairperson**

*File copy: June 2007*

## Appendix 2

Ethical approval for this study was obtained from the Research Ethics Committee of Dublin Institute of Technology

FROM THE OFFICE OF GRADUATE STUDIES / Ó OIRIG STAIDÉIR IARCHEIME:

4<sup>th</sup> February 2008

**Ms Charlotte Johnston Molloy**  
HSE Dublin Mid Leinster  
Community Nutrition and Dietetic Service Offices  
Marlinstown Office Park  
Marlinstown  
Mullingar  
Co. Westmeath

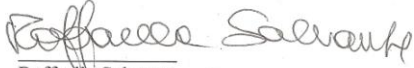
**Re: Research Ethics Submission Ref. No. 03/08**


Dear Charlotte,

Thank you for submitting an application for research ethics for your project "*Attack on Snack, etc*" (ref. 03/08)

The DIT Research Ethics Committee has reviewed your submission at a meeting on 29<sup>th</sup> January and has agreed to grant ethical approval to your project.

Kind regards,

  
Raffaella Salvante  
Office of Graduate Studies

  
dublin institute of technology  
institiúid teicneolaíochta bhaile átha cliath

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cearnóg mhúiseo d1

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cathal brughá street d1  
sraid chathail brughá d1

aungier street d2  
sraid aungier d2

kevin street d8  
sraid chaomhín d8

rathmines road d6  
bothar rath maonais d6

upper mount street d2  
sraid an mhótaí uachtarach d2

chatham row d2  
rae chatham d2

portland row d1  
rae portland d1

temple bar d2  
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Living Learning



## Appendix 3

### Project protocol approved by Research Ethics Committees



#### Programme/Project Title:

#### **ATTACK ON SNACK – THE DEVELOPMENT, VALIDATION AND IMPLEMENTATION OF A HEALTHY FOOD INCENTIVE SCHEME IN THE PRE-SCHOOL SETTING**

#### Rationale

In reviewing best practice in reducing obesity and related chronic disease in children and young people, Flynn *et al.* (2006) noted that there are few interventions in the pre-school setting and recommended that funding should be directed to develop prevention programmes in this setting.

In 2001, the Community Nutrition and Dietetics, and the Pre-School Services of the HSE-Dublin Mid-Leinster Midland Area co-ordinated the development of a multi-stakeholder team approach to the nutrition training of pre-school providers (including environmental health officers, public health nurses, training officer, child minding advisory officer and pre-school services manager). This project falls under the remit of Population Health while the key stakeholders for service delivery are based within Primary, Continuing and Community Care (PCCC).

Nutrition training was carried out with pre-school providers. However, as it was not compulsory and uptake was poor, the HSE pre-school nutrition team felt that the commencement of a healthy food incentive scheme would encourage pre-schools to become involved in nutrition training and to implement changes in their food provision practices.

An initial study to explore the feasibility of such an incentive scheme in the Midlands of Ireland was carried out in 2004 (Guiden & Johnston, 2004). All of the pre-school nutrition team favoured the introduction of an incentive scheme, suggesting that it would facilitate nutrition education and act as an incentive for the implementation of healthy food policies in pre-schools. All the pre-school providers interviewed also supported the introduction of an incentive scheme, but identified lack of time and poor understanding of healthy eating for children as the main barriers to implementing healthy eating policies.

Following on from this investigation, a scored evaluation form designed to measure pre-school nutritional practices that was based on agreed best practice in the early childhood nutrition literature, was created by the pre-school nutrition team. Nineteen pre-school childcare facilities in Laois and Offaly were invited to take part in a pilot evaluation of their current nutritional practices using the scored evaluation form devised (De Siún & Johnston, 2005).

The aims of the pilot were to determine if the scored evaluation form was user friendly, understandable and practical; whether it was successful as a motivational tool; the time required to carry out the evaluation; problems associated with the evaluation from the perspective of the childcare facility; and the weighting of the scores assigned to each criterion within the evaluation.

The results of the pilot study demonstrated that the majority of facilities wanted more information on each criterion listed in the scored evaluation form (SEF). The information requested included: the rationale for each criterion being considered best practice; how meeting the criterion might benefit the pre-school facility and the children attending it, and examples of how best to implement each criterion. The need for information on nutrition and healthy eating was also identified, and it was noted by the researcher that the scoring system used in the SEF needed further investigation and validation.

Following on from this preliminary work it is proposed that the piloted scored evaluation form (SEF) of pre-school nutrition will be validated and that a study will take place to determine whether its use, in conjunction with a nutrition resource pack and training in this setting, motivates a positive change in practice, knowledge and food provision.

This project investigation is to be completed as a PhD. This will ensure that the work carried out will be of a high academic standard and that the data gathered will be peer reviewed. Linking this project in this way to academia will ensure that this project will be evidence based and recognised.

- For further background information please see **Appendix I**

### **Overall purpose**

- To develop a validated scored nutrition evaluation form (SEF) to improve the quality of food provision in the pre-school setting.
- To develop, deliver and evaluate a nutrition training programme to accompany the scored nutrition evaluation form (SEF) in the pre-school setting
- To write up the project to PhD level and disseminate findings.

### **Key objectives**

#### Phase 1:

- Devise and validate a scored nutrition evaluation form (SEF) for use in the pre-school setting which is based on the Department of Health and Children's (DoHC) 'Food and Nutrition Guidelines for the Pre-school Setting' and has the potential to be a motivational tool in a future incentive scheme.

- Carry out a baseline audit of all full day care Pre-schools registered with HSE Dublin Mid-Leinster in the Midland region using the scored evaluation form (SEF).

Phase 2:

- To develop a nutrition and healthy eating resource pack to accompany the scored nutrition evaluation form (SEF), including appropriate support materials as identified by the previous needs assessment.
- To investigate and develop an appropriate reward model that will act as motivation and incentive to participate in the programme.
- To deliver training on the scored evaluation form and the resource pack to Pre-schools registered with HSE Dublin Mid-Leinster in the Midland region, ensuring adequate representation from disadvantaged pre-schools.
- To measure change in nutritional practices post intervention using the validated scored evaluation form.

Phase 3:

- To write up the findings of the study and disseminate through peer review and submit for publication and PhD award

## **1. Project Scope**

***Study Overview:***

- Phase 1 of the study is cross sectional and will be qualitative and quantitative in nature. Phase 2 will be an intervention study, investigating data both qualitatively and quantitatively.
- The study will be based in the pre-school setting in the Midlands of Ireland.
- The study population will be full day care pre-schools who are registered with the Health Service Executive Dublin Mid-Leinster.
- The preparation phase of the project will involve:
  - Determination of food service in pre-schools & commitment to an incentive scheme
  - Formulation of an information resource pack
  - Validation of the scored nutrition evaluation form (SEF) for use in the intervention phase of the study.
  - Validation will necessitate the measurement of food provided within the pre-school setting, and inter-personal administration of the SEF.
- Pre-school assessment and training will be carried out and follow-up will involve the re-audit of nutritional practices using the SEF to monitor changes in practice.

***Selection of study population:***

- All pre-school providing full-day care to pre-school children in the Midland counties of Longford, Laois, Offaly or Westmeath and registered with the HSE Dublin Mid-Leinster Pre-school service will be eligible to take part in this study.
- As there are only 89 full day care pre-schools in the Midlands of Ireland it is important that all pre-schools are invited to become involved in the study.

- Pre-schools will be randomly assigned to an intervention (n=45) and a control group (n=44), ensuring that there is an adequate representation of community / disadvantaged pre-schools.

***Study Procedures:***

- A local HSE Dublin Mid-Leinster Midlands region pre-school nutrition working group / team has been established and gives its full support to the project proposal.
- For this study a national advisory/steering group has also been established to provide ongoing expertise for the initiative.

***Collection of data:***

**Preparation Phase (Phase I):**

- An initial investigation of food provision will take place via telephone questionnaire with all registered pre-school providers in the Midland region (n=89).
- As part of this telephone survey all full day care services will be asked about their commitment to take part in a healthy food incentive scheme.
- In order to validate the SEF, measurement of the food provided in these pre-schools will be undertaken and these data will be compared Food-Based Dietary Guidelines e.g. the Food Pyramid for this age group.
- The SEF will be used to determine the status of each school in the study and each school will be assigned a score using the SEF.
- Pre-schools (n= 89) will be randomly allocated to control and intervention groups. The control group (n= 44) will receive no intervention during the study period and the intervention group (n= 45) will receive training on the SEF and its accompanying information resource pack, from the researcher.

**Intervention Phase (Phase II):**

- An information evening will be carried out in each pre-school in the intervention group through a clustering system to highlight the project to staff and parents.
- An information resource pack will be developed to accompany the SEF;
  - It will be based on the Food and Nutrition Guidelines for pre-schools (DoHC) and will provide a user friendly, up-to-date and practical guide for pre-schools on nutrition and food service in this setting.
  - Its creation will be informed by the pilot evaluation of the SEF that has already been undertaken (De Siún & Johnston, 2005).
  - Resources such as leaflets and posters will also be developed to accompany this pack.
- The information resource pack will be piloted.
  - This will involve the delivery of the pack to a group of pre-school providers similar to those included in the study followed by a feedback session.

- Information resource pack training will be carried out in each pre-school with all staff; this training will be carried out with all pre-schools in the intervention groups.
  - All information and training will be food based and in plain English.
- Focus group investigation of pre-schools to determine their views on the most appropriate and motivating form of reward for the incentive scheme,
  - Discussion of various modes of reward delivery and reward types with pre-schools i.e. media launch with certificates; award ceremony etc

Evaluation Phase (Phase III):

- Post training, each pre-school in the intervention group will be revisited after a 2-week, 6-month and 12-month period and the SEF will be administered at each time point to determine scores /status and progress.
- The scored evaluation form will also be administered to the control group 12 months after initial assessment, to enable comparison to be made between the control and intervention groups.
- Qualitative investigation will be in the form of focus groups with stakeholder groups: pre-school team members, pre-school providers and parents and will be used to evaluate the process and outcomes of the programme.
- Focus investigation will also be used to ascertain the most motivating and suitable reward model for the programme.

***Storage and analysis of data:***

- An evaluation questionnaire analysing data at end of each training session will be carried out within the intervention group.
- Pre- and post analysis within groups and between groups will be carried out at 2 weeks, 6 months and 12 months.
- Qualitative analysis will be carried out with parents and pre-school providers and pre-school nutrition members to determine their views on key themes and areas.
- All food data collected will be entered into an Access database on a password-protected personal computer.
- Data will be analysed using a WISP (dietary analysis package) and SPSS (Statistical Package for the Social Sciences) by the Researcher.
- During the intervention stage, all participating pre-schools will be evaluated and re-evaluated using the validated SEF and assigned a score.
  - This score will then be used to describe the nutritional status of each facility.
  - This information will be entered into an Access database.
  - Pre-schools will be identified by code only.
  - SPSS will be used to compare pre-and post intervention scores and to compare the scores of the two groups.
- Focus groups will be recorded and transcribed verbatim.
  - They will then be analysed for common themes.
  - As before, only codes will be used to identify participants.

### ***Ethical considerations:***

- If beneficial effects of the intervention are observed, it will be important to return to pre-schools in the control group after this project is completed to facilitate their participation in the intervention phase.
- Ethical approval will be sought from the ethics committee of the HSE Dublin Mid-Leinster region in order to carry out the study.
- To ensure confidentiality all data collected will be coded on entering into the computer package; the computer will be password protected and all databases or transcripts of interviews will be destroyed on completion of the study
- Consent forms and information sheets will be created and used with all potential participants or their parents.
- Consent forms will include wording such as ‘candidates are under no obligation to complete the study and that they can withdraw at any time’; and that ‘all information will be dealt with in the strictest of confidence’.

### **What it will not be delivering**

This project **will not** be undertaking the following:

1. Collection of anthropometric data on pre-school children
2. Changing food provision outside the pre-school setting
3. Identifying individual dietary inadequacies
4. Work with Sessional pre-school services
5. Work with childminders
6. Work with pre-schools that are not registered with HSE Dublin Mid-Leinster

## **2. Major Deliverables**

### ***Stage deliverables/outputs***

#### **Preparation phase:**

- Set up steering group – identify key stakeholders
- Set up working group– identify key stakeholders
- Consultation at steering group and working group level on project proposal
- Preliminary preparatory work; development of scored nutrition evaluation tool, piloting and revision of same.
- Telephone questionnaire development and administration with registered full day care providers to determine commitment to healthy incentive scheme and to ascertain food provision in pre-schools in Midlands’ area.
- Validation of the scored evaluation form through collection of food provision data and comparison of these data with recognised Food-Based Dietary Guidelines for this age group.
- Randomisation of pre-schools into intervention and control groups, whilst ensuring true representation of community / disadvantaged pre-schools.
- Determination of status of each pre-school in the intervention and control groups using the scored nutrition evaluation. Assignment of score to each pre-school.

### Intervention Phase:

- Development of an information resource pack that accompanies the SEF.
- Delivery of in-house training on the information resource pack and SEF with each pre-school in the intervention group.
- Focus group investigation of pre-schools to determine their views on the most appropriate and motivating form of reward for the incentive scheme, i.e. media launch with certificates; award ceremony etc

### Evaluation Phase:

- Follow-up of each pre-school in the intervention group to determine progress and at 12 months follow-up to determine new status.
- Comparison between intervention groups and between control and intervention groups.
- Focus investigation to determine views of key stakeholders: pre-school nutrition team; pre-school providers and parents on the SEF and information resource pack as a potential motivational tool for changing practice.
- Focus investigation with pre-school providers and parents to determine the most appropriate reward mechanism to motivate change.

### Dissemination phase:

- Writing up study to submit as PhD.
- Dissemination of findings throughout, and at the end of the project, with ongoing publication in appropriate peer-reviewed journals.
- Use of local media and pre-school information leaflets and posters to encourage participation by parents.

### ***Final deliverables/outputs:***

1. If the nutrition resource pack and SEF are shown to be effective at providing the background support and motivation to change in this setting, the potential benefit on childhood nutrition is of both local and national significance within the pre-school setting, and has the possibility for adaptation to childminding facilities.
  - This project aims to measure change in practice, knowledge and food provision.
  - Positive changes in these areas in the pre-school setting will ultimately lead to improved nutritional practices in the pre-school setting and improved nutrition status of children.
  - This pilot project can be easily transferred to a National platform and have a significant impact on nutrition in the pre-school setting in the future.
2. This project will, for the first time in Ireland, collect data on both food service in Irish pre-schools, vital for determining future interventions and the resource implications of healthy nutritional practices in this setting.
  - It is being carried out using current structures and utilising various stakeholders within and external to HSE. A partnership approach is vital to

its success, and forward planning will prevent replication and reinvention of input into the pre-school setting in the future.

3. Writing up and submitting this project as a PhD will ensure that the project is based on best practice and undergoes peer review and dissemination.

#### **4. Project Dependencies**

##### *External factors*

- Lack of coherent national planning on pre-school nutrition within all key stakeholder groups with regard to health promotion
  - i.e. PCCC; Population Health; Department of Health and Children; Department of Agriculture; Food Safety Promotions Board; Food Safety Authority of Ireland.....

##### *Interdependencies (e.g. links to other work, directorates etc)*

- Stakeholder co-operation
- Information provision / updates to funding sources
- Parental support for the project
- Pre-school commitment
- Pre-school staff involvement
- Clear project planning
- Open communication
- Budget management
- Research and statistics support
- Interface between PCCC & Population Health

#### **5. Project Governance**

##### *Steering Group members: – overseeing the project*

- Dr. Cliodhna Foley Nolan
  - Safefood
  - Consultancy & partnership role
- Dr. Marian Faughnan
  - Safefood
  - Consultancy & partnership role
- Dr. Clare Corish
  - Lecturer in Human Nutrition and Dietetics, Dublin Institute of Technology
  - Research supervisor
- Dr. John Kearney
  - Lecturer in Biostatistics and Nutritional Epidemiology, Dublin Institute of Technology
  - Research supervisor
- Ms. Corina Glennon Slattery
  - Community Dietitian Manager, HSE-Dublin Mid-Leinster
  - Project chair



- Ms. Sheilagh Reaper Reynolds
  - Health Promotion Functional Manager, HSE Dublin Mid-Leinster
  - Consultancy & partnership role
- Ms. Charlotte Johnston Molloy
  - Senior Community Dietitian
  - Researcher
- Dr. Nóirín Hayes,
  - Director Centre for Social and Educational Research, Faculty of Applied Arts,  
&  
Faculty Head of Learning Development,  
Dublin Institute of Technology.
- Combat Poverty
  - Representation request
  - TBC ( to be confirmed)
- Healthy Food for All
  - Representation request
  - TBC ( to be confirmed)
- National Children’s Nurseries Association
  - Representation request
  - TBC ( to be confirmed)
- Irish Preschool Playgroups Association
  - Representation request
  - TBC ( to be confirmed)
- Office of the Minister for Children
  - Representation request
  - TBC ( to be confirmed)
- Representative from Pre-school Inspection Teams
  - National / local –
  - TBC ( to be confirmed)
- Ms. Kara Murphy
  - Pre-schools’ Training Officer
  - TBC ( to be confirmed)

***Programme/Project Manager:***

Ms. Charlotte Johnston Molloy

***Project Team/ Working Group Members:***

- Ms. Kara Murphy
  - pre-schools’ training officer
- Ms. Anne Gerety
  - Public Health Nurse - Pre-school inspection team
- Ms. Deirdre Molloy
  - Public Health Nurse - Pre-school inspection team
- Ms. Ann Spain
  - Pre-school Service manager
- Ms. Patricia Moran
  - Environmental health Officer - Pre-school inspection team

- Ms. Louise Meehan
  - Environmental health Officer - Pre-school inspection team
- Ms. Caroline O'Connor Hughes
  - Childminder advisory officer
- Ms. Fiona McHugh
  - Childminder advisory officer
- Two Pre-school Providers
  - TBC ( to be confirmed)
- Two Pre-school parents
  - TBC ( to be confirmed)

## **6. Project Timescales**

### ***Key milestones***

#### **Task 1: (January 2008 to December 2008):**

Jan – September 2008:

- Initial audit of food service and commitment to project
- Validation of Scored Evaluation Form (SEF) through various methodologies.

July - August 2008

- Write up and input of data collection
- Draft thesis chapter and conference abstract /paper on baseline findings in pre-schools, development and validation of SEF.

