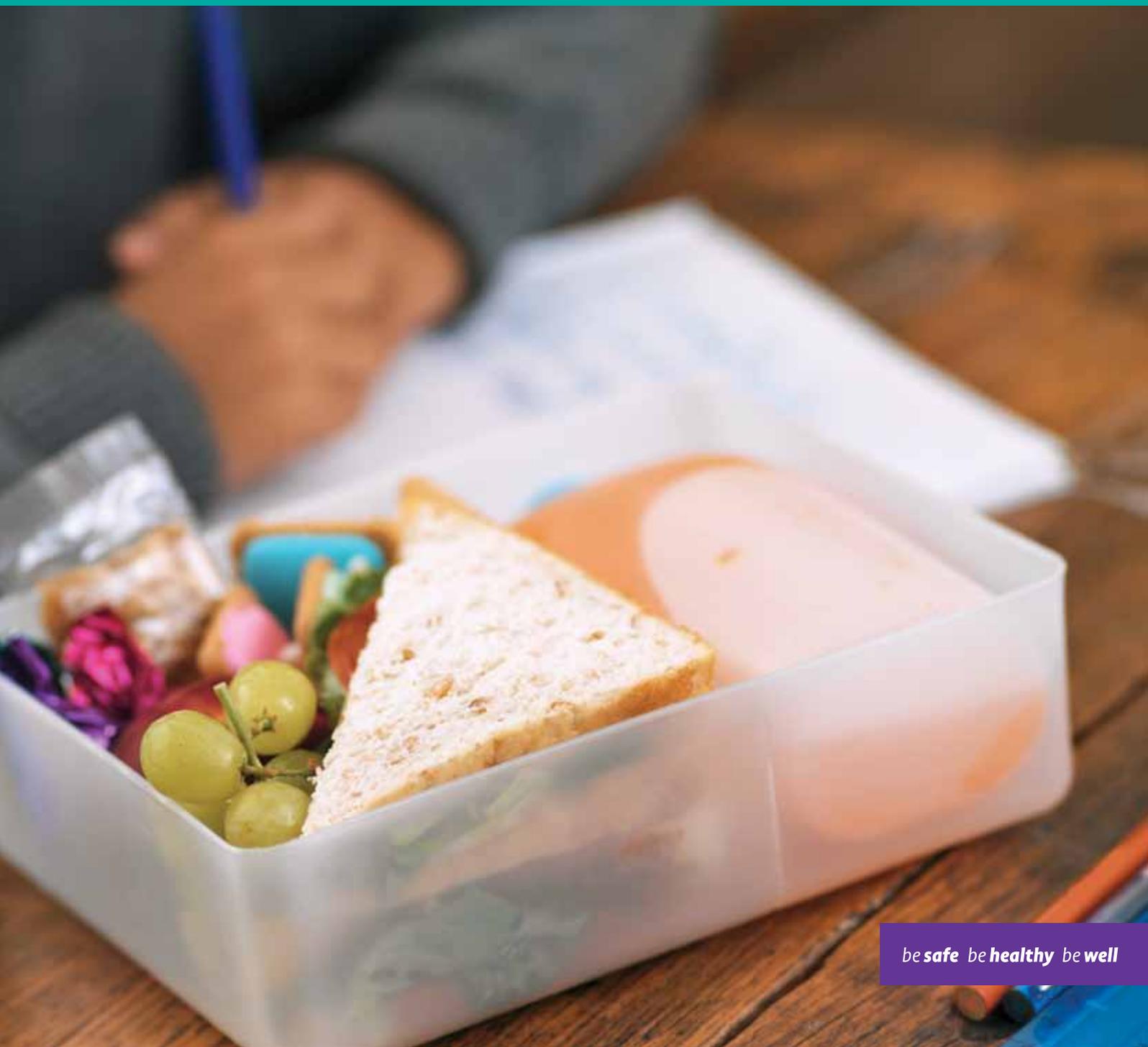


Body weight and eating habits in 5-12 year old Irish children

The National Children's Food Survey

Summary Report



Body Weight and Eating Habits in 5-12 year old Irish Children

The National Children's Food Survey

Summary Report

Publication date: May 2011

ISBN: 978-1-905767-17-5

Table of Contents

List of Tables	6
List of Figures	7
Acknowledgements	9
Foreword	11
Introduction	13
Methodology	16
Key Findings	16
Conclusion	23
Recommendations	26
Appendix 1	28
Appendix 2	29
Appendix 3	30
References	31