September - December 2008:

- Administration of SEF to all pre-schools enrolled in the study
- Allocation of status score to each pre-school
- Randomisation of pre-schools into intervention and control groups
- Development, focus test and finalise information
- Resource pack and training to dovetail with SEF

#### **Task 2: (January 09 to December 09):**

Jan 09 – August 2009:

- In house parent / staff information evenings for intervention group on incentive scheme on a cluster basis.
- In-house training of pre-schools in intervention group on SEF and information resource pack on a cluster basis.
- Focus investigation amongst pre-school providers regarding most appropriate reward scheme
- Re-audit of preschools 2 weeks post intervention

April – December 2009

- Analysis of data collected
- Write up and submission of work to date for abstract/ papers
- Re-audit of pre-schools 6 months post-intervention

#### **Task 3: (January 2010 to December 2010):**

Jan – April 2010

- Re-audit of intervention group at 12-month time period
- Re-audit of control group at 12-month time period
- Comparison of pre - & post intervention and intervention and control status

April -December 2010:

- Qualitative focus group investigation with parents, pre-schools and pre-school inspection teams to determine their views on nutrition incentive scheme process and outcomes

Jan – December 2010

- Literature review, analysis and write up throughout year

**Task 4: (January 2011-December 2011):**

Jan – April 2011

- Data analysis
- Award / certification / acknowledgement of pre-schools in intervention group as appropriate
- Media campaign to highlight scheme and pre-schools involved

April – Dec 2011:

- Write up of project for submission as PhD
- Preparation of abstracts and papers
- Dissemination of findings on national & international level

**7. Project Risks**

*Identify risks that might threaten the project*

- Lack of funding / inadequate funding
- Lack of short / long-term funding of project
- Lack of commitment and support at national level

*How they will be managed*

- Short, medium and long-term planning
- Having direct links / representation of senior management on steering committee

**10. Additional Information**

- If the information resource pack and scored evaluation form (SEF) are shown to be effective at providing the background support and motivation to change in this setting, the potential benefit on childhood nutrition is of both local and national significance within the pre-school setting, and has the possibility for adaptation to childminding facilities.
- This is a national project that will be piloted on a local level. The linkage with academia will mean that the evidence and data will be peer reviewed and will be seen as best practice.
- Dissemination of information gained from this project is vital to ensure that the project moves from this pilot stage to its place at a national level.
  - The following outlines the plan to disseminate information/results during and at the conclusion of the research study:
    - The establishment of an Advisory Committee will provide support and opportunities for dissemination of results throughout and at the end of the project.
    - Presentation of the findings to senior HSE managers in Population Health and PCCC who in turn can disseminate the findings to their colleagues in other HSE regions.

- Inclusion of key staff and regular presentation to Food Safety Authority of Ireland & Food Safety Promotion Board.
- The Irish Nutrition and Dietetic Institute, the professional body for Dietitians in Ireland, can provide a focus for dissemination of results; the Community Dietitian Managers Group being in a position to implement the project findings; the 'INDI Matters' newsletter being received by all members; and the Paediatric Special Interest Group having a specific interest in childhood nutrition.
- Project support has been agreed by the Health Promotion Policy Unit, Department of Health and Children regarding the project proposal. Regular updates to this Unit are seen as essential.
- Presentation to Community Paediatricians who could disseminate to their colleagues.
- It would be important to disseminate this information in the UK through the British Dietetic Association, their newsletter, community nutrition group and scientific journal.
- The national health promotion / public health conferences would also provide an appropriate forum to disseminate findings.
- Ongoing publication in appropriate peer-reviewed journals.
- The multi-stakeholder pre-school nutrition working group will also provide a forum for dissemination throughout and at the end of the project:
- Presentations and newsletters to Environmental Health Officers and Public Health Nurses as key members of the pre-school inspection teams and also to county childcare committees and the pre-school providers.
- Use of local media and pre-school information leaflets and posters to encourage participation by parents.

To date the following reports and abstracts have been written in preparation for this study:

Abstracts:

- An exploration of the feasibility of a healthy food incentive scheme in the pre-school setting. **Johnston Molloy, C.**, Guiden, H., Corish, C.A., Kearney, J. & Glennon, C. (2007). Accepted for Oral Communication, 3<sup>rd</sup> International Consumer Sciences Research Conference, Belfast.
- A study to determine the view of Irish pre-schools, on the use of a scored evaluation form as a motivational tool, to improve food provision in this setting. **Johnston Molloy, C.**, DeSiún, A., Kennelly, S. & Glennon Slattery, C. (2007). Accepted for Poster Communication, British Dietetic Association Conference, Belfast.
- An exploration of food provision, and commitment to the introduction of a nutrition incentive scheme, in the pre-school setting. **Johnston Molloy, C.**, Murtagh, M., Corish, C.A., Kearney, J. & Glennon C. (2007). Accepted for Oral Communication, Nutrition Society Summer Meeting, Coleraine.

#### Publications:

- **Molloy, C.J.**, DeSiún, A., Kennelly, S. & Slattery, C.G. (2007). A study to determine the view of Irish pre-schools, on the use of a scored evaluation form as a motivational tool, to improve food provision in this setting. *J. Hum. Nutr. Diet.* **20**, 382A.
- **Johnston Molloy, C.**, Murtagh, M., Corish, C., Kearney, J. & Glennon, C. (2007). An exploration of food provision, and commitment to the introduction of a nutrition incentive scheme, in the pre-school setting. *P. Nutr. Soc.* **66**, 109A.

#### Reports:

- De Siún, A. & Johnston, C. (2005) *Pilot of the 'Healthy Attack on Snack' Pre-School Initiative*. Community Nutrition & Dietetic Service, Midland Health Board, unpublished.
- Guiden, H. & Johnston, C. (2004) *An Evaluation of Food and Nutrition Training Received by Pre-School Providers and Determination of a "Healthy Food Award" Scheme in the Pre-School Setting of the Midland Health Board*. Community Nutrition & Dietetic Service, Midland Health Board, unpublished.

#### ***Appendix I to project proposal***

Many studies have demonstrated the importance of good nutrition at an early age for healthy physical, psychological and social development (Lozoff *et al.*, 2000), and the link between poor nutrition and chronic disease risk in life (Ebbeling *et al.*, 2002). Attention to the quality of early nutrition plays a pivotal role in determining obesity and chronic health related diseases in later life (Department of Health, 2002); with studies now demonstrating that children who exhibit early 'adiposity rebound' (a second rise in BMI that occurs across the centiles between ages 3 and 7) have an increased likelihood of being overweight and obese during adolescence (Rolland-Cahera *et al.*, 1984) and adulthood (Whitaker *et al.*, 1998).

It is acknowledged that nutrition education is a key constituent of lifelong healthy eating and should start from the early stages of life (Perez-Rodrigo & Aranceta, 2001). Flynn *et al.* (2006) in reviewing best practice in reducing obesity and related chronic disease in children and young people, noted that there are few such interventions in the pre-school setting and recommended that funding should be directed to develop prevention programmes in this setting.

In Ireland, there has been an increase in obesity and overweight observed in children with the National Children's Food Survey (Irish Universities Nutrition Alliance, 2005) reporting a 2-fold increase in overweight in boys and a 3-fold increase in obesity in girls since the Irish National Nutrition Survey of 1990 (Irish Nutrition and Dietetic Institute, 1990). The report of the National Taskforce of Obesity (Department of Health and Children, 2005) notes that excess body weight is now the most common childhood disease in Europe, with some countries having as many as one in three children overweight or obese. One of its many recommendations is that the HSE, in implementing the Childcare Regulations 1996 and (Amendment) Regulations 1997, should ensure that pre-school services support healthy eating and healthy living.

The pre-school is a relatively new setting in the Irish landscape with the number of children attending pre-school for full-day care increasing rapidly in recent years. The National Childcare Strategy 2006-2010 (National Children's Office, 2006) aims to develop the childcare infrastructure in Ireland; it has a budget of €575million, and it is

estimated that this will lead to an increase of 50,000 childcare places. ‘The Food and Nutrition Guidelines for Pre-School Services’ (Department of Health and Children, 2004) recommend that children in full day care (more than 5 hours) are offered at least two meals and two snacks whilst in the pre-school. Currently in Ireland there is no uniform formal training, for pre-school providers, in the area of nutrition and healthy food provision, nor the legislation to enforce such training. As Food & Nutrition Guidelines for pre-schools are not mandatory, methods to encourage the provision of nutritious food in this setting must be pursued.

In 2001, the Community Nutrition and Dietetics, and the Pre-School Services of the HSE-Dublin Mid-Leinster Midland Area co-ordinated the development of a multi-stakeholder team approach to the nutrition training of pre-school providers. This project falls under the remit of Population Health while the key stakeholders for service delivery are based within Primary, Continuing and Community Care (PCCC). Nutrition training was carried out with pre-school providers. However, as it was not compulsory and uptake was poor, the HSE pre-school nutrition team felt that the commencement of a healthy food incentive scheme would encourage pre-schools to become involved in nutrition training and to implement changes in their food provision practices.

An initial study to explore the feasibility of an healthy food incentive scheme in the Pre-school setting in the Midlands of Ireland was carried out in 2004 (Guiden & Johnston, 2004). A structured telephone questionnaire was used to obtain the views of both the pre-school nutrition team and pre-school providers on such a scheme. The pre-school nutrition team (including environmental health officers, public health nurses, training officer, child minding advisory officer and pre-school services manager) oversees nutrition interventions in the pre-school setting; the pre-school providers are predominantly the care assistants directly involved with the daily care of the children.

All of the pre-school nutrition team favoured the introduction of an incentive scheme, suggesting that it would facilitate nutrition education and act as an incentive for the implementation of healthy food policies in pre-schools. All the pre-school providers interviewed also supported the introduction of an incentive scheme, but identified lack of time and poor understanding of healthy eating for children as the main barriers to implementing healthy eating policies.

Although all respondents supported a healthy food incentive scheme in principle, barriers to implementation of healthy eating and participation in an incentive scheme were highlighted. The support mechanisms identified by the pre-school providers to ensure participation in such a scheme and the effect of the scheme needed to be further investigated.

Following on from this investigation, a scored evaluation form of pre-school nutrition, based on agreed best practice, was created by the pre-school nutrition team. Nineteen pre-school childcare facilities in Laois and Offaly were invited to take part in a pilot evaluation of their current nutritional practices using the scored evaluation form devised (De Siún & Johnston, 2005).

The aims of the pilot were to determine if the scored evaluation form was user friendly, understandable and practical; whether it was successful as a motivational tool; the time required to carry out the evaluation; problems associated with the evaluation from the perspective of the childcare facility; and the weighting of the scores assigned to each criterion within the evaluation.

The evaluation was administered by first observing mealtime practices during the main meal of the day. The researcher then went through each criterion on the list with the owner or manager to get their feedback. The feedback focussed on four main

areas i.e. whether each criterion was fully understood; did staff agree with a need for improvement as part of each criterion; exploring the feasibility of implementing improvements in each criterion area; and any issues regarding resources and staffing for each criterion.

The results of the pilot study demonstrated that the majority of facilities wanted more information on each of the criterion listed in the scored evaluation form (SEF). The information requested included: the rationale for each criterion being considered best practice; how meeting the criterion might benefit the pre-school facility and the children attending it, and examples of how best to implement each criterion.

The study noted that while frequently there was no comprehension of the need for change, e.g. why a written healthy eating policy would be of benefit; when the reason for the criterion on the scored evaluation form (SEF) was explained, most facilities were eager to change. The need for information on nutrition and healthy eating was also identified. Finally, it was noted by the researcher that the scoring system used in the SEF needed further investigation and validation.

It is now necessary to modify and validate the SEF to ensure that the tool achieves what it sets out to do, i.e. that the score that a service achieves actually reflects their current practice. Based on the needs identified in the pilot evaluation, a nutrition and healthy eating information resource to accompany the SEF must also be developed to support pre-schools. The effectiveness of a system of regular evaluation of pre-school nutrition practices, supported by appropriate education and information, to change behaviour in this setting must then be assessed.

Following on from this preliminary work it is proposed that the piloted scored evaluation form (SEF) of pre-school nutrition will be validated and that a study will take place to determine whether its use in conjunction with a nutrition resource pack and training, in this setting, motivates a positive change in practice, knowledge and food provision.

This project investigation is to be completed as a PhD, this will ensure that the work carried out will be of a high academic standard and that the data gathered will be peer reviewed. Linking this project in this way to academia will ensure that this project can be looked upon as a model of good practice both nationally and internationally.

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## Appendix 4

### Pre-school provider consent form – pilot (phase 1)



#### **'HIP (Healthy Incentive for Pre-Schools) Project'**

Charlotte Johnston Molloy, Senior Community Dietitian,  
Community Nutrition & Dietetic Service,  
HSE Dublin Mid-Leinster,  
Marlinstown Office Park, Mullingar,  
Co. Westmeath.

Tel: 044 93 53220 / Mob: 086 6012160 / email: charlotte.johnston@hse.ie

#### **'Healthy Incentive Scheme (HIP) Project'**

#### **Scored Evaluation Form - Pilot Phase - Consent form**

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- ◆ I have had the process of today's **'HIP Project' Scored Evaluation Form Pilot** explained to me and I understand this process.
- ◆ I have had the opportunity to ask questions and discuss the **'HIP Project' Scored Evaluation Form Pilot** visit.
- ◆ I am satisfied with the answers that I have received to all my questions.
- ◆ I understand that during this visit the Community Dietitian will be:
  - ◆ Observing food and nutrition practice
  - ◆ Filling in the **Scored Evaluation Form**
  - ◆ Determining if the **Scored Evaluation Form** needs alteration & modification.
- ◆ It has been explained to me, and I agree, that the information gathered during this visit will be collated with that from other pre-school visits to ensure anonymity, and that the information collected from the overall pilot phase will be written up as a report, and may be submitted for conference presentation, and to scientific journals for publication.
- ◆ I understand that all information gathered during the **'HIP Project' Scored Evaluation Form Pilot** will be used to modify and enhance the development of the **Scored Evaluation Form**.
- ◆ I understand that all information gathered will be treated with the utmost confidence by the Dietitian, and that all **Scored Evaluation Forms** will be destroyed on completion of the pilot project. I also understand that all details of the pilot visit will remain anonymous at all times.
- ◆ **I note that I am free to withdraw my consent at any time, without giving a reason, and without affecting any nutrition activities which may be offered to me in the future. I understand and agree to all the**

**above details and I consent to allow the pilot of the 'HIP Project'  
Scored Evaluation Form to take place in this pre-school today.**

**Signed:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Print name:** \_\_\_\_\_

**Position:** \_\_\_\_\_

**Name of Pre-school:**

\_\_\_\_\_

**Signature of Dietitian:** \_\_\_\_\_

**Date:** \_\_\_\_\_

## Appendix 5

### Pre-school provider information sheet – pilot (phase 1)



#### **‘HIP (Healthy Incentive for Pre-Schools) Project’**

Charlotte Johnston Molloy, Senior Community Dietitian,  
Community Nutrition & Dietetic Service,  
HSE Dublin Mid-Leinster,  
Marlinstown Office Park,  
Mullingar, Co. Westmeath.

Tel: 044 93 53220/ Mob: 086 6012160/ email: charlotte.johnston@hse.ie

#### **‘Healthy Incentive Scheme (HIP) Project’**

#### **Scored Evaluation Form - Pilot Phase - Information sheet**

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##### **What is the HIP (Healthy Incentive for Pre-schools) Project?**

1. The HIP (Healthy Incentive for Pre-schools) Project is a project that has been set up by the Health Service Executive Dublin Mid-Leinster in association with **safefood**, the Food Safety Promotions Board. The project will run for 4 years and will have a number of phases; the first pilot phase of the project takes place in 2008.

##### **What does the Pilot phase of the HIP Project involve?**

2. As part of the project we are developing a Scored Evaluation Form, that will, by the end of the project, be ready for pre-schools to use as a tool to look at their own service and measure how well they are doing with food and nutrition.
3. The pilot phase of the HIP Project will allow us to try out the Scored Evaluation Form (SEF) in pre-schools. It is important that the Scored Evaluation Form (SEF) is tried out in the pre-school setting, to make sure that all the questions on the SEF are necessary, practical and easy to follow.

##### **What will be involved in this for you as a pre-school?**

4. At least 10 full day care pre-schools in Co. Wicklow will be involved in the pilot phase of the Scored Evaluation Form for the HIP Project. A Community Dietitian will visit each pre-school in the pilot phase and will observe food and nutrition practice and will try out the Scored Evaluation Form in each pre-school to ensure that it is user friendly.
5. In each pre-school, information will be collected about the practicality and ease of using the Scored Evaluation Form, and through the Scored Evaluation Form food and nutrition status will be measured.

##### **How will the information that is gathered be used?**

6. Information from each pre-school visit will be confidential and anonymous and will be added to information from all other pre-school visits to ensure anonymity.
7. A report will be written up on the pilot phase of the HIP Project and information gathered on the development and testing of the SEF may be written up for

publication in scientific journals and or conference presentation. At no time will individual pre-schools be identified in any project report, article or presentation. All written information collected, as part of pre-school visits, will be destroyed once the project is completed.

**Each participant in this pilot project has a right to a copy of the information held, and may obtain a copy by contacting Charlotte Johnston Molloy, Senior Community Dietitian, at the above address. Any participant who is of the opinion that any information held on them is inaccurate, may have a statement changed or may have a statement attached to their record, setting out their version of events, if they so wish.**

## Appendix 6

### Pre-school provider consent form – pre-intervention (phase 3)



#### **‘HIP (Healthy Incentive for Pre-Schools) Project’**

Charlotte Johnston Molloy, Senior Community Dietitian,  
Community Nutrition & Dietetic Service,  
HSE, Marlinstown Office Park, Mullingar, Co. Westmeath.  
Tel: 044 93 53220 / Mob: 086 6012160  
email: charlotte.johnston@hse.ie

#### **‘Healthy Incentive for Pre-Schools (HIP) Project’ Consent form**

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- ◆ I have had the process of the **‘HIP Project’** explained to me and I understand this process.
- ◆ I have had the opportunity to ask questions and discuss the **‘HIP Project’**.
- ◆ I am satisfied with the answers that I have received to all my questions.
- ◆ I understand that during the pre-school visits the Community Dietitian will be:
  - ◆ Observing food, nutrition and associated practice
  - ◆ Filling in the **Scored Evaluation Form**
- ◆ It has been explained to me, and I agree, that the information gathered during this visit will be collated with that from other pre-school visits to ensure anonymity, and that the information collected from the overall project will be written up as a report, and may be submitted for conference presentation, and to scientific journals for publication.
- ◆ I understand that all information gathered during the **‘HIP Project’** will be used to modify and enhance the **‘HIP project’** scheme.
- ◆ I understand that all information gathered will be treated with the utmost confidence by the Dietitian, and that all **Scored Evaluation Forms** will be destroyed on completion of the pilot project. I also understand that all details of the visits will remain anonymous at all times.
- ◆ **I note that I am free to withdraw my consent at any time, without giving a reason, and without affecting any nutrition activities which may be offered to me in the future. I understand and agree to all the above details and I consent to becoming involved in the HIP project.**

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

**Print name:** \_\_\_\_\_

**Position:** \_\_\_\_\_

**Name of Pre-school:**  
\_\_\_\_\_

**Signature of Dietitian:** \_\_\_\_\_

**Date:** \_\_\_\_\_

## Appendix 7

### Pre-school provider information sheet –pre-intervention (phase 3)



#### **‘HIP (Healthy Incentive for Pre-Schools) Project’**

Charlotte Johnston, Senior Community Dietitian,  
Community Nutrition & Dietetic Service,  
HSE, Marlinstown Office Park, Mullingar, Co. Westmeath.  
Tel: 044 93 53220/ Mob: 086 6012160  
email: charlotte.johnston@hse.ie

#### **‘Healthy Incentive for Pre-schools (HIP) Project’**

##### **Information sheet**

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##### **What is the HIP (Healthy Incentive for Pre-schools) Project?**

- The HIP (Healthy Incentive for Pre-schools) Project is a project that has been set up by the Health Service Executive Dublin Mid-Leinster in association with **safefood**, the Food Safety Promotions Board. The project will run for approximately 4 years and will have a number of phases.

##### **What is the aim of the project?**

- The aim of the HIP project is to work with pre-schools, to develop a scheme that will identify and promote good food and nutrition practice, for the health and well being of all infants and children in the full day care pre-school setting.

##### **What are the phases of the HIP project?**

8. A Community Dietitian will visit each pre-school enrolled in the project; will observe all aspects of food, nutrition and associated practice and will fill in the Scored Evaluation Form (SEF) in each pre-school.
9. Pre-schools will receive information on best practice and will be encouraged to look at their own practice and identify areas that may need to be changed.
10. Within 6-9 months of this, a Community Dietitian will revisit your pre-school, and using the SEF will again look at practice. At this stage you, as a pre-school provider will also be asked to self assess your own practice and to feedback to the Community Dietitian. Finally the Pre-school inspection team will also use the SEF as part of their inspection and will feedback to the Community Dietitian.
11. You may also be called upon to give your views on the project process and also on the types of incentives you would be interested in receiving that would make changing practice easier and more attractive to you.

##### **How will the information that is gathered be used?**

- Information from each pre-school visit will be confidential and anonymous and will be added to information from all other pre-school visits to ensure anonymity.
- A report will be written up on each phase of the HIP Project and information gathered may be written up for publication in scientific journals and or conference presentation.

- At no time will individual pre-schools be identified in any project report, article or presentation. All written information collected, as part of pre-school visits, will be destroyed once the project is completed.

**Each participant in this pilot project has a right to a copy of the information held, and may obtain a copy by contacting Charlotte Johnston, Senior Community Dietitian, at the above address. Any participant who is of the opinion that any information held on them is inaccurate, may have a statement changed or may have a statement attached to their record, setting out their version of events, if they so wish.**



## Appendix 8

### Draft Pre-school Characteristic Collection Form (phase 1 pilot)



### HIP (Healthy Incentive for Pre-schools) Pilot Project

CODE:	
Name of Pre-school:	
Name of Pre-school Manager	
Number of carers in pre-school	
Number of children in pre-school	
Number of boys	
Number of girls	
Presence of children under 12 months	
Number of children under 12 months	
No. of children 12 months – 24 months	
No. of children 24-36 months	
No. of children over 36 months	
Full Day Care / Sessional	
If Sessional, what types	
Is food prepared on the premises:	
Is food provided by parents	
Are meals provided by parents	
Breakfast/ lunch / dinner	
Are Snacks provided by parents	
Mid am / mid pm	
Timing of meals and snacks	Breakfast Mid am Lunch / dinner Mid pm Dinner / tea
Any other information	

## Appendix 9

### Draft Pre-school Detailed Assessment Tool (phase 1 pilot)

Draft - Detailed DAT SEF for pilot phase 1 – version 6

Code \_\_\_\_\_

	<b>ENVIRONMENT (All Ages)</b>
1.	<p>Is there evidence of a ‘whole school’ healthy food policy in this pre-school?</p> <ul style="list-style-type: none"><li>• Was it set up in conjunction with the new ‘food &amp; nutrition guidelines’?</li><li>• Is the policy displayed in area that all visitors, parents and staff can see?</li><li>• Is there a list of persons involved in its development listed on the policy?</li><li>• When was the policy set up / is it noted on policy?<ul style="list-style-type: none"><li>• This year</li><li>• Last year</li><li>• 2-4 years ago</li><li>• &gt;5 years ago</li></ul></li><li>• Is the policy part of school rules?</li><li>• Was a team organised to develop the policy?</li></ul>

	<ul style="list-style-type: none"> <li>• Are policy developers named on policy?</li>   <li>• Has the policy got a review date?</li>   <li>• Is the policy divided in sections?</li> </ul>
2.	<p>Is there evidence of a healthy reward scheme in place in the pre-school?</p> <ul style="list-style-type: none"> <li>• What constitutes evidence of healthy reward scheme?</li>   <li>• What evidence is visible of healthy reward scheme?</li>   <li>• Where is it visible?</li>   <li>• Is it only visible in corridors / hallway?</li>   <li>• Is it visible in each room?</li>   <li>• Is it only visible in some rooms?</li>   <li>• Which rooms is it visible in?</li>   <li>• Is it visible in infant room?</li> </ul>

	<ul style="list-style-type: none"> <li>• Is it visible in toddler room?</li> </ul>
3.	<p>Is there evidence of food related education activities in each pre-school room?</p> <ul style="list-style-type: none"> <li>• What constitutes evidence of food related education activities?</li> <li>• What evidence is visible of food related education activities?</li> <li>• Where are food related education activities visible?</li> <li>• Is it only visible in corridors / hallway?</li> <li>• Is it visible in each room?</li> <li>• Is it only visible in some rooms?</li> <li>• Which rooms is it visible in?</li> <li>• Is it visible in infant room?</li> <li>• Is it visible in toddler room?</li> </ul>
4.	<p>Do all children take part in at least one planned physical activity during the day?</p> <ul style="list-style-type: none"> <li>• What constitutes planned physical activity?</li> <li>• Which children take part in planned physical activity?</li> </ul>

	<ul style="list-style-type: none"> <li>• Is it possible to find out when this activity will take place?</li>   <li>• Do all rooms take part?</li>   <li>• Do infant rooms take part</li>   <li>• Do toddler rooms take part?</li> </ul>
5.	<p>Are all infants &amp; children taken outside during the day?</p> <ul style="list-style-type: none"> <li>• Is it possible to see this highlighted anywhere, i.e. in policy?</li>   <li>• Which pre-schoolers are taken outside?</li>   <li>• How long are they taken out for?</li>   <li>• Are they taken out when it is raining?</li> </ul>
6.	<p>Are infants &amp; children praised for eating meals &amp; snacks in each pre-school room?</p> <ul style="list-style-type: none"> <li>• What form does praise take?</li>   <li>• Are children verbally encouraged to eat using a positive form of communication?</li>   <li>• Are all infants and children praised irrespective of ages?</li> </ul>

	<b>WEANING FOODS (6– 12 Months only)</b>
1.	<p>Is consistency of food relevant to all infants' age and development stage?</p> <ul style="list-style-type: none"> <li>• Are different consistencies made up in the kitchen for different ages?</li> <li>• Are different consistencies given to different ages?</li> </ul>
2.	<p>Are weaning foods appropriate to age of development?</p> <ul style="list-style-type: none"> <li>• What types of food are being given to infants?</li> <li>• Are different foods being given to different age groups</li> <li>• Is gluten being introduced by 7 months?</li> </ul>
3.	<p>Are infants encouraged to feed themselves at the appropriate age?</p> <ul style="list-style-type: none"> <li>• At what age are children being encouraged to feed themselves?</li> <li>• Are different ages of infants being treated differently with regard to food &amp; snacks?</li> <li>• Are older infants 9-12 months being given hand held finger foods?</li> </ul>
4.	<p>Are iron rich weaning foods being given to all infants?</p> <ul style="list-style-type: none"> <li>• Are all infants being given meat as part of main meal?</li> </ul>

	<ul style="list-style-type: none"> <li>• If not what are they being given and why?</li> <li>•</li> </ul>
5.	<p>Are formula / breast milk and cooled boiled water, the only drinks offered?</p> <ul style="list-style-type: none"> <li>• What drinks are being offered?</li> <li>• Is water cooled, boiled tap water?</li> <li>• Is squash being offered?</li> <li>• Is juice being offered?</li> <li>• If offered, is juice being watered down?</li> </ul>
6.	<p>Are infants given fluid from a two handled unlidded beaker / cup?</p> <ul style="list-style-type: none"> <li>• Are all infants being given bottles no matter what their age?</li> <li>• Is there evidence that beakers / cups are being introduced?</li> <li>• If they are being introduced, at what age is this happening?</li> <li>• Are beakers / cups two handled?</li> <li>• Are beakers / cups lidless?</li> </ul>

	<ul style="list-style-type: none"> <li>• If beakers / cups are lidded, are the lids spill proof?</li> </ul>
--	---

	<p><b>MEALS: WEANED CHILDREN (over 12 months)</b></p>
1.	<p>Do providers sit down at the table with the children?</p> <ul style="list-style-type: none"> <li>• Do caregivers sit with children when they are eating?</li> <li>• How many caregivers are sitting with children?</li> <li>• Do some providers sit down with children while others give out food?</li> <li>• Do children wait to start food until all have been served?</li> <li>• Do providers eat with children?</li> <li>• If they eat, do they eat what the children are being given?</li> <li>•</li> </ul>
2.	<p>Is help given to children if they are having difficulty eating?</p> <ul style="list-style-type: none"> <li>• Do caregivers help children to eat if they are having difficulty in handling cutlery?</li> <li>• Do providers sit down beside the child to give help or stand over the child?</li> <li>• Do providers chop food up for children if necessary?</li> </ul>



3.	<p>* *</p> <p>Is portion of protein food appropriate at main meal?</p> <ul style="list-style-type: none"> <li>• Compared to food atlas is it too small?</li> <li>• Compared to food atlas is it too big?</li> <li>• Is it difficult to determine portion as it is a composite dish?</li> <li>• Are seconds given when promoted?</li> <li>• Are seconds offered?</li> </ul>
4.	<p>* *</p> <p>Is portion of starchy food appropriate at main meal?</p> <ul style="list-style-type: none"> <li>• Compared to food atlas is it too small?</li> <li>• Compared to food atlas is it too big?</li> <li>• Is it difficult to determine portion as it is a composite dish?</li> <li>• Are seconds given when promoted?</li> <li>• Are seconds offered?</li> </ul>
5.	<p>* *</p> <p>Is portion of dairy food appropriate at main meal?</p> <ul style="list-style-type: none"> <li>• Compared to food atlas is it too small?</li> </ul>

	<ul style="list-style-type: none"> <li>• Compared to food atlas is it too big?</li> <li>• Is it difficult to determine portion as it is a composite dish?</li> <li>• Are seconds given when promoted?</li> <li>• Are seconds offered?</li> </ul>
6. *	<p>* Is portion of vegetables appropriate at main meal?</p> <ul style="list-style-type: none"> <li>• Compared to food atlas is it too small?</li> <li>• Compared to food atlas is it too big?</li> <li>• Is it difficult to determine portion as it is a composite dish?</li> <li>• Are seconds given when promoted?</li> <li>• Are seconds offered?</li> </ul>

	<p><b>SNACKS: WEANED CHILDREN (over 12 months):</b></p>
1.	<p>Is fruit offered as a snack to all infants and children?</p> <ul style="list-style-type: none"> <li>• What way is fruit served?</li> </ul>

	<ul style="list-style-type: none"> <li>• In individual bowls; from one bowl or platter etc?</li> <li>• How is fruit prepared?</li> <li>• Is fruit chopped, blended, in the piece, segmented etc?</li> <li>• Does preparation vary depending on age of children?</li> <li>• Do all children and infants get fruit?</li> </ul>
2.	<p>Is tap water offered with meals &amp; snacks in each pre-school room?</p> <ul style="list-style-type: none"> <li>• How is water offered?</li> <li>• is it poured out into glasses for each child?</li> <li>• Is it left in jug in view and has to be asked for?</li> <li>• Is it given to children with food or after food?</li> <li>• Is it tap water or bottled water?</li> </ul>
3.	<p>Is tap water offered between meals &amp; snacks in each pre-school room?</p> <ul style="list-style-type: none"> <li>• Is there a jug or water visible in each pre-school room?</li> </ul>

	<ul style="list-style-type: none"> <li>• Are children offered water from jug during the day?</li>   <li>• How is water offered?</li>   <li>• Do children have to ask for water?</li> </ul>
4.	<p>Is milk offered to children at least once during pre-school day?</p> <ul style="list-style-type: none"> <li>• Is milk offered with meals?</li>   <li>• Is milk offered with a snack?</li>   <li>• Is milk offered by itself during day?</li> </ul>
5.	<p>Is tap water and milk the only drinks offered during the day?</p> <ul style="list-style-type: none"> <li>• Is bottled water offered?</li>   <li>• Is juice offered?</li>   <li>• Is squash offered?</li>   <li>• What other drinks are in evidence?</li> </ul>
6.	<p>Are offered snacks low in fat and low in sugar?</p> <ul style="list-style-type: none"> <li>• What types of snacks are being given?</li> </ul>

	<ul style="list-style-type: none"><li>• Are snacks naturally low in fat?</li><li>• Are snacks naturally low in sugar?</li><li>• Are snacks being eaten by children?</li></ul>
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\* - see food photo guide

## Appendix 10

### Draft Pre-school Health Promotion Activity Scored Evaluation Form (phase 1 pilot)

Draft 4 SEF - Version 6		Code		
	ENVIRONMENT (All Ages)	Not minimum std (0)	Minimum Std (1)	Best practice (3)
1.	Is there <i>evidence</i> of a ‘whole school’ healthy food policy in this pre-school?			
2.	Is there evidence of a healthy reward scheme in place in the pre-school?			
3.	Is there evidence of food related education activities in each pre-school room?			
4.	Do all children take part in at least one planned physical activity during the day?			
5.	Are all infants & children taken outside during the day? ?? <i>seasonal</i>			
6.	Are infants & children praised for eating meals & snacks in each pre-school room?			
	<b><u>Total</u></b>		/6	/24
				/30
	WEANING FOODS (6– 12 Months only)	Does not meet minimum std (0)	Minimum Std (1)	Best practice (3)
1.	Is consistency of food relevant to all infants’ age and development stage?			
2.	Are weaning foods appropriate to age of development?			
3.	Are infants encouraged to feed themselves at the appropriate age?			
4.	Are iron rich weaning foods being given to all infants?			
5.	Are formula / breast milk and cooled boiled water, the only			

	drinks offered?			
6.	Are infants given fluid from a two handled unlidded beaker / cup?			
	<b>Total</b>		/6	/24

/30

	<b>MEALS: WEANED CHILDREN (over 12 months)</b>	<b>Does not meet minimum std (0)</b>	<b>Minimum Std (1)</b>	<b>Best practice (3)</b>
1.	Do providers sit down at the table with the children?			
2.	Is help given to children if they are having difficulty eating?			
3. *	* Is portion of protein food appropriate at main meal?			
4. *	* Is portion of starchy food appropriate at main meal?			
5. *	* Is portion of dairy food appropriate at main meal?			
6. *	* Is portion of vegetables appropriate at main meal?			
	<b>Total</b>		/6	/24

/30

	<b>SNACKS: WEANED CHILDREN (over 12 months)</b>	<b>Does not meet minimum std (0)</b>	<b>Minimum Std (1)</b>	<b>Best practice (3)</b>
1.	Is fruit offered as a snack to all infants and children?			
2.	Is tap water offered with meals & snacks in each pre-school room?			
3.	Is tap water offered between meals & snacks in each pre-school room?			
4.	Is milk offered to children at least once during pre-school day?			
5.	Are tap water and milk the only drinks			

	offered during the day?			
6.	Are offered snacks low in fat and low in sugar?			
	<b><u>Total</u></b>		<b>/6</b>	<b>/24</b>
				<b>/30</b>
	<b><u>GRAND TOTAL</u></b>			<b>/120</b>

\* - see food photo guide

**Award Categories:**

**6 months – school age: Total 120**

<b>Participation</b>	0-24
<b>Bronze</b>	25-49
<b>Silver</b>	50-74
<b>Gold</b>	75-99
<b>Platinum</b>	100-120

**12 months – school age: Total 90**

<b>Participation</b>	0-18
<b>Bronze</b>	19-37
<b>Silver</b>	38-56
<b>Gold</b>	57-75
<b>Platinum</b>	76-90



## Appendix 11

### Pre-school Characteristic Collection Form – pre-intervention (phase 3) and post-intervention (phase 7)

#### HIP (Healthy Incentive for Pre-schools) Project

<b>Pre-school information:</b>		
CODE:		
Day of the week:		
Time of visit:	In:	
	Lunch:	
	Out:	
Name of Pre-school:		
Name of Pre-school Manager		
Private or community		
Number of carers in pre-school		
	Full time	
	Part time	
Community Employment staff	Yes	No
Total Number of children in pre-school		
Total number of FDC children (>5 hrs)		
Part time / sessional (<5 hrs)		
Minimum age that child enters pre-school		
Presence of children under 12 months	Yes	No
No. children <12 Months	Total	FDC only
No. children 12 M - 24 M	Total	FDC only
No. children 24M-36M	Total	FDC only
No. of children > 36 M	Total	FDC only
Full Day Care	Yes	No
Sessional	Yes	No
If Sessional, what types	Whole morning 2 hours in morning afternoon	

	after-schools	
<b>Food</b>		
Is food prepared on the premises:	Yes	No
Is food provided by parents	Yes	No
Are meals provided by parents	Yes	No
	Breakfast Lunch Dinner	
Are Snacks provided by parents	Yes	No
	Mid am Mid pm	
Timing of meals and snacks	Breakfast Mid am Lunch / dinner Mid pm Dinner / tea	
Breakfast ; what is given		
Would sugar coated / chocolate cereal be given?	Yes	No      Don't know
	How often	
How often would processed food e.g. sausages, fish fingers, chicken nuggets be given	Never Once a month Once a fortnight Once a week Twice a week 3 times a week > 3 times a week	
Is pre-school manager involved in cooking the pre-school	Yes	no
Is there a dedicated chef for all meals	Yes	no
Is the dedicated chef in place to make main meal only	Yes	no
Is sugar added when food is being	Yes	no

prepared	
Is salt added in food preparation	Yes no
Is packet soup, stock cubes or packet sauces used	Packet soup Stock cubes Packet sauces Gravy other
Any children on special diets	Yes no
Types of special diets in practice	Vegetarian Ethnic Allergies Metabolic other
What is done to cater for these children	
<b>Funding:</b>	
Cost of FDC childcare per week €	<12 M 12-24M 24-36M >36M
Cost of sessional childcare per week €	<12 M 12-24M 24-36M >36M afterschools
Cost of FDC childcare per day €	<12 M 12-24M 24-36M >36M
Cost of sessional childcare per day €	<12 M 12-24M

	24-36M >36M After-schools
Cost of food provision each week €	Total FDC only
Cost of catering company food / week €	
Funding from schools meal scheme	Yes No Don't know
School milk scheme	Yes No Don't know
Opening times of pre-school	
<b>Training and resources:</b>	
Resources used in pre-school	
Staff attended healthy eating pre-school training	Yes No Don't know
Copy of Food & Nutrition Guidelines	Yes No Don't know
If yes, where is it kept	
Are other staff aware of guidelines	Yes No Don't know
'3 week menu resource' on premises	Yes No Don't know
If yes, where is it kept?	
How would you suggest to engage parents regarding health and their children	
<b>Policy</b>	
Written healthy eating policy	Yes No Don't know
If yes, how long has it been in place	
Who was involved in developing policy	
Were parents involved	Yes No Don't know