List of Tables

Table 1	Data gathered in the National Children’s Food Survey (NCFS)
Table 2	Percentages of boys and girls aged five to 12 years with body weights classified as a healthy weight, overweight and obese (NCFS, 2005)(8)
Table 3	Comparison of average (standard deviation) weight in kilograms (kg), height in centimetres (cm) and BMI in boys and girls aged eight to 12 years in 1990 (INNS, 1990) and 2005 (NCFS, 2005) (8)
Table 4	Average screen time watched by children in different weight categories during school term and school holidays
Table 5	The average amount of screen time viewed on weekdays and weekends during school term by children with the least healthy diets compared to children with the healthiest diets

List of Figures

- Figure 1 Percentages of boys and girls aged eight to 12 years with body weights classified as overweight and obese in 1990 (INNS, 1990) and 2005 (NCFS, 2005)(8)
- Figure 2 Percentages of parents who agree or disagree with the statement ‘Do you think your child’s weight is OK for their age?’ according to the weight categories (healthy weight, overweight and obese) of children

Acknowledgements

Summary report was prepared by **safefood** and the **Health Service Executive** and is based on research by:

Máiréad Kiely¹, Anne Nugent², Jennifer O'Neill², Janette Walton¹, Darina Sheehan¹, Jackie Murnane¹, Dr Áine McConnon², Sinéad McCarthy^{2,3}, Albert Flynn¹, Michael Gibney².

Research funded by **safefood** and the **Health Service Executive**.

¹ Department of Food & Nutritional Sciences,
University College Cork (UCC), Cork.

² Institute of Food and Health, University College
Dublin (UCD), Belfield, Dublin 4.

³ Current address: Ashtown Food Research Centre
(AFRC), Teagasc, Dublin.



Foreword

A shared goal of **safefood** and the **Health Service Executive (HSE)** is to improve the health of the Irish population. One of the greatest public health threats facing all developed countries today, including the island of Ireland, is obesity. It is crucial that the various sectors and disciplines in the country work together to successfully deal with this growing issue.

The Department of Health and Children (DoHC) published a strategy for obesity in 2005 which identified children and young people as a vulnerable, at-risk group. Both **safefood** and the **HSE** recognise the growing trend towards obesity, physical inactivity and unhealthy dietary habits in Ireland. Both organisations have been actively engaged in addressing the obesity epidemic. A number of initiatives targeted at school-aged children have already been established. These include the 'Little Steps' mass media campaign (www.littlesteps.eu) – a campaign aimed at supporting parents/guardians of children, as well as various school-based initiatives and relevant training programmes for health professionals.

safefood and the **HSE** are keen to ensure that our policies and programmes to address the wellbeing of children are based on robust, up-to-date and accessible evidence. The National Children's Food Survey (NCFS) was carried out by nutritional scientists at University College

Cork and University College Dublin (www.iuna.net) in 2005 and was funded by the Department of Agriculture, Fisheries and Food. Following the launch of the preliminary findings, **safefood** and the **HSE** recognised the potential of this NCFS database and commissioned analysis specifically exploring the factors associated with a healthy weight and a healthy diet among Irish children. This initiative also meets the DoHC National Children's Strategy goals of helping to ensure children's lives are better understood through research.

The key finding that the home environment plays a central role in both children's weight and diet highlights the need to support parents and guardians in providing a healthy lifestyle for their family. The NCFS results are relevant to those working in areas dealing with obesity, physical activity and food & nutrition - for example those working in government departments and agencies, healthcare bodies, professional bodies, non-governmental agencies, community groups, academia and industry. They are also of relevance to parents and guardians. Supporting children to develop their full potential where they live, learn and play remains one of our key priorities.



Introduction

“Children have the right to *life, survival and development*” (1). Essential to this right is the opportunity to live a healthy lifestyle and to develop