If yes, how were they involved	
Is any information given to parents on policy	
If yes, how is information given	
Are all staff aware of policy	Yes          No          Don't know
Is there a policy on snacks	
If yes, what is it	
Specific policy on celebration days?	
<b>Children under 12 months: Breastfeeding</b>	
Do you have a policy on breastfeeding	
Do you get information from formula milk companies	Yes          No          Don't know
If yes, is it displayed for parents	
Feeding of babies	Demand fed: Pre-school schedule
Is amount of milk babies consume recorded	Yes          No          Don't know
If yes, is it recorded in mls (oz) or bottles	Bottles          mls          ounces
Do children < 1 receive other liquid in bottles	Yes          No          Don't know
If yes, what do they get	
Do children drink bottles in bed	
<b>Introduction of solid foods</b>	
At what age are solids encouraged to be introduced	

Does this differ for bottle / breastfed babies	Yes	No	Don't know
Which first foods offered / provided by parents	Cereals pureed potato Pureed meat Beans / peas Pureed fruit Pureed veg Commercial baby food Other		
Are children <1 given cow's milk	Yes	No	Don't know
Are gluten containing cereals given < 6M	Yes	No	Don't know
What type of milk used in prep of food			
Age of cup introduction			
Bottles over 12 months			
Separate menu for <1 year			
<b>Children 1-5 years</b>			
One person responsible for food and nutrition issues?			
Who is that?			
Written menu for >1 year			
How many weeks in length is menu cycle	1 wk 2 wk 3 wk 4 wk other		
Who's involved in menu formation			
Parents got input into menu formation	Yes	No	Don't know
Are menus displayed for parents to see	Yes	No	Don't know
Are parents informed daily of foods eaten			
If yes, how is this done			

Issues with food provision:	
Food policy formation Menu planning Feeding <1 year 1-5yrs parental concerns other	
Concerns that children refuse healthy food	Yes                  No                  Don't know
Healthy food provision difficult in pre-school	Yes                  No                  Don't know
Main barriers	

## Appendix 12

### Pre-school Detailed Assessment Tool – pre-intervention (phase 3) and post-intervention (phase 7)

SEF Detailed Assessment Tool Code \_\_\_\_\_

How many meals and snack are there every day; and what time do these take place?	
1.	<p><b>Infants: &lt; 12 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p><b>Toddlers: 12M – 24 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p><b>Waddlers: 24M-36M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p>



	<p>PM snack:</p> <p><b>Pre-schoolers: &gt; 36 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p><b>Other:</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p>
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	<b>ENVIRONMENT</b>	
<b>Is there <i>evidence</i> of a written ‘whole pre-school service’ healthy policy in this pre-school?</b>		
1.	Is there a policy visible anywhere?	Yes / No
2.	If yes; where is it visible?	
3.	Does it contain information on:	Food and nutrition

		Physical activity  Dental health  Confidence / good mental health
4.	Is it looking at the whole school environment?	
5.	Are names of those involved in production visible on the policy?	
6.	Were parents and staff involved in the production of policy?	
7.	Is it clear when the policy was written?	
	Is there a date for annual review	
<b>Is there evidence of food related education materials in each pre-school room?</b>		
1.	Is evidence visible in each pre-school room Yes / No	
2.	If no: what rooms do not contain food related education materials?	
3.	If observed; what constitutes food related education materials and which rooms are they found in	

4.	Are food related education materials visible in hallways and corridors? Yes / No	
5.	If visible in hallways and corridors; of what do they consist?	
<b>Do children of all ages take part in at least one planned physical activity during the day?</b>		
1.	Is it possible to observe a physical activity timetable easily in the corridors / hallway of the pre-school?	Yes / No
2.	Possible to observe <b>all infants and children</b> taking part in at least one planned physical activity session during the day?	Yes / No
3.	Which children / infants are seen to participate?  Infants: < 12 M  Toddlers: 12M – 24 M  Waddlers: 24M-36M  Pre-schoolers: > 36 M  Other:	
4.	How long does the physical activity session last for each group:  Infants: < 12 M AM:  PM:	

	<p>Toddlers: 12M – 24 M AM:  PM:</p> <p>Waddlers: 24M-36M AM:  PM:</p> <p>Pre-schoolers: &gt; 36 M AM:  PM:</p> <p>Other: AM:  PM</p>	
5.	Is seamless physical activity visible and if so of what does this consist?	Yes/ no
6.	What type of play equipment is visible?	
<b>Is there evidence that all infants &amp; children are taken outside during the day, regardless of weather?</b>		
1.	Was it possible to observe infants and children being brought outside in inclement weather?	Yes / No
2.	What conditions were there on the day of the visit?	
3.	<p>Which children / infants were seen to be taken outside?</p> <p>Infants: &lt; 12 M AM:  PM:</p> <p>Toddlers: 12M – 24 M AM:</p>	

	<p>PM:</p> <p>Waddlers: 24M-36M AM:</p> <p>PM:</p> <p>Pre-schoolers: &gt; 36 M AM:</p> <p>PM:</p> <p>Other: AM:</p> <p>PM</p>	
4.	Were children's coats, hats and wellie boots in evidence	Yes / No
5.	Was the play equipment outside such that it would allow for outdoor play in the rain	Yes / No
6.	If yes, describe which play equipment would be conducive to outdoor play	
7.	If children were taken outside; for how long were they taken outside?	<p>Infants: &lt; 12 M AM:</p> <p>PM:</p> <p>Toddlers: 12M – 24 M AM:</p> <p>PM:</p> <p>Waddlers: 24M-36M AM:</p> <p>PM:</p> <p>Pre-schoolers: &gt; 36 M AM:</p>

		PM:  Other: AM:  PM
<b>Is there evidence that food is used as a reward or treat?</b>		
1.	Outline evidence that food is being used as a treat or reward?  <b>Infants: &lt; 12 M</b>  Breakfast  AM snack:  Main meal  PM snack:  <b>Toddlers: 12M – 24 M</b>  Breakfast  AM snack:  Main meal  PM snack:  <b>Waddlers: 24M-36M</b>  Breakfast  AM snack:	

	<p>Main meal</p> <p>PM snack:</p> <p><b>Pre-schoolers: &gt; 36 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p><b>Other:</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p>
2.	<p>Was there any evidence of healthy reward schemes in place</p> <p>Yes / No</p> <p>Outline evidence of healthy reward scheme</p>

3.	<p>Are there stickers and posters encouraging hand washing visible in all rooms Yes / No</p> <p>If visible outline what is seen</p>
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	<b>FOOD SERVICE</b>
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**Does at least one provider sit at each table with the children when the children are eating, or sit beside infants in highchairs when they are eating?**

1.	<p><b>Infants: &lt; 12 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Toddlers: 12M – 24 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p>
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	<p><b>Waddlers: 24M-36M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Pre-schoolers: &gt; 36 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p>
2.	<p>Are there appropriate seats for providers so to enable them to sit with children / infants</p> <p>Yes / no</p> <p>Explain:</p>

<b>Does at least one provider eat the same food as the children, with the children, each time that children, irrespective of age, are eating?</b>	
1.	<p><b>Infants: &lt; 12 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Toddlers: 12M – 24 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Waddlers: 24M-36M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p>

	<p>PM snack:</p> <p>Light meal</p> <p><b>Pre-schoolers: &gt; 36 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p>
<p><b>Is 'family style food service' practiced in the pre-school?</b></p>	
<p>1.</p>	<p>Are all providers assigned to each room there and available to help at all meal and snack times</p> <p><b>Infants: &lt; 12 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p>

**Toddlers: 12M – 24 M**

Breakfast

AM snack:

Main meal

PM snack:

Light meal

**Waddlers: 24M-36M**

Breakfast

AM snack:

Main meal

PM snack:

Light meal

**Pre-schoolers: > 36 M**

Breakfast

AM snack:

Main meal

PM snack:

	Light meal
2.	Is the food being eaten: Yes / no
3.	Food & nutrition discussed at meal times:
4.	Are stories told at meal times Yes / no
5.	In older age groups, do all children wait to eat until all have plates of food? Yes / no
6.	In older age groups, are children allowed to leave the table before all children are finished eating Yes / no
7.	Are meals and snacks relaxed events Yes / no
8.	Does cleaning of dishes begin before all children are finished eating Yes / no
9.	Do children participate in meal; laying cutlery; serving; cleaning up etc Yes / no
10.	Other:

**Is adequate time allocated to feeding times?**

1.

**Infants: < 12 M**

Breakfast

AM snack:

Main meal

PM snack:

Light meal

**Toddlers: 12M – 24 M**

Breakfast

AM snack:

Main meal

PM snack:

Light meal

**Waddlers: 24M-36M**

Breakfast

AM snack:

Main meal

PM snack:

	<p>Light meal</p> <p><b>Pre-schoolers: &gt; 36 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p>
2.	<p><b>Are children allowed to eat at their own pace or are they told to hurry and helped to eat to speed up the process</b></p> <p><b>Infants: &lt; 12 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Toddlers: 12M – 24 M</b></p> <p>Breakfast</p>

	<p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Waddlers: 24M-36M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Pre-schoolers: &gt; 36 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p>
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Are all children, irrespective of age, actively encouraged to feed themselves?

1.

**Infants: < 12 M**

Breakfast

AM snack:

Main meal

PM snack:

Light meal

**Toddlers: 12M – 24 M**

Breakfast

AM snack:

Main meal

PM snack:

Light meal

**Waddlers: 24M-36M**

Breakfast

AM snack:

Main meal

PM snack:

	<p>Light meal</p> <p><b>Pre-schoolers: &gt; 36 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p>
<p><b>Are age appropriate feeding and drinking utensils available for all ages of children and infants?</b></p>	
<p>1.</p>	<p><b>Infants: &lt; 12 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Toddlers: 12M – 24 M</b></p> <p>Breakfast</p> <p>AM snack:</p>

	<p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Waddlers: 24M-36M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p> <p><b>Pre-schoolers: &gt; 36 M</b></p> <p>Breakfast</p> <p>AM snack:</p> <p>Main meal</p> <p>PM snack:</p> <p>Light meal</p>
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<b>MEALS</b>		
<b>Is appropriate portion of protein food available at main meal?</b>		
1.	Was the dish a composite	Yes / no

	dish	Explain:
2.	Was it possible to easily determine the protein portion?	Yes / no Explain:
3.	Was it possible to see the food being plated up?	Yes / no Explain:
4.	Was the portion of protein	None:  Too large:  Too small  Just right:
<b>Is appropriate portion of starchy food available at main meal?</b>		
1.	Was the dish a composite dish	Yes / no Explain:
2.	Was it possible to easily determine the portion of starchy food?	Yes / no Explain:
3.	Was it possible to see the food being plated up?	Yes / no Explain:

4.	Was the portion of starch:	None:  Too large:  Too small  Just right:
<b>Is appropriate portion of dairy food available at main meal?</b>		
1.	Was the dish a composite dish	Yes / no  Explain:
2.	Was it possible to easily determine the dairy portion of the meal food?	Yes / no  Explain:
3.	Was it possible to see the food being plated up?	Yes / no  Explain:
4.	Was the portion of dairy:	None:  Too large:  Too small  Just right:
<b>Is appropriate portion of vegetables available at main meal?</b>		

1.	Was the dish a composite dish	Yes / no  Explain:
2.	Was it possible to easily determine the vegetable portion of the meal food?	Yes / no  Explain:
3.	Was it possible to see the food being plated up?	Yes / no  Explain:
4.	Was the portion of vegetables	None:  Too large:  Too small  Just right:
<b>Are meals offered in a self-service style to all children?</b>		
1.	Are all meals plated up and delivered to tables on plates / in bowls	Yes / no  Explain:
2.	During snack time; how is food delivered to children	Explain:
3.	Are plates and bowls always given to children for all meals and snacks	Yes / no meals:  Yes / no snacks:

		Explain:
4.	Do any pre-school rooms provide serving bowls with food in them from which pre-school children can then help themselves ?	Yes / no  Explain
5.	Are children offered seconds	Yes / no meals:  Yes / no snacks:  Explain:
<b>Is an iron rich food given to all children as part of the main meal?</b>		
1.	Is an iron rich food apparent in the main meal of the day?	Yes / no  Explain
2.	Do all children receive iron rich food	Yes / no  Explain
3.	What type of iron rich food is being used	Explain:

## SNACKS

**Is an appropriate portion of fruit offered as a snack to children of all ages?**

1.	Is fruit offered as a snack	Yes / no
2.	If offered ; is it offered on its own as a snack	Yes / no
3.	Is it offered on it's own as a snack am & pm	Yes / no
4.	When offered; how is it offered?	From a platter / bowl passed around and asked to take on piece at a time  Individual bowls;  Bowl / platter in centre of table  Other
5.	Is portion adequate; if not allowed to serve selves ad lib	Yes / no  Explain
6.	Is serving of fruit appropriate for age of infant / child	Yes / no  Explain
Are snacks being offered from top shelf of the Food Pyramid?		
1.	Give examples of snacks being offered	Yes / no  Explain



2.	Are snacks offered from parents	Yes / no  Explain
3.	Are snacks from top shelf of Food Pyramid	Yes / no  Explain
<b>Is an appropriate portion of dairy food offered to each child, on at least one occasion, other than main meal?</b>		
1.	Is dairy offered to every child at least once per day – apart from main meal	Yes / no  Explain
2.	When is dairy food offered	Explain
3.	Is the dairy food portion offered adequate	Too small:  Too large:
4.	Are seconds offered:	Yes / no  Explain
<b>Are tap water and milk the only drinks offered with snacks during the pre-school day?</b>		
1.	Are tap water and milk the only drinks offered with snacks during the day?	Yes / no

		Explain
2.	If not; what other drinks are being offered	Explain:  Bottled water:  Squash  Juice  Flavoured milks  Fizzy drinks  Others
3.	Is it difficult to determine what drinks are being offered; i.e. ready made up jugs of squash / juice; parental sports' flasks etc	Yes / no  Explain
<b>Are tap water, milk or appropriately diluted juice the only drinks offered with meals during the pre-school day?</b>		
1.	Are tap water, milk or appropriately diluted juice the only drinks offered with meals during the pre-school day?	Yes / no  Explain
2.	If no, what other drinks are being offered	Explain:  Bottled water:  Squash

		<p>Juice</p> <p>Flavoured milks</p> <p>Fizzy drinks</p> <p>Others</p>
3.	Is it difficult to determine what drinks are being offered; i.e. ready made up jugs of squash / juice; parental sports' flasks etc	<p>Yes / no</p> <p>Explain</p>
4.	Is it difficult to whether a fluid is squash; juice; diluted juice etc	<p>Yes / no</p> <p>Explain</p>
<b>Is tap water or milk offered to all children, between meals &amp; snacks, in each pre-school room?</b>		
1.	Is tap water or milk offered to all children, between meals & snacks, in each pre-school room?	<p>Yes / no</p> <p>Explain</p>
2.	Is it difficult to determine what drinks are being offered; i.e. ready made up jugs of squash / juice; parental sports' flasks etc	<p>Yes / no</p> <p>Explain</p>
3.	Are there signs / posters / stickers in each pre-school room encouraging providers to offer water / milk between meals and	<p>Yes / no</p> <p>Explain</p>

	snacks	
4.	Is there a visible jug / bottle of water at a water station in each pre-school room	Yes / no  Explain
5. is it	Is it difficult to determine if water is tap or bottled water?	Yes / no  Explain

**Notes:**

## Appendix 13

### Pre-school Health Promotion Activity Scored Evaluation Form – pre-intervention (phase 3) and post-intervention (phase 7)

*The Pre-school Health Promotion Activity Scored Evaluation Form:*

*SEF (phase 3 &7) HIP Project*

Service code: \_\_\_\_\_ Date of SEF completion: \_\_\_\_\_

	<b>Environment</b>	<b>Not minimum std (0)</b>	<b>Minimum Std (1)</b>	<b>Best practice (3)</b>
1.	Is there visible <i>evidence</i> of a written 'whole pre-school service' healthy policy in this service?			
2.	Is there evidence of food related education materials in each service room?			
3.	Do children of all ages take part in the recommended amount of age appropriate physical activity during the day?			
4.	Is there evidence that all infants & children are taken outside during the day, regardless of weather?			
5.	Is there evidence that food is used as a reward or treat?			
6.	Are at least two meals and two snacks provided to all full day care children in the service			
	<b>Total</b>		<b>/6</b>	<b>/18</b>
				<b>/18</b>
	<b>Food service</b>	<b>Not minimum std (0)</b>	<b>Minimum Std (1)</b>	<b>Best practice (3)</b>
1.	Does at least one provider sit at each table with the children when the children are eating, or sit beside infants in highchairs when they are eating?			
2.	Does at least one provider eat the same food as the children, with the children, each time that children, irrespective of age, are eating?			
3.	Is 'family style food service' practiced in the service?			
4.	Is adequate time allocated to feeding			

	times?			
5.	Are all children, irrespective of age, actively encouraged to feed themselves?			
6.	Are age appropriate feeding and drinking utensils available for all ages of children and infants?			
	<b>Total</b>		/6	/18

**\*\*\*the developmental milestones in this SEF would not apply to children with special needs**

	<b>Meals</b>	<b>Does not meet minimum std (0)</b>	<b>Minimum Std (1)</b>	<b>Best practice (3)</b>
1. *	* Is appropriate serving of protein food available at main meal?			
2. *	* Is appropriate serving of starchy food available at main meal?			
3. *	* Is appropriate serving of dairy food available at main meal?			
4. *	* Is appropriate serving of vegetables available at main meal?			
5.	Are meals offered in a self-service style to all children?			
6.	Is an iron rich food given to all children as part of the main meal?			
	<b>Total</b>		/6	/18

/18

	<b>Snacks</b>	<b>Not minimum std (0)</b>	<b>Minimum Std (1)</b>	<b>Best practice (3)</b>
1.	Is an appropriate serving of fruit offered to children of all ages on at least one occasion, other than the main meal?			
2.	Are foods being offered from top shelf of the Food Pyramid?			
3.	Is an appropriate serving of dairy food offered to each child, on at least one occasion, other than main meal?			
4.	Are tap water and milk the only drinks			

	offered <b>with snacks</b> during the pre-school day?			
5.	Are tap water, milk or appropriately diluted juice the only drinks offered <b>with meals</b> during the pre-school day?			
6.	Is tap water or milk offered to all children, <b>between meals &amp; snacks</b> , in each pre-school room?			
	<b>Total</b>		<b>/6</b>	<b>/18</b>
				<b>/18</b>
	<b>Grand Total</b>			<b>/72</b>

\* - see food weight and measure reference guide

### **Award Categories:**

**Total: 72**

<b>Participation</b>	0-19
<b>Bronze</b>	20-39
<b>Silver</b>	40-54
<b>Gold</b>	55-64
<b>Platinum</b>	65-72

## Appendix 14

### Abstract for the oral communication presented at the Proceedings of 3<sup>rd</sup> International Consumer Sciences Research Conference.

Healthy Incentive for Pre-schools project preparatory study A.

Johnston C, Guiden H, Corish C, Kearney J & Glennon C (2007) An exploration of the feasibility of a healthy food incentive scheme in the pre-school setting. *3rd International Consumer Sciences Research Conference: Improving Consumer Skills – Improving Consumer Choice*. Jordanstown, Belfast.

Pre-school providers play a valuable role in the lives of young children as the food offered at a young age can affect nutritional status, food habits and future health (Lozoff *et al.* 2000; Ebbeling *et al.* 2002). In Ireland, Food & Nutrition Guidelines for pre-schools exist (DoHC, 2004) but, as these are not mandatory, methods to encourage the provision of nutritious food in this setting must be pursued. The introduction of a 'healthy food incentive scheme' may make the provision of such food a more attractive choice for the providers.

The purpose of this study was to explore the feasibility of a healthy food incentive scheme in the Midlands of Ireland. A structured telephone questionnaire was used to obtain the views of both the pre-school nutrition team (*n* 9) and pre-school providers (*n* 17) on such a scheme. The pre-school nutrition team (including environmental health officers, public health nurses, training officer, child minding advisory officer and pre-school services manager) oversees nutrition interventions in the pre-school setting; the pre-school providers are predominantly the care assistants directly involved with the daily care of the children.

All nine members of the pre-school nutrition team favoured the introduction of an incentive scheme, suggesting that it would facilitate nutrition education and act as an incentive for the implementation of healthy food policies in pre-schools. Conferral of certification and media coverage in an annual event was proposed as the best way to encourage participation by the pre-school providers. Perceived barriers to implementation of an incentive scheme included lack of funding, poor participation and motivation, lack of education, lack of staff support and difficulties monitoring practice in the pre-schools. All the pre-school providers interviewed supported the introduction of an incentive scheme but identified lack of time and poor understanding of healthy eating for children as the main barriers to implementing healthy eating policies. A perceived lack of parental support was also highlighted as a further barrier to the implementation of healthy eating. Specific needs identified by the pre-school providers to enable participation in a healthy eating incentive scheme included regular training of staff and parents on nutrition and the provision of expertise to develop and implement healthy food policies.

Although all respondents support a healthy food incentive scheme in principle, the barriers to implementation of healthy eating and participation in an incentive scheme must be acknowledged. The support mechanisms identified by the pre-school providers to ensure participation in such a scheme need to be provided and the effect of the scheme evaluated.

Department of Health and Children (2004) *Food and Nutrition Guidelines for Pre-School Services*. Dublin: DoHC.

Ebbeling CB, Pawlak DB & Ludwig DS (2002) *Lancet* **360**, 473-82.

Lozoff B, Jimenez E, Hagen J, Mollen E, & Wolf, AW (2000) *Paediatrics* **105**, e51.



## Appendix 15

### Abstract published in the Proceedings of the Nutrition Society.

#### Healthy Incentive for Pre-schools project preparatory study B.

Johnston Molloy C, Murtagh M, Corish CA, Kearney J & Glennon C (2007) An exploration of food provision, and commitment to the introduction of a nutrition incentive scheme, in the pre-school setting. *Proc Nutr Soc* **66**, 109A.

**An exploration of food provision, and commitment to the introduction of a nutrition incentive scheme, in the preschool setting.** By C. JOHNSTON MOLLOY<sup>1</sup>, M. MURTAGH<sup>1</sup>, C. CORISH<sup>2</sup>, J. KEARNEY<sup>2</sup> and C. GLENNON<sup>1</sup>, <sup>1</sup>Community Nutrition & Dietetic Service, Health Service Executive Dublin Mid-Leinster, Marlinstown Office Park, Mullingar, Co. Westmeath, Republic of Ireland and <sup>2</sup>Department of Biological Sciences, Dublin Institute of Technology, Kevin Street, Dublin 8, Republic of Ireland

Preschools play a valuable role in the lives of young children, as food offered can affect nutritional status, food habits and future health<sup>1,2</sup>. In Ireland food and nutrition guidelines for preschool services<sup>3</sup> exist, but methods to encourage provision of nutritious food in this setting are lacking and must be pursued to ensure guidelines are followed. A preliminary study has demonstrated that preschools are in favour of introducing the model of a nutrition incentive scheme<sup>4</sup>. The purpose of the present study was to obtain baseline data on the meal and snack categories being provided by preschools and parents, and to determine preschool commitment to enrolling in a future nutrition incentive scheme. A structured telephone questionnaire was used to obtain the views of preschool providers based in the Midlands region of Ireland, who are those directly involved with the daily care of the children in their establishment (*n* 89).

Seventy-three of eighty-nine preschools registered with the Health Service Executive (HSE) took part in the investigation. Sixty-seven preschools reported that they provided food: breakfast (*n* 37); mid-morning snack (*n* 47); main meal (*n* 65); mid-afternoon snack (*n* 46); light meal (*n* 23). Forty-eight preschools stated that parents provide some food: breakfast (*n* 3); mid-morning snack (*n* 45); main meal (*n* 3); mid-afternoon snack (*n* 19); light meal (*n* 1). Whilst sixty-three noted that they had a healthy food policy, only forty-two said they had created it in conjunction with the Food and Nutrition Guidelines for Preschool Services<sup>3</sup> and only forty-three had a policy on food brought in by parents.

When asked to rate the idea of a nutrition incentive scheme on a Likert scale (1, poor; 10, excellent), the majority of participants gave scores of 8–10. Most preschool providers (*n* 64) said that they would sign up for a nutrition incentive scheme and cited many benefits. The Table shows benefits suggested by the preschool providers.

Benefits cited	<i>n</i>
Provide training for members	19
Facilitate children to eat more healthily	16
Information for parents	8
Raise profile amongst parents	7
Improve practice	6
Deliver more information on healthy food	6
Improve menus	5
Obtain recognition from HSE	3

Although the majority of preschools are committed to taking part in a nutrition incentive scheme, the present study demonstrates that in many services parents are providing quite a substantial amount of the food being eaten by children. It is necessary to ensure that a parental perspective is included in the planning and establishment of a future nutrition incentive scheme.

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## Appendix 16

### Abstract published in the Journal of Human Nutrition and Dietetics.

#### Healthy Incentive for Pre-schools project preparatory study C.

Molloy CJ, De Siún A, Kennelly S & Slattery CG (2007) A study to determine the view of Irish pre-schools, on the use of a scored evaluation form as a motivational tool, to improve food provision in this setting. *J Hum Nutr Diet* 20, 382.

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produces clinically significant weight loss. Attempts to determine the reason for nonattendance of initial dietetic appointment should be considered.

#### References

- National Institute for Clinical Excellence (NICE) (2001a) *Guidance on the Use of Orlistat for the Treatment of Obesity in Adults*. Technology Appraisal Guidance No. 22. London: NICE.
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- Royal College of Physicians (RCP) (2003) *Anti-Obesity Drugs. Guidance on Appropriate Prescribing and Management*. A Report of the Nutrition Committee of the Royal College of Physicians. London: RCP.

#### A study to determine the view of Irish preschools, on the use of a scored evaluation form as a motivational tool, to improve food provision in this setting

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**Background:** Preschools can have an impact on dietary intake, physical activity and energy balance patterns of children (Story *et al.*, 2006). In Ireland, Food & Nutrition Guidelines for preschools exist (Department of Health and Children, 2004), but methods to encourage provision of nutritious food in this setting are lacking and must be pursued to ensure guidelines are followed. A preliminary needs assessment, determined that preschools were in favour of introducing the model of a nutrition incentive scheme (Guiden & Johnston, 2004). This study aimed to ascertain the opinion of preschool providers on the use and practicality of a scored nutrition evaluation form, as a potential motivational tool, with the goal of using this in a future incentive scheme.

**Methods:** A scored evaluation form, based on agreed best practice, was created by a multidisciplinary preschool nutrition team, including: community dietitian; preschool inspector; training officer; child minding advisory officer and preschool services manager. Nineteen randomly selected preschools in Co. Laois and Co. Offaly took part in a qualitative evaluation of their current nutrition practice using this form. The evaluation was administered by a researcher, who observed mealtime practices, and then discussed each criterion with the preschool provider, focusing on: comments on each criterion; understanding of all criteria; need for improvement; feasibility of implementing changes; and issues regarding resources and staffing. All feedback was recorded, collated and themes developed.

**Results:** Out of a possible score of 50, total scores given ranged 5–29 (mean 18.2; median 19). Criteria changes thought to be feasible included: introducing more healthy snacks; having healthy eating weeks to raise parental awareness; creating written policy; encouraging water; using diluted fruit juice; giving unprocessed foods; distributing healthy eating leaflets; displaying breastfeeding information. Perceived barriers to changing practice included: acceptability of healthy celebration food and activities; cost of implementing changes; children's refusal to eat healthy foods; menu planning; parental influences.

**Discussion:** All preschool providers wanted more information on the scoring system and on each of the criterion; rationale; benefits; and implementation methods. The provision of background information and education in parallel with the scored evaluation form is therefore vital to its success. Furthermore, to ensure that the score which a preschool achieves accurately reflects their current practice, validation of the scored evaluation form must be undertaken.

**Conclusions:** Based on the needs identified, the next step in progressing with the nutrition incentive scheme is to modify and validate the scored evaluation form, and to develop a user-friendly nutrition information resource and training pack to support preschools in improving food provision and practice.

#### References

- Department of Health and Children (2004) *Food and Nutrition Guidelines for Pre-school Services*. Dublin: Department of Health and Children.
- Guiden, H. & Johnston, C. (2004) *Determination of a "Healthy Food Award" Scheme in the Pre-school Setting of the Midland Health Board*. Dublin: Department of Community Nutrition & Dietetics, Midland Health Board.
- Story, M., Kaphingst, K.M. & French, S. (2006) The role of child care settings in obesity prevention. *Future Child* 16, 143–168.

#### Improving fluid intake in 11- to 13-year-old Irish children using a school based intervention

C.J. Molloy<sup>1</sup>, O. Murray<sup>2</sup>, R. McEvoy<sup>3</sup>, J. Lee<sup>4</sup> and C.G. Slattery<sup>1</sup>

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**Background:** Hydration status has been shown to affect alertness, short-term memory, arithmetic ability, and visuomotor tracking (Gopinathan *et al.*, 1988); however, evidence suggests poor intake of water and milk in Irish

## Appendix 17

### Pre-school Inspection Team support identification questionnaire



#### ‘HIP (Healthy Incentive for Pre-Schools) Project’

Charlotte Johnston Molloy, Senior Community Dietitian,  
Community Nutrition & Dietetic Service,  
HSE Dublin Mid-Leinster,  
Marlinstown Office Park,  
Mullingar, Co. Westmeath.

Tel: 044 93 53220/ Mob: 086 6012160/ email: charlotte.johnston@hse.ie

### Support Development Process

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- **Pick the answer which you think best fits the question; in some cases more than one statement / answer is true.**
  - **Please circle each bullet point you feel is most appropriate**
1. Which do you feel best describes a ‘whole food policy’?
    - Healthy food policy developed by pre-school providers and kept in policy and procedures folder.
    - Healthy food policy developed by pre-school providers in association with parents and staff displayed in hallway for everyone to see.
    - A section in the pre-school’s prospectus on healthy food and nutrition.
  2. What would you class as evidence of food related activities?
    - Food models, food posters, and food crafts
    - Planting plants and growing
    - Information leaflets and posters for parents
  3. What is the recommended level of physical activity for pre-schools children?
    - 30 minutes most days of the week
    - 40 minutes most days of the week
    - 60 minutes most days of the week
  4. Why do children need to go outside everyday?
    - To increase appetite
    - To increase vitamin D creation
    - To build up strength and fitness.
  5. At 4-6 months infants should be getting which of the following food consistencies:
    - Pureed and of soft consistency with lumps
    - Depends on whether infant is bottle fed or breast fed
    - Nothing until they are at least 6 months old.

6. At 6-9 months infants should be getting which of the following food consistencies:
  - Pureed and soft, without lumps
  - Minced or mashed to a less fine texture
  - Chunky mashed texture, moving to food chopped into bite size pieces
7. 9-12 months children should be getting which of the following food consistencies:
  - Pureed and soft, without lumps
  - Minced or mashed to a less fine texture
  - Chunky mashed texture moving to food chopped into bite size pieces
8. At 4-6 months infants should be getting which of the following weaning foods:
  - meat, peas, beans, fruit, vegetables, potato and gluten free cereals
  - Depends on whether infant is bottle fed or breast fed
  - peas, beans, fruit, vegetables, potato and gluten free cereals
9. At 6-9 months infants should be introduced to:
  - gluten containing foods
  - yoghurts
  - cheese
10. What age should children be encouraged to begin feeding themselves:
  - 9-12 months
  - 12-15 months
  - 15-18 months
11. Which of the following foods are the best sources of iron:
  - chicken and fish
  - spinach, cabbage, beans and wholemeal brown bread
  - beef, pork and ham
12. What age should a beaker be introduced:
  - 4 months
  - 6 months
  - 12 months
13. At what age should an infant be weaned from a bottle:
  - 12 months
  - 18 months
  - 24 months
14. Which type of cup is best for infants:
  - two handled beaker with spill proof lid
  - two handled beaker with free flow lid
  - two handled beaker with no lid

15. Portion of protein food for 3 year old child:
- 30g / 1 oz or 1/8 cup
  - 60g / 2 oz / ¼ cup
  - 90g / 3 oz / ⅓ cup
16. Portion of starchy food for 3 year old child:
- 1 small potato / 1 tblsp pasta / 1 tblsp rice / ½ slice bread
  - 1 medium potato / 2 tblsp pasta / 2 tblsp rice / 1 slice bread
  - 1 large potato / 4 tblsp pasta / 4 tblsp rice / 2 slices bread
17. Portion of dairy food for 3 year old child:
- 2 slices of cheese / ½ yoghurt / 200 ml / milk
  - 4 slices of cheese / 1 yoghurt / 400 ml milk
  - 6 slices of cheese / 1 ½ yoghurts / 600ml milk
18. Portion of vegetables
- 1 tblsp vegetables
  - 2 tblsp vegetables
  - 3 tblsp vegetables
19. Fruit portion
- ½ piece of fruit, i.e. ½ apple; ½ orange; ½ banana
  - 1 piece of fruit i.e. 1 apple; 1 orange; 1 banana
  - 2 pieces of fruit; i.e. 2 apples; 2 oranges; 2 bananas
20. What are the best drinks for children under 12 months:
- Cooled boiled water / formula / breast milk
  - Cooled boiled water / formula / breast milk / diluted juice
  - Cooled boiled water / formula / breast milk / juice
21. How much fluid should children (1-5 years) be getting each day:
- Up to 6 cups
  - 6-8 cups
  - 8-10 cups
22. Which drinks are the most tooth healthy for children 1-5 years:
- water ( fizzy or plain); milk ; juice
  - water ; milk
  - water; diluted juice; milk
23. Which of the following would be seen to be good environment to encourage children to eat:
- Sitting at the table with children and eating something too
  - Moving between children and helping to feed
  - Allowing children to leave table as they finish their meals
  - Encourage children to remain at the table until all children are finished eating.

## Appendix 18

### Letter sent to pre-schools in Co. Wicklow regarding Healthy Incentive for Pre-schools project (phase 1)



Health Promotion,  
HSE Civic Centre,  
Main Street,  
Bray,  
Co. Wicklow.

Community Nutrition & Dietetic Service,  
Block A,  
Marlinstown Office Park,  
Mullingar,  
Co. Westmeath.

6<sup>th</sup> May 2008,

#### RE: Pilot nutrition project in Co. Wicklow in June 2008

Dear Pre-School Manager,

The HSE, in association with *Safefood*, is due to start a pilot nutrition project in Full Day Care Pre-schools in Counties Wicklow, Laois, Longford, Westmeath and Offaly.

The first part of this pilot project will take place in Full Day Care Pre-schools in Co. Wicklow in June 2008. Pre-schools will be chosen randomly to take part, so an invitation to become involved will not be a reflection on current practice.

A Community Dietitian will be visiting pre-schools to get a better understanding of current food practice.

All information gathered will be treated in the **strictest confidence**. **No preschool will be identifiable from the results of the pilot.** The information that is collected will be used to plan a support scheme for pre-schools in the future.

We will be in touch with you by telephone in the coming weeks and we hope that you will be happy to get involved in this pilot project.

If you have any questions about this letter please do not hesitate to contact Charlotte at 044 93 53220.

Best regards,

Sarah Mumford  
**Senior Community Dietitian**  
**HSE - Dublin Mid-Leinster**

Charlotte Johnston Molloy  
**Senior Community Dietitian**  
**HSE - Dublin Mid-Leinster**

## Appendix 19

### Letter to pre-school providers to confirm visits (phase 1)



#### **'HIP (Healthy Incentive for Pre-Schools) Pilot Project'**

Charlotte Johnston Molloy, Senior Community Dietitian,  
Community Nutrition & Dietetic Service,  
HSE Dublin Mid-Leinster,  
Marlinstown Office Park,  
Mullingar, Co. Westmeath.

Tel: 044 93 53220/ Mob: 086 6012160/ email: charlotte.johnston@hse.ie

#### **Re: Pilot of a food and nutrition tool for use in the pre-school setting**

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Dear

I would like to take the opportunity to thank you for agreeing to allow me to visit your pre-school to carry out a pilot of the pre-school tool / evaluation form in the pre-school setting.

I would like to confirm with you that I am due to visit your pre-school at:

I look forward to meeting with you then. If you have any queries, comments or you would like to discuss anything with me, please do give me a call at 044 93 53220 / 086 6012160.

Yours sincerely,

Charlotte Johnston Molloy

Senior Community Dietitian

## **Appendix 20**

### **Pre-publication version of the article on the pilot (phase 1) of the Healthy Incentive for Pre-schools project**

Published in the journal 'Nutrition & Food Science'.

Johnston Molloy C, Corish C, Kearney J, Hayes N, & Glennon Slattery C (2011) Developing a nutrition assessment tool for Irish pre-schools. *Nutrition & Food Science* **41**, 44-53.

### **Developing a nutrition assessment tool for Irish pre-schools.**

#### ***Introduction***

It is acknowledged that nutrition education is a key constituent of lifelong healthy eating and should start from the early stages of life (Pérez-Rodrigo & Aranceta, 2001). Flynn *et al.*, (2006), in reviewing best practice in reducing obesity and related chronic disease in children and young people, noted that there are few such interventions in the pre-school setting and recommended that funding should be directed to develop prevention programmes in this area.

There has been an increase in obesity and overweight observed in school aged children in many countries (Mårild *et al.*, 2004) and this is no different in Ireland with the National Children's Food Survey (Irish Universities Nutrition Alliance, 2005) reporting a 2-fold increase in overweight in school age boys, and a 3-fold increase in obesity in school age girls, since the Irish National Nutrition Survey of 1990 (Irish Nutrition and Dietetic Institute, 1990). The report of the National Taskforce of Obesity (Department of Health and Children (Ireland), 2005) notes that excess body weight is now the most common childhood disease in Europe, with some countries having as many as one in three children overweight or obese. One of its many recommendations is that the Health Service Executive (HSE) in Ireland, in implementing the Childcare Regulations 1996 and (Amendment) Regulations 1997, (Department of Health and Children (Ireland), 1998) should ensure that pre-school services support healthy eating and healthy living.

'The Food and Nutrition Guidelines for Pre-School Services' (Department of Health and Children (Ireland), 2004) recommend that children in full day care (more than 5 hours) are offered at least two meals and two snacks whilst in the pre-school service. Currently in Ireland, there is no uniform formal training for pre-school providers in the



area of nutrition and healthy food provision, nor the legislation to enforce such training. As Food & Nutrition Guidelines for pre-schools are not mandatory, methods to encourage the provision of nutritious food in this setting must be investigated, implemented and evaluated.

In 2001, the Community Nutrition and Dietetics and the Pre-School Services of the Health Service Executive (HSE) Dublin Mid-Leinster, Midland Area, in Ireland, co-ordinated the development of a multi-stakeholder team approach to the nutrition training of pre-school providers; this team included community dietitian; pre-school inspector; training officer; child minding advisory officer and pre-school services manager. A preliminary needs assessment determined that pre-schools were in favour of introducing the model of a nutrition incentive scheme (Guiden & Johnston, 2004). Following on from this investigation, an assessment form to evaluate and score pre-school nutrition practices (Scored Evaluation Form - SEF), based on a review of internationally agreed best nutrition practices in the pre-school setting, was created by the pre-school nutrition team. Nineteen pre-school childcare facilities in the Dublin Mid-Leinster Midland Area (Counties Laois and Offaly) took part in a pilot evaluation of their current nutritional practices using the scored evaluation form devised (Molloy *et al.*, 2007). This demonstrated the need for simplification of the assessment criteria, provision of information on nutrition in the pre-school child for the pre-school providers, practical advice on healthy eating in the pre-school setting and amendment and further investigation of the scoring system. A restructuring of the original Scored Evaluation Form (SEF) was undertaken and funding was obtained from the Health Service Executive and **safefood**, the Food Safety Promotion Board, to further investigate its use in the pre-school setting in a project known as the Healthy Incentive for Preschools (HIP) Project.

The aim of this article is to a) describe the modification and testing of the HIP Project's SEF and b) summarise the findings of a preliminary study of nutritional practices in preschools using the updated Scored Evaluation Form (SEF).

## **Materials and Methods**

### Sample population

All eligible full day care pre-schools in one county in Ireland, (Wicklow) (*n* 34), were contacted by the researcher and invited to take part in the study. Pre-schools with any previous contact with the Community Nutrition Service in the Midland Area, that was carrying out the study, were excluded. Twelve pre-schools agreed to participate. Permission to carry out the study in each school was initially obtained by telephone; written informed consent was also received from each pre-school manager before commencement of the study. Ethical approval for the project was obtained from the Research Ethics Committee of the Health Service Executive Dublin Mid-Leinster, Ireland and the Ethics Committee of the Dublin Institute of Technology.

### Scored evaluation form (SEF) modification

Each criterion on the original scored evaluation form (SEF) (Table 1) was checked to ensure no overlap between or within criteria existed, and a comprehensive literature review was carried out on each criterion to establish that all criteria were based on evidence of effectiveness.

Literature review was carried out on each of the criterion / questions on the Scored Evaluation Form (SEF). Papers were collected on each criterion in the SEF to determine best practice and compare all aspects of SEF to literature, to ensure the SEF measured best practice. Best practice was defined in the case of each criterion on the SEF. If it was not possible to identify best practice then a common sense approach was taken with the criterion.

Comparison was made between the SEF and the standardised inspection tool used by the Pre-school Inspection Team (PIT) to ensure no overlap between the two tools. The SEF was reviewed also to ensure that there was no overlap of issues within questions on the SEF.

The SEF was broken down into subsections for ease of use; this included sections on: the environment (all ages); weaning (6-12 months only); weaned children (over 12 months); and snacks weaned children (over 12 months). Each section contained six criteria.

**Table 1 An outline of SEF sub-categories and criteria**

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<b>Criterion sections and criteria on Scored Evaluation Form</b>
<b>Environment</b>
1. Whole school policy
2. Healthy reward scheme
3. Education activities
4. Planned physical activity
5. Outside in the day
6. Praised for eating
<b>Children under 12 months</b>
7. Weaning food appropriate
8. Feeding selves encouraged
9. Iron rich foods
10. Drinks for infants
11. Unlidded cup
<b>Children over 12 months</b>
12. Providers sitting with children
13. Help when eating
14. Protein portion @ main meal
15. Starch portion @ main meal
16. Dairy portion @ main meal
17. Veg portion @ main meal
<b>Snacks</b>
18. Fruit as snack
19. Water with meals
20. Water between meals
21. Only drinks offered
22. Snacks low in fat and sugar only

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An altered scoring system was devised based on the literature (Benjamin *et al.*, 2007; Alkon *et al.*, 2008). Following the literature review, the scoring system was revisited and the scoring system for each criterion was changed from a yes/ no system to a 'three way' value system (0; 1; 3). Services would be able to attain one of three possible score: 'does not meet standard' (zero points scored); 'partially meets standard' (one point scored); 'completely meets standard' (three points scored). HIP project criterion standards were created to explain and clarify the scoring system, and a classification range for the scoring system was determined: Participation (Score 0-24); Bronze (Score 25-49); Silver (Score 50 - 74), Gold (Score 75-99); Platinum (Score 100-120).

Drafts of the SEF were sent to Pre-school Inspection Team members and Pre-school Nutrition working group team members throughout the redevelopment phase of the SEF. A multiple choice questionnaire was developed and used with the pre-school inspection team (PIT) in order to determine their knowledge and training needs surrounding the SEF. The Pre-school Inspection Team was requested to use the SEF

during one pre-school visit. Feedback was collected from the PIT regarding their thoughts and views on the usability of the SEF in a practical setting.

A detailed assessment tool (DAT) was created to accompany the final SEF. All observations during each service visit were recorded on the Detailed Assessment Tool. In the DAT, each criterion from the SEF is characterised by a series of questions, especially designed for that criterion, which extrapolate and collect background information on the particular criterion, to ensure that evidence for criterion score is gathered. Criterion scores achieved during each pre-school visit were based on observations made and comparisons of these to the criterion standards developed for the project. An overall score was then assigned to each pre-school service using the SEF. This assessment tool was used to collect more in-depth information on each of the criteria in the SEF, for future validation purposes.

#### Scored Evaluation Form (SEF) testing

Data were collected in each pre-school service by one researcher using direct observation, noted as the gold standard for accuracy in measuring food in childcare (Gittelsohn *et al.*, 1994). Appointments to visit were made with each pre-school provider, at least two weeks prior to visit. One full day was spent in each pre-school carrying out observation of all aspects of food and nutrition practice. The researcher collected background information, using a detailed standard survey specially created for the HIP project, on each pre-school at the beginning of each pre-school visit. Meal and snack times were noted. Food and fluid given; portion sizes provided; the eating environment established for children and physical activity practices undertaken in each service were observed, and the SEF was used to document and score all information observed and collected. The information used to complete each criterion on the scored evaluation form was also corroborated, during the visit, using the accompanying Data Assessment Tool.

#### Data analysis

All data collected were coded and inputted into the Statistics Package for the Social Sciences (SPSS) for Windows, Version 15 (SPSS Inc., Chicago, IL, USA), and all statistical analysis was carried out using this statistical package. Statistical analysis of

frequencies was carried out on all variables. Descriptive exploration for normality and correlation and chi square analysis was also carried out. P values of less than 0.05 were used to indicate statistical significance.

## **Results**

### **Modification of the Scored Evaluation Form**

The scored evaluation form was transformed from its original format. Criteria were grouped into sub-sections and each criterion was based on best practice evidence. The scoring system included three possible scores and a categorisation format for overall scores was developed.

While considerable revision of the SEF was undertaken prior to this investigation; this study noted that the sections included in the revised SEF needed further amendment to ensure it could be used in all services regardless of the age of child attending. While many pre-schools did not have children aged less than 12 months, it became apparent that a number of issues which should be relevant only to children aged under 12 months were also pertinent to toddlers over the age of 12 months i.e. provision of: age appropriate consistencies; iron rich food; two handled un-lidded beaker; chair versus high chair; or self feeding versus being fed.

It was also noted that the phrasing of some criteria need alteration to avoid misinterpretation, for example, the necessity to indicate quantity i.e. a glass / portion / 200ml milk.

The inclusion of criteria that will measure 'family style food service' will also be necessary; i.e. to measure number of pre-school providers sitting with children; to determine amount of time allocated to meal and snack times.

The utensils used by children must also be measured; as until now only cup usage was documented. This study demonstrated that provision of plates, cutlery and bottles needed to be assessed in all age groups.

## Pre-school services involved in study

Eleven of the pre-schools visited were privately run and one was a ‘not for profit’ community based pre-school. Table 2 outlines the characteristics of the pre-schools involved.

**Table 2 Pre-school characteristics (n=12)**

	<b>Mean</b>	<b>SD</b>
No. of carers	6.7	2.4
No. of children	32.7	16.3
No. of boys	14.3	5.9
No. of girls	10.0	4.7
No. of children < 12 m	0.6	1.5
No. of children 12-24 m	7.8	8.2
No. of children 25-36 m	11.3	7.5
No. of children > 36 m	20.2	15.1
No. of rooms in facility	2.9	1.1
Daily care charge to parents (€); when services provide food	40.33	6.43
Weekly expenditure on food (€); when services provide food	136.67	70.94

m, month  
€, euro  
No., number  
SD, standard deviation

## The scoring system

The overall score in each pre-school service was also determined using the Scored Evaluation Form. Services were divided into two categories for calculating the total score: services with infants less than twelve months: mean score 43 (SD 12.5); and services which had children over 12 months only: mean score 22.5 (SD 4.5).

A negative correlation was noted between: the number of children in the pre-school service and the overall score in services with infants less than twelve months ( $r=-0.41$ ,  $P<0.05$ ); and the number of children in the pre-school service and the overall score in services with children over 12 months only ( $r=-.60$ ,  $P<0.05$ ). Table 3 outlines the scores achieved by each service in each SEF sub-category.

**Table 3 Pre-school scores on the SEF instrument**

Pre-schools	Environment section	< 12m section	> 12m section	Snack section	Overall score (<12m age group in service)	Overall score (>12m age group only in service)
1	12	6	8	3	29	n/a
2	10	12	16	15	53	n/a
3	8	n/a	4	7	n/a	19
4	10	n/a	8	12	n/a	30
5	7	n/a	8	6	n/a	21
6	10	n/a	7	10	n/a	27
7	8	n/a	8	3	n/a	19
8	4	n/a	9	12	n/a	25
9	5	n/a	3	9	n/a	17
10	n/o	n/o	n/o	n/o	n/o	n/o
11	4	n/a	8	10	n/a	22
12	13	14	8	12	47	n/a
<b>Mean</b>	<b>8.27</b>	<b>10.66</b>	<b>7.90</b>	<b>9.00</b>	<b>43</b>	<b>22.5</b>
<b>(SD)</b>	<b>(3.06)</b>	<b>(4.16)</b>	<b>(3.26)</b>	<b>(3.87)</b>	<b>(12.5)</b>	<b>(4.47)</b>

n/a, not applicable

n/o, not observed

SEF, Scored Evaluation Form

SD, standard deviation

M, month

<, less than

>, greater than

### Food and fluid provision

While the majority of pre-schools ( $n = 10$ ) provided food on the premises, outside catering companies also provided food ( $n = 2$ ), as did parents ( $n = 7$ ). No association was noted between adequate portion size provision and the source of the food provided i.e. pre-school, parental or outside catering food provision.

Overall, it was noted that portion sizes provided to infants and toddlers were inadequate. The protein offered to children, at the main meal time, was observed to be less than one serving, in seven of the services visited. In eight services, the vegetable given was observed to be less than one serving; and in nine services no dairy food was provided at the main meal. Six services provided the recommended serving size of starchy food; with one pre-school providing less than one serving; and one providing a serving that was greater than that recommended.

A variety of snacks were provided to children, with fromage frais (*n* 6) and fruit (*n* 9) being the snacks offered with the greatest frequency. Whilst the majority of pre-schools are providing fruit, in most cases it was noted that the amount of fruit given did not constitute a portion. Associations were noted between parental food provision and snack type for some snacks. Significant positive association was noted between parental snack provision and provision of cheese as a snack ( $p=0.024$ ) and some association was noted between parental snack provision and the provision of fromage frais as a snack ( $p=0.061$ ).

While three services provided only milk or water to drink; all other services offered more drink types than this, and juice and dilutable fruit drinks were offered most often. In frequency terms, while seven preschools were noted to provide tap water to drink with meals and snacks; only one pre-school offered tap water outside these times.

#### Food environment

A lack of family style food service was apparent. In three services, providers sat at tables with older children; all children then waited to commence eating until every child at the table had been served their food. In two pre-schools, older children were expected to remain at the table until all children at the table had finished eating.

The feeding of infants and young toddlers to speed up meal times was apparent; with the majority (*n* 8) of services giving assistance to children if they were eating slowly. Encouragement to self feed was lacking in the majority of services, and in many cases infants and young toddlers who were at an age where they could be sitting at age appropriate tables and chairs, were placed in high chairs and spoon fed by providers, without encouragement to self feed at any stage during the meal.

When providers sat with children, and ate with children (*n* 4), the meal / snack was perceived by the researcher to be more pleasant and relaxed as it was noted that providers took time to talk to children about various issues, which was in contrast to those pre-schools where providers stood / knelt beside children and urged them to hurry up or offered to feed the children in an attempt to speed up the meal time.



## Whole school nutrition policy

Few pre-schools had nutrition policies ( $n = 6$ ), and, if available, they had not been produced using the 'whole school' approach to policy development (Southern Health Board, 1999; Department of Health and Children (Ireland), 2004). Only one service displayed their nutrition policy for parents and visitors to see.

## Physical activity

Some form of physical activity was observed in the majority of services ( $n = 8$ ); however, in all but one service, outdoor activity was not observed if it was raining. Four services provided children with the recommended minimum amount of physical activity of 60 minutes (Department of Health and Children & Health Service Executive, 2009) on the day that the service was visited.

## Discussion

This study has enabled the testing of the revised Scored Evaluation Form in the pre-school setting and has allowed each criterion to be explored to ensure its suitability and practicality for further use in this setting. The use of this observation methodology provided a powerful tool to gain in-depth and rich data on individual practices in each service (Simons-Morton & Baranowski, 1991; Gittelsohn *et al.*, 1994) and it has also given some initial insight into the nutrition issues that may need to be addressed in the pre-school setting.

Due to the observations made, further revision of the SEF now needs to take place, before it can be used in future work. Change to overall sub-category structure will be undertaken and criteria will be included to ensure 'family style food service' can be assessed.

The direct observation of the plating of food, before distribution, was vital to allow the researcher to determine portion sizes accurately. As it was observed that the portion sizes provided to infants and toddlers were inadequate with poor provision of iron containing, vegetable and dairy foods, it is important that food portion size provision is observed by the researcher and is recorded on the SEF. Previous studies have shown that infants and toddlers have low intakes of iron rich foods, vegetables and dairy foods

(Society for Nutrition Education, 2003) and the results of this study provide similar findings.

The development of a food portion atlas and list of household measures for portion sizes are necessary components of an educational resource to accompany the SEF. Pre-school providers need education on portion sizes appropriate for pre-school children of different ages if current practice is to change.

A lack of nutrition policies in pre-schools was also apparent. Those who had a policy, had not produced them using the 'whole school approach' to policy development (Southern Health Board, 1999), the approach regarded as the gold standard in policy production for long lasting, effective policy production (Department of Health and Children (Ireland), 2004).

The time allocated to the provision of meals and snacks in pre-school children's day warrants comment. This study observed that meals tend to be rushed with children being told to hurry up, cleaning taking place, and children leaving the table and being allowed to play while other children are still eating. Many guidelines refer to the educational and health benefits of family style service, with adults sitting, eating, and making conversation with children during mealtimes, allowing children to self serve, allowing sufficient time for meals and providing correct utensils such as plates for all meals and snacks (American Academy of Pediatrics & American Public Health Association, 2002; United States Department of Health and Human Services, 2002; American Dietetic Association, 2005; United States Department of Agriculture, 2008). From the results of this study, it would appear that Irish pre-schools in the majority of cases, do not provide family style service, do not allow adequate time for meals or snacks, do not allow self service and do not provide adequate age appropriate cutlery, plates or drinking vessels for infants and children. It is important that this aspect of pre-school nutrition is also captured and rated in the SEF.

## **Conclusion**

In order to use the SEF to accurately evaluate nutritional practice in the Irish pre-school setting it is necessary to make the changes described to clarify and extend the scope of the assessment criteria and ensure that all questions are unambiguous. The SEF should then be evaluated to determine its utility as an intervention tool whereby its use, in conjunction with practical, supportive education for the pre-school providers may lead

to positive changes in nutrition practice in the pre-school setting. This preliminary project highlights the need for such an intervention.

### **Acknowledgements**

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## **Appendix 21**

### **Pre-publication version of ‘Letter to the Editor’ on development of the ‘food atlas of serving sizes of common foods for pre-school children’.**

Published in the ‘Journal of Human Nutrition and Dietetics’.

Johnston Molloy C, Corish C, Kearney J, Hayes N & Glennon Slattery C (2010) Letters to the Editor. *J Hum Nutr Diet* **23**, 426-427.

#### **Letters to the Editor**

Dear Editor,

It was with great interest that we read the study on childcare environment and dietary intake of children in pre-school childcare in the Netherlands (Gubbels *et al.*, 2010). With more parents now relying ‘on child care providers to share parents’ traditional role of ‘gatekeeper’ on their children’s nutrient intake’ (American Dietetic Association, 2005), the educational and environmental factors influencing the development of healthy eating patterns of children in full day care is becoming predominantly that of the childcare provider (Benjamin *et al.*, 2008, Moore *et al.*, 2005). While there are a number of studies that look at this issue in the United States, there is indeed a lack of published European research and Flynn *et al.* (2006) have highlighted that there are few nutrition interventions in this setting, recommending that funding should be directed to develop such programmes.

While the study of Gubbels *et al.*, demonstrated an assessment of overall dietary energy, saturated fat and dietary fibre, the quantity and variety of food served to children also requires consideration. If inadequate nutritious food is served to children, they are not in a position to obtain sufficient nutrients, regardless of the environment in which they eat. In Ireland, we are carrying out an observation based intervention study in child care centres (‘Healthy Incentive for Pre-schools project’). As well as observing the environmental factors, we also are determining the food given to the children.

While Gubbels *et al.*, noted that they estimated dietary intake ‘in standard food units (e.g. cups, pieces)’ (p 98), they do not define the standards that were used to determine the food units. Use of ‘standard food units’ may become particularly complex when considering ‘composite food dishes’ and definition of standards is needed to prevent misinterpretation and allow others to replicate the methodology used.

Preliminary work carried out for the ‘Healthy Incentive for Pre-schools project’ (Molloy *et al.*, 2007) highlighted this issue and the use of a collection of photographs to determine the food servings provided by childcare providers was considered beneficial, particularly if that resource was accompanied by a reference guide containing weights of foods and accompanying household measurements of these foods. Although there is a food portion size photographic atlas for adults (Nelson *et al.*, 2002), no such tool appropriate for children’s serving sizes could be found in the published literature. The ‘Food Serving Size Atlas for Pre-school Children’ was produced based on practical guidelines from the literature (Nelson and Haraldsdóttir, 1998, Williamson *et al.*, 2003). Photographs of a wide variety of foods recommended for pre-school children’s meals and snacks (*n*, 344) were taken during the preparation of the food serving size atlas (Irish Health Service Executive, 2004, Department of Health and Children (Ireland), 2004, Crawley, 2006); these included photos of ‘individual’ foods (*n*, 205) and ‘composite foods’ (*n* 139). The food serving size atlas has been used to assist in determining the serving sizes being plated by childcare providers with data collection just completed, prior to an intervention which will aim to encourage and support pre-schools to improve their nutritional practices.

We congratulate Gubbels *et al.*, for undertaking work in the childcare setting, as all research carried out in this setting will ultimately inform interventions to improve the food provided in childcare services.

C. Johnston Molloy<sup>1</sup>, C. Corish<sup>2</sup>, J. Kearney<sup>2</sup>, N. Hayes<sup>3</sup> & C. Glennon Slattery<sup>1</sup>  
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## Appendix 22

### Letter sent to Pre-schools regarding project enrolment in midland region



Community Nutrition & Dietetic Service,  
Block A,  
Marlinstown Office Park,  
Mullingar,  
Co. Westmeath.

7<sup>th</sup> May 2008

#### RE: HIP (Healthy Incentive for Pre-Schools) Project

Dear Pre-School Manager,

The HSE, in association with **SafeFood**, is due to begin a pilot nutrition incentive project in September 2008. This project is for full day care pre-schools in Counties Laois, Offaly, Longford and Westmeath, and will run over a 4 year period.

Over the last number of years pre-schools have shown great interest in taking part in a nutrition incentive scheme, and this project is now ready to start.

We are now looking for full day care pre-schools to apply to become involved.

This is your opportunity to sign up for a chance to become involved in an exciting new project. If you are selected, you will be able to:

- Tell us the type of incentives that will help you to make changes in your nutrition practice.
- Get recognition for the nutrition work that you do as part of the project.
- Receive a profile from the media for the differences you make to the food environment in your pre-school.

If you would like to be considered for a place in this new pilot project please **fill in the slip below** and **return it to us in the stamp addressed envelope** by the **16<sup>th</sup> May 2008**. If you have any questions on the project please do give us a call at:

**044 93 53220 / 057 93 70640.**

Best regards,

***Kara & Charlotte***

Kara Murphy - Pre-school Trainer / Charlotte Johnston - Community Dietitian

-----  
**I wish to apply to be considered for a place on the HIP Project.**

Name: \_\_\_\_\_

Address \_\_\_\_\_

Email: \_\_\_\_\_

Telephone: \_\_\_\_\_

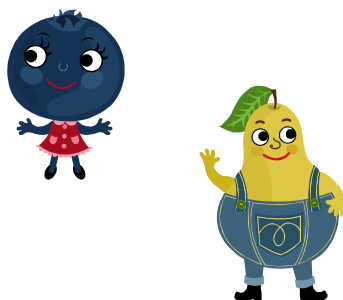
Mobile: \_\_\_\_\_

Signature: \_\_\_\_\_



## Appendix 23

### Letter to pre-schools regarding project commencement in midland region



Community Nutrition & Dietetic Service,  
Block A,  
Marlinstown Office Park,  
Mullingar,  
Co. Westmeath.

13<sup>th</sup> November 2008

**RE: HIP (Healthy Incentive for Pre-Schools) Project**

Dear Pre-School Provider,

Thank you for applying to take part in the Healthy Incentive for Pre-schools (HIP) Project. You have been successful in getting a place for your pre-school in this project.

The HIP project will begin at the end of November 2008. In the first phase of the project Charlotte Johnston, Community Dietitian will visit you. She will spend a day in your pre-school, during which she will explain the project to you in detail, and will observe food and nutrition practice.

You will be contacted by telephone and given two weeks notice of Charlotte's visit. These visits will take place between **November 2008 and June 2009**.

If you have any questions on the project please do give us a call at:

**044 93 53220.**

Best regards,

***Kara & Charlotte***

Kara Murphy - Pre-school Trainer / Charlotte Johnston - Community Dietitian

## **Appendix 24**

### **Pre-publication version of the article on the determination of the ‘voice of the child’.**

Published in the journal ‘Research Ethics’.

Johnston Molloy C, Hayes N, Kearney J, Glennon Slattery C & Corish C (2012) Researching young children's perception of food in Irish pre-schools: An ethical dilemma. *Research Ethics* **8**, 155-164.

### **Researching young children's perception of food in Irish pre-schools: An ethical dilemma.**

#### **Abstract**

Poor nutrition habits have been reported in the childcare setting. While the literature advocates the need to carry out ‘Voice of the Child’ research, few studies have explored this methodology with regard to children and food, in particular in the pre-school setting. This paper aims to outline the ethical issues raised by a Research Ethics Committee and discuss the impact of these issues on a study that hoped to determine the food perceptions of children (aged three to four years) within an ongoing nutrition and lifestyle pre-school project in Ireland.

Ethical approval was granted for this study but only upon the clarification of two aspects: that only hedonic symbols previously used in the literature could be included in the study; and that parental consent be obtained from both parents of each child. Children were shown food pictures and asked to use the hedonic symbols to answer questions posed to them on the food. Due to the ethical constraints imposed by the requirement for two parent consent, seven children, of a potential sample of eighty five, were eligible to partake in the study. These children did not seem to understand the hedonic symbols recommended for use by the ethics committee; therefore preventing the collection of in-depth qualitative data.

The ethical constraints placed on this study impacted on both its design and its methodology and are discussed in relation to national and international ethical guidance and legislation. Future research with children regarding food choice must balance the need for strict ethical standards with the need to explore children's views on this subject.

### **Key words**

**Research ethics committees; parental consent; children's consent; voice of the child; children's participation; pre-school nutrition.**

### **Introduction**

Children have traditionally been viewed as the objects of research; with research being carried out *on*, rather than *with* them [1]. Grover [2] states that the strength of research will be affected if children are not participants in a process which allows them to tell their story. In recent times, children have been noted to be 'active beings'; however, this does not always seem to translate into action research [3]. The last decade has seen an increase in the literature highlighting the need for 'Voice of the Child' (VOC) research [4]. A policy document submitted to the Minister for Children by the National Children's Advisory Council in Ireland [5] noted that '*the voices of younger children were not being heard*' and that '*different methodologies must be explored and utilised to hear the voices of young children*'.

In an editorial on medical research involving children, Gevers [6] noted that while it is agreed that children need to be protected in a research situation, there are concerns that if regulation is too tight, this may prevent health research, that may be in their interest in the long term, taking place. In a review of the literature, Dixon-Woods et al [7]

advocated an urgent need for social science study of children's participation in research to inform legal and ethical frameworks.

In preparation for direct research with children, submissions for ethical approval are made to Research Ethics Committees (RECs); these committees have a number of roles: the discouragement of unethical research; the provision of a public affirmation of ethical integrity for researchers, and the enhancement of sensitivity to ethical issues in research [8]. While RECs are now evident in many health care settings to regulate and ensure ethical research; few sociologists have chosen them as a study option [9].

The aim of this paper is to outline the ethical issues raised by a REC, and discuss the impact of these issues on a study that hoped to determine the food perceptions of children (aged three to four years), within an ongoing nutrition and lifestyle pre-school project in Ireland.

### **Determination of the Voice of the Child in the HIP project**

While many children are now cared for outside the home, inadequate nutrition practices in pre-schools have been reported [10-12]. The Healthy Incentive for Pre-schools (HIP) Project is ongoing in the Midlands of Ireland and aims to develop an intervention scheme to incentivize pre-schools to improve their nutrition and health practices. With the interest and calls for 'Voice of the Child' (VOC) research from the literature [2], the National Advisory Group for the HIP project recommended an investigation to provide insight into children's perception of food.

In preparation for direct research with children on the topic of food preference, a pre-study exercise was carried out to determine how best to capture the opinions young children have about food. To this end, two different symbolic systems were examined. This indicated that children seemed to understand a set of three smiley hedonic symbols from Microsoft Clip Art, correctly identifying the smiley symbols. However, when

presented with a set of five facial hedonic symbols, described by Chen et al [13], they had difficulty explaining the meaning of the different symbols.

### **REC ethical constraints on project work**

Ethical approval for the 'Voice of the Child' study was sought from the Research Ethics Committee of the Health Service Executive Dublin Mid-Leinster, Ireland and the Ethics Committee of the Dublin Institute of Technology. While ethical approval was granted by the Research Ethics Committee of the academic institution, the health services research ethics committee noted that ethical approval would only be granted if two conditions were met; firstly, that only a specific set of hedonic symbols from the literature could be used [13] and, secondly, that parental consent was obtained from both parents of each child that was to take part in the process. Co-ordination between dual ethics committees at a management level may have prevented this variance in approval from occurring; however, there was no co-ordination in place and, therefore, the research dietitian believed she could only proceed with the research by following all the conditions laid down by both committees. The stipulations imposed on the researcher, however, impinged on both the design and methodology of the present study.

### **Ethical conditions and effect on study sample**

HIP project pre-schools which had been visited previously by the researcher (n = 48) were excluded from the sampling process as such visits may have had an influence on practice and children's views in these settings. The remaining pre-schools (n = 15) were divided according to the number of full day care children attending and their deprivation score [14]. Each service identified in the sampling process was contacted by telephone. A verbal explanation of the VOC process was detailed. Settings were

advised that informed pre-school manager and two-parent consent would be necessary. Information and consent forms were sent to each pre-school manager at least one month prior to the arranged visit date. A follow up telephone call was made to each manager just prior to the scheduled visit to confirm visit details and ensure that parental consent had been obtained.

Nine of fifteen pre-schools (n = 85 children, aged three to four years) agreed to take part in this element of the overall study. It became apparent upon attending each pre-school to carry out the VOC work, that pre-schools had experienced difficulty in collecting consent from both parents of each prospective child. Table 1 outlines the numbers of children and consent for the present study.

**Table 1 Number of pre-schools and parental consent**

	Number of pre-schools	Number of children
Services agreeing to participate	9	85
No consent obtained	2	n/a
Consent from one parent	5	n/a
Consent from two parents	2	7

n/a, not applicable

In hindsight one may hypothesise as to why 'two-parent consent' was required by the health service REC; there may have been a number of factors that influenced this decision. The possible reasons for this will now be outlined.

Firstly, although it would not be possible to know the actual membership representation of the REC at the time of the study ethical application, the Research Ethics Review Guideline [15] notes that the REC should include: hospital physicians; hospital and community nursing staff; hospital and community senior allied health professionals; a general practitioner; a solicitor; a lay person and a public health physician. With this representation in mind, one may postulate that these membership would not reflect the

socio-economic status of the local community and that this may have contributed to the REC being out of step with the parental arrangements of children in the wider community. Requesting the inclusion of two-parent consent precluded, based on national Irish figures for one parent families, one third of the potential population from becoming involved in the study as 35.2% of Irish families are noted to be lone parent families [16].

The second possible reason for requesting ‘two-parent consent’ may have been due to apprehension. In the United Kingdom (UK), Angell et al [17], in reviewing 80 randomly sampled letters issued by NHS (National Health Service) RECs, determined that some evidence existed that RECs were concerned about what may happen if only one parent were to sign a consent form. This concern is evident despite the fact that, as Angell et al note, there is no problem with this issue in the eyes of the UK law, as clinical trial regulations only require one parent to provide signed consent.

A possible third reason for requesting two parents to sign consent forms may have been due to confusion in the REC on the issue of appropriate consent for minors in clinical and non-clinical trials in Ireland.

The two-parent consent requirement of the Irish Health Service based REC in this study was outlined in their response letter as being ‘*a legislative requirement*’. However, nationally, lack of clarity amongst RECs was apparent; this may be due to the absence of one body overseeing the governance of RECs in Ireland. In 2008, a national review of REC practice [18] was undertaken with participants suggesting that ‘*there is a legislative vacuum and there is no clarity for non-clinical trials research. Some RECs operate to their own SOPs and some follow the guidelines available from the Irish Council for Bioethics*’ and that ‘*the clinical trials act was brought in for a specific purpose but what it has done, or appears to have done, is (it) has forced people into a*

*way of thinking, that maybe, could be replicated with research that's not of a clinical trials nature'.*

The European Communities (Clinical Trials on Medicinal products for Human Use) Regulations 2004, that govern clinical trials and the establishment and direction of ethics committees [19], outline that *'every person with parental responsibility for the minor'* should be consulted, and give their consent to a minor taking part in a trial. The Irish Council for Bioethics [20] guidelines state that *'parental or guardian's consent must be sought'* and Sheikh [21] maintains that all research, apart from a clinical trial, is not governed by legislation in Ireland, concluding that that *'where a minor is concerned, decisions in relation to its welfare are decided by the parent / legal guardian'*. It is possible that the issue of consent in this study, when considered by the REC, was treated as consent for a clinical trial.

It is very welcome to note that in response to the REC practice review [18], a comprehensive package of consultations was undertaken to develop a standard national REC application form and guidance document for use in Ireland. This document was introduced in 2011 [22] and in it the chairperson, in her introduction, states that the standardised approach was introduced in response to the fact that *'the ethical review process had become an obstacle to research rather than a facilitator of it'*. It is interesting to note that the standard guidance now specifically outlines the requirement for minors with regard to consent: *'persons under the age of 16 cannot give consent to take part in most research studies, and (if consent is being sought) it should be sought from one parent or one legal guardian. It is recommended however that persons under the age of 16 be assented to participate in a manner appropriate to their age and level of understanding'* [22].



Fine and Sandstrom [23] suggest that *‘in some ways, the idea of informed consent with preschoolers would seem like a laughable conceit’* but go on to say that *‘children should be afforded some explanation’* and that *‘this simple explanation might be sufficient to provide a measure of informed consent consistent with the informants’ understanding’*. The issue of assent with minors is an important consideration, particularly when one is aiming to give children a voice. In this study, while those children partaking in the study were asked for verbal assent, there were other children (whose parents had not consented) who specifically asked why they could not partake in the study exercise and expressed disappointment when they were not able to do so.

Biggs [24] notes that in the UK there is a number of conflicting issues on consent between the law and ethical guidance and that the autonomy of minors is better protected by ethical guidance than by law. Biggs further suggests that *‘Obtaining the assent of those who lack the legal capacity to give valid consent is an important acknowledgement of their individual autonomy and self-determination’* and notes that if a minor is not able to provide legal consent, parental consent should only be sought and be seen to be legal when a child’s assent is in place. Considering this, it is a welcome sign that assent is now included in the national standard REC application form.

### **Ethical conditions and effect on data collection**

The second condition imposed on the study was the requirement to use only published hedonic symbols [13]; as they were *‘valid and reliable’*.

For the study a schedule of questions and pictures relating to food was developed; the food pictures used were a collection gathered from Microsoft Clip Art, specifically for this study. The researcher met with a small group of three to four children (for whom ‘two-parent consent’ had been obtained) in their settings. Children were not taken from their pre-school room, but were asked to move as a group to one side of the room and

asked to give their verbal assent to take part in the exercise. When in the group with the researcher, the children were shown the pictures of different foods and food situations, questions about the pictures were asked, and children requested to point to hedonic symbols [13] to answer the questions.

When the first picture of food was shown to the children in the group situation and they were asked the first question about this picture, it became apparent to the research dietitian that the children were unable to relate their feeling about the food picture they were being shown to the hedonic symbols they had been given.

After a number of unsuccessful attempts, the researcher then asked the children to point to the hedonic symbols and asked them what they thought each symbol portrayed. It became apparent that the children's perceptions of the symbols were at odds to that which had been outlined in the literature [13]. Table 2 outlines the children's responses in this study, and the description given by American children, of similar age, in the study carried out by Chen et al [13].

**Table 2 Hedonic symbols; literature and children's explanation**

Hedonic symbol description in literature [Chen et al, 1996]	Children's interpretation in this study
'super bad'	'bold*'; 'sad'; 'mad'; 'cross?'; 'happy'
'bad'	'sad'; bored'; 'don't know'; 'full'
'maybe good or maybe bad'	'grumpy'; 'happy'; 'tonking'; 'sad'
'good'	'happy'
'super good'	'Sad'; 'more happy'; 'why are there two happy faces?'

\*'bold' in the Republic of Ireland is commonly used to mean 'naughty'

The inclusion of the published symbols may have had a negative impact on the children's understanding of the study methodology, especially as the pilot pre-study demonstrated that the use of developmentally appropriate symbols led to a successful outcome, with children of this age correctly recognising the symbols. There is a need to

recognise that tools that may be shown to be correct for use in a certain context may not be the most appropriate tools if used in a different scenario. While the researcher submitted Microsoft Clipart symbols with the REC application, it became clear through two rounds of correspondence with the REC on this issue that they required that only validated symbols were to be used.

Fine and Sandstrom [23] have noted there are challenges to creating research tools for use with pre-school aged or pre-literate children; perhaps it is for this reason that the REC felt that a pre-published instrument may yield better results than something created at a local level.

The poor outcome of this study, however, does not reflect badly on the hedonic symbols from the literature that were used. The inability to collect data in this study, with a tool developed for research carried out in another country, more than a decade previously, is quite unsurprising, and rather than the researcher challenging the published literature, this result should further add to an information base which recommends the need to have situation specific tools with which to work with young children, to enable them to narrate their story [23]. Moreover, it is important that specific research applications for work with minors be dealt with by RECs on an individual basis, especially if there are no recent studies of similar nature within the same cultural context.

### **Approaching RECs regarding ethical constraints imposed**

In retrospect, it may have been possible to consider the ethical conditions prescribed and predict the type of problems that might be encountered when endeavouring to undertake the study under these ethical constraints. However, as Dixon-Woods et al [9] suggests *‘the proper role of applicants is one of docility; in responding to letters they must make displays of obedience and deference. In particular, unless they are to resort to the*

*appeals mechanism, applicants are obliged to accept judgements which are inherently contestable and indeterminate as incontestable and final.*' Dixon-Woods et al also note that applicants' hands are effectively tied when it comes to receiving REC letters with recommendations as to disagree would mean taking a huge risk of an unfavourable ethical opinion.

Perhaps, if there had been the opportunity to discuss the ethical issues raised by the REC in a face to face interview, this may have helped to allay the concerns of the REC and, therefore, may have resulted in a different endpoint with regard to this study. It would appear that there is the possibility to do this in the UK; Dixon-Woods et al [9] note that researchers may now attend REC meetings and that this can have an influence which may be seen in subsequent REC decision letters.

Perhaps this facility is also possible in an Irish context; however, this possibility is not clearly evident. In this study, all correspondence with the REC was by postal letter. It is interesting to note that even within the new national standard application guidance manual [22], there does not appear to be any information on how a REC can be approached in a face to face manner to discuss its decisions.

## **Conclusion**

With increased numbers of children spending much time in early years' settings, it is important children are consulted regarding the potential impact of this on their food intake and preferences. There is a dearth of studies focusing on the VOC in this age group and no study could be found which aimed to ascertain perceptions of food among children of this age group. Although this study took place in Ireland, the lack of published literature in this area probably indicates that this may be an issue on a wider scale.

It was agreed that the limitations of the final sample and the poor response to the hedonic symbols rendered the results from this element of the study invalid. Little meaningful data were obtained from this study, which is hugely disappointing. However, it is important to delve into the ethical issues that surround research with children. Gathering an understanding of the issues of consent and assent, and contemplating the importance of developing age and culturally appropriate information collection tools, is very important to equip those who hope to undertake such research in the future. Researchers should be cognisant that the important need to maintain strict ethical standards must be balanced with the need to give due regard to determining the child's voice in research.

### **Acknowledgements**

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### **Competing interests**

None of the authors have any conflicts of interest to declare.

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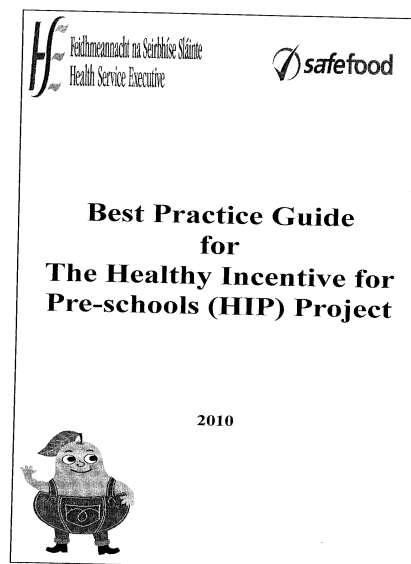
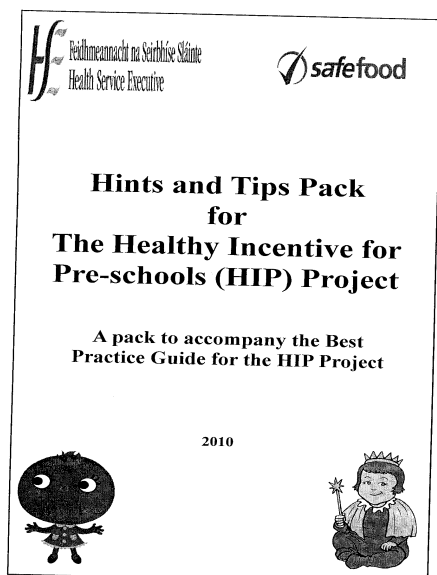
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## Appendix 25

Education Resource Pack consisting of 'Hints and Tips Pack' and 'Best Practice Guide'



*\*An electronic version of this resource is available from the Community Nutrition and Dietetic Service, Health Service Executive Dublin Mid-Leinster (Midland Area): email: [community.dietitians@hse.ie](mailto:community.dietitians@hse.ie).*



## Appendix 26

### Delphi technique: Letter to accompany round one Delphi questionnaire



#### 'HIP (Healthy Incentive for Pre-Schools) Project'

Charlotte Johnston Molloy, Senior Community Dietitian,  
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Marlinstown Office Park,  
Mullingar, Co. Westmeath.

Tel: 044 93 53220/ Mob: 086 6012160/ email: [charlotte.johnston@hse.ie](mailto:charlotte.johnston@hse.ie)

2<sup>nd</sup> December 2011

#### Re. Incentive information – the Delphi questionnaire

Dear

I have just completed my visits to all pre-school services in the HIP project – there are now 45 full day care pre-schools participating in the project across counties Laois, Offaly, Longford and Westmeath. Well done to everyone for their participation. It has been great to visit you all and to see all the very positive work that is being carried out.

I apologise for the delay in feeding back to those of you whom I have visited this autumn. I will get back to you as soon as is possible; now that I have finished all pre-school site visits.

I hope you have all had your 'thinking caps' on since my last visit!

I now enclose a '**Delphi 1**' questionnaire and a '**Stamped Addressed Envelope (SAE)**'. The '**Delphi questionnaire information sheet**' enclosed will explain how to fill in the '**Delphi 1**' questionnaire. It will also explain the next steps in this information gathering process.

Through the '**Delphi**' questionnaires we hope to gather information on what you think would be an important incentive for pre-schools to take part in the HIP project. So please write down all your ideas and send them back to us.

I would be very grateful if you could complete the '**Delphi 1**' questionnaire and return it to me in the SAE by the 14<sup>th</sup> December.

Looking forward to hearing all your ideas,

If you have any questions about this, please contact me on 086 6012160 / 0449353220 / [community.dietitians@hse.ie](mailto:community.dietitians@hse.ie)

Best regards,  
Charlotte  
(Senior Community Dietitian with the HIP project)



## Appendix 27

### Delphi technique: round one - explanation sheet



### The Healthy Incentive for Pre-schools (HIP) Project Delphi questionnaire information sheet:

#### Identification of a suitable incentive for the ‘Healthy Incentive for Pre-schools’ (HIP) Project

The team with the HIP project are very keen to learn about the types of incentives that would be useful and attractive to pre-school managers, and that would encourage pre-schools continue to be part of the HIP project.

We will be sending you a series of questionnaires, called Delphi questionnaires:

Delphi 1: This first questionnaire will ask you to outline the incentives that you think would be useful to you as a pre-school manager.

Delphi 2: Your responses will then be gathered with that of other managers and you will get the chance to see other managers’ responses (which will be anonymous) and you be asked to grade these responses (from very important to unimportant).

Delphi 3: Finally you will be given the chance to see how other managers grade the ‘incentive ideas’ and you may, or may not, at this point change your mind with regard to your response.

Your opinion on the type of incentive that will become part of the HIP project is very important to us; if you have any questions about this please just ask.....

**Please complete the enclosed Delphi 1 questionnaire and return to me in the enclosed ‘Stamped Addressed Envelope’ by the 14<sup>th</sup> December 2011.**

**I very much look forward to getting your ideas.**

Best regards,

Charlotte  
Community Dietitian with the HIP project

**(086 6012160 / 044 93 53220 / [community.dietitians@hse.ie](mailto:community.dietitians@hse.ie))**

## Appendix 28

### Delphi technique: round one – questionnaire

#### Delphi questionnaire: Round 1

#### Identification of a suitable incentive for the 'Healthy Incentive for Pre-schools' (HIP) Project

#### Delphi Round One

Please list your answers to the following question. You may list as many answers as you wish and they do not have to be in any particular order.

**Question:** As manager of a full day care pre-school, what incentives would you choose for the Healthy Incentive for Pre-schools (HIP) project that would make the HIP project more attractive to you as a manager?

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## Appendix 29

### Delphi technique round two: letter



### The Healthy Incentive for Pre-schools (HIP) Project DELPHI Questionnaires (Round 2):

#### Identification of a suitable incentive for the 'Healthy Incentive for Pre-schools' (HIP) Project

Dear Participant,

Thank you very much for taking the time to complete the **first round** of the **DELPHI Questionnaire** which was sent to you before Christmas.

Please find enclosed the **second round of the DELPHI Questionnaire** process. This questionnaire contains all the suggestions for the incentive scheme; these suggestions were made by all pre-school providers in the HIP project.

We would like you to take a look at the suggested incentives and rank them on the form provided (**ranging from Very Unimportant to Very Important**). This will help us to come to a better understanding of what would be **most helpful** to the majority of pre-school providers.

**Your opinion is extremely important to us** so please do have a look at the suggested incentives and let us know what you think.

If you have any questions about this DELPHI Questionnaire please give me a call.

**Please complete the enclosed DELPHI (Round 2) questionnaire and return to me in the enclosed 'Stamped Addressed Envelope' by the 2<sup>nd</sup> April 2012.**

**We very much look forward to getting your ideas.**

Best regards,

Charlotte  
Community Dietitian with the HIP project

(086 6012160 / 044 93 53220 / [community.dietitians@hse.ie](mailto:community.dietitians@hse.ie))

**Appendix 30**  
**Delphi technique: round two questionnaire**



Code: \_\_\_\_\_

**DELPHI Questionnaire (Round 2)**

**Identification of a suitable incentive for the ‘Healthy Incentive for Pre-schools’ (HIP) Project**

Dear participant,

For each statement, please place an **X** in the box which you feel best describes how helpful the suggested incentive would be to you. These numbers match to a response as below:

- 1 = Very Unhelpful
- 2 = Quite Unhelpful
- 3 = Neither
- 4 = Quite Helpful
- 5 = Very Helpful

<b>Incentive priority:</b>					
1. Very Unhelpful 2. Quite unhelpful 3. Neither 4. Quite helpful 5. Very helpful	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1. Crèche resources</b>					
1.1. Recipes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2. Menu ideas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3. Ideas for budget meals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4. Short snappy regular health related information from the HIP Project, i.e. regular newsletter.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5. Meal chart that would show exactly what is required for each meal in terms of food groups.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6. Help and advice from dietitian in the HIP Project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7. Feedback on progress in the HIP Project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8. To have dedicated outside support person to ask advice / answer queries, e.g. HIP Support Worker.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Incentive priority:</b>	
1. Very Unhelpful 2. Quite unhelpful 3. Neither 4. Quite helpful 5. Very helpful	1 2 3 4 5
1.9. To have dedicated HIP Project Team Leader within the pre-school service to answer any queries and to lead the project in-house.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.10. A once off demonstration of portions sizes, food groups.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.11. An ongoing series of demonstrations of portion sizes, food groups.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.12. Networking of contact details of other services to share experience & advice in relation to the HIP Project.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.13. Specific steps on feedback form to encourage achievement of the next award level of the HIP Project.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.14. A once off demonstration on preparing foods.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.15. An ongoing series of demonstrations on preparing foods.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.16. Set of simple guidelines re. Dietary best practice.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1.17. Sharing experiences / information between crèches on menus i.e. snacks & teas.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>2. Supports for staff</b>	
2.1. A once off workshop for staff (and chef) on menu planning.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.2. An ongoing series of workshops for staff (and chef) on menu planning.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.3. Once off HIP Project training / information sessions for staff.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.4. HIP Project training sessions on continuous basis for staff.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.5. Practical tips for staff on feeding issues such as fussy eating.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.6. Workshops for staff to help initiate the HIP Project.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.7. An information pack to help providers understand level of	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

standard expected of them in the HIP Project.	
<b>Incentive priority:</b>	
<b>1. Very Unhelpful 2. Quite unhelpful 3. Neither 4. Quite helpful 5. Very helpful</b>	<b>1 2 3 4 5</b>
2.8. Templates & directions for healthy eating lesson planning.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.9. More HIP Project books.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.10. Mentoring hours as a support provided by HIP Project Support Worker.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.11. Mentoring hours as a support provided by in-house HIP Project Team leader within the pre-school service.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2.12. HIP Project certificates for staff.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>3. Supports for children</b>	
3.1. More healthy eating / physical activity literature for walls and rooms.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.2. Toys related to healthy eating: play food, puzzles and games.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.3. Children's books and colouring books on healthy eating.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.4. National healthy eating day for pre-school children to taste different foods.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.5. Colourful and child friendly menu charts for children.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.6. HIP Project stickers for children.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.7. DVDs / videos / posters / songs on healthy food for children.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.8. Talk / demonstrations for children on healthy eating / physical activity.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.9. HIP Project placemats for tables.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.10. Health education resources i.e. 3D model of the digestive system.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.11. Sample foods and rewards to bring home similar to Food Dude Scheme.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

3.12. HIP Project certificates for children.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Incentive priority:</b> 1. Very Unhelpful 2. Quite unhelpful 3. Neither 4. Quite helpful 5. Very helpful	<b>1 2 3 4 5</b>
<b>4. Supports for parents</b>	
4.1. Advertising and communication tools for parents to raise HIP Project profile with parents, e.g. HIP Project newsletter.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.2. HIP Project ‘parent information stand’ for hallway to promote the project and nutrition & physical activity.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.3. HIP Project talks / demonstrations / information sessions for parents provided by HIP Project Support Worker.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.4. Healthy eating talks / demonstrations / information sessions for parents provided by HIP Project Support Worker / Dietitian.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.5. Handouts on HIP Project for parents in different languages, i.e. Polish, Russian and Chinese.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.6. Education for parents in how to make healthy lunchboxes.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>5. Recognition for pre-school services / crèches</b>	
5.1. HIP Project recognition for service i.e. something such as plaque for the wall to let everyone know the work that has been done.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.2. HIP Project certificate for service.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.3. HIP Project recognition in newsletters such as the County Childcare Committee or Triple P newsletter.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.4. HIP project certificate for service, staff and children.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.5. Healthy eating / physical activity resources for parents, e.g. leaflets, brochures.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.6. Quality mark to distinguish service from other services that aren’t involved in HIP Project.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>



<b>Incentive priority:</b>	
1. Very Unhelpful 2. Quite unhelpful 3. Neither 4. Quite helpful 5. Very helpful	1 2 3 4 5
5.7. Award provided would be a 'culture' type piece, e.g. statue or design piece.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.8. HIP Project recognition for participating services in local media.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.9. HIP Project Awards for healthy eating policies.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.10. Publicity from HSE HIP Project for pre-schools participating in project.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>6. Funding / grants for crèches</b>	
6.1. Funding to help with the cost of food for a healthy menu.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6.2. Extra funding / grants to promote healthy eating and physical activity.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6.3. Funding towards helping parents learn about making healthy meals, i.e. nutrition and cookery course for parents.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6.4. Link with local enterprise for incentive provision, i.e. locally produced yoghurts at subsidised price.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6.5. Grants for healthy drinks e.g. milk.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6.6. Vouchers for fruit & vegetable shops.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6.7. Equipment that promotes healthy nutrition and physical activity, i.e. smoothie maker; play equipment.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

## List of Publications

This list refers to all publications and presentations arising from work carried out in the course of the research outlined in this thesis.

### Publications

Johnston Molloy C, Murtagh M, Corish CA, Kearney J & Glennon C (2007) An exploration of food provision, and commitment to the introduction of a nutrition incentive scheme, in the pre-school setting. *Proc Nutr Soc* **66**, 109A.

Molloy CJ, De Siún A, Kennelly S & Slattery CG (2007) A study to determine the view of Irish pre-schools, on the use of a scored evaluation form as a motivational tool, to improve food provision in this setting. *J Hum Nutr Diet* **20**, 382.

Johnston Molloy C, Corish C, Kearney J, Hayes N & Glennon Slattery C (2010) Letters to the Editor. *J Hum Nutr Diet* **23**, 426-427.

Johnston Molloy C, Corish C, Kearney J, Hayes N & Glennon Slattery C (2011a) Developing a nutrition assessment tool for Irish pre-schools. *Nutrition & Food Science* **41**, 44-53.

Johnston Molloy C, Corish C, Kearney J, Hayes N & Glennon Slattery C (2011b) Fluid provision in the Irish full day care pre-school setting. *J Hum Nutr Diet* **24**, 290-291.

Johnston Molloy C, Corish C, Kearney J, Hayes N & Glennon Slattery C (2011c) An observational study in Irish full day care pre-schools to determine nutrition practice. *Proc Nutr Soc* **70**, E109.

Johnston Molloy C, Hayes N, Kearney J, Glennon Slattery C & Corish C (2012) Researching young children's perception of food in Irish pre-schools: An ethical dilemma. *Research Ethics* **8**, 155-164.

Johnston Molloy C, Kearney J, Hayes N, Glennon Slattery C & Corish C (2013) Pre-school manager training: a cost-effective tool to promote nutrition- and health-related practice improvements in the Irish full-day-care pre-school setting. [Accepted for publication, *Public Health Nutrition*].

### Oral presentations

An exploration of the feasibility of a healthy food incentive scheme in the pre-school setting. **3rd International Consumer Sciences Research Conference: Improving**

**Consumer Skills – Improving Consumer Choice. University of Ulster, Jordanstown, Northern Ireland, June 27-29, 2007.**

An exploration of food provision, and commitment to the introduction of a nutrition incentive scheme, in the pre-school setting. **Nutrition Society Research Meeting, University of Ulster, Coleraine, Northern Ireland, June 16-19, 2007.**

The HIP (Healthy Incentive for Pre-schools) Project: Results of a pilot assessment of pre-school nutrition practices in full day care Irish Pre-schools. **‘Closing the gap in child and adolescent health: the settings approach’, Health Promotion Conference, National University of Ireland, Galway; Republic of Ireland, June 11-12, 2009.**

Barriers to the determination of the 'Voice of the Child' in the Irish full day care pre-school setting. **20th European Early Childhood Education Research Association Conference 'Knowledge and voice in early childhood: who knows, who speaks, who listens?' University of Birmingham, Birmingham, United Kingdom, September 6-8, 2010.**

Young children's eating; it's child's play. **‘What now for Children?’ National Children's Nursery Association / Irish Pre-school Play Association National Conference, Royal Hospital Kilmainham, Dublin, Republic of Ireland, April 9, 2011.**

The Irish pre-school – a setting for the promotion and evaluation of nutrition and health related practice. **3<sup>rd</sup> Annual Postgraduate Research Symposium, Dublin Institute of Technology, Dublin, Republic of Ireland, November 6, 2012.**

The development, validation and implementation of an healthy food incentive scheme in the Irish pre-school setting: HIP (Healthy Incentive for Pre-schools) Project'. Update presentations. **1st – 10th biannual national meetings of the Pre-school Nutrition Project Advisory Committee, Safefood, Dublin, Republic of Ireland, March 2008 – October 2012.**

### **Poster presentations**

A study to determine the view of Irish pre-schools, on the use of a scored evaluation form as a motivational tool, to improve food provision in this setting. **British Dietetic Association's Annual Conference, Belfast, Northern Ireland, June 19-21, 2007.**

Fluid provision in the Irish full day care pre-school setting. **The British Dietetic Association's 'Research Symposium for Dietitian's new to research' University of Ulster, Jordanstown, Northern Ireland, March 15, 2011.**

An observational study in Irish full day care pre-schools to determine nutrition practice. **Nutrition Society Research Meeting, University of Cork, Cork, Republic of Ireland, June 15-17, 2011.**

### **Unpublished reports**

**Johnston Molloy C & Glennon Slattery C (2012) The HIP (Healthy Incentive for Pre-schools) Project.** The development and validation of a nutrition evaluation tool and nutrition and health information resource for the full day care pre-school setting in the Republic of Ireland, to promote an improved nutrition and health environment and food provision and healthy practice in this setting. Supported by *safefood*, the Food Safety Promotion Board, under Grant No. [*safefood* Grant No. 01-2008]; in association with the Health Service Executive, Ireland.

### **Other**

Johnston Molloy C (2010) *Food atlas of serving sizes of common foods for pre-school children (1-5 years)*, Dublin, safefood.

‘Pre-school pupils fail to make a meal of it’. **Sunday Times Newspaper article, February 27 2011.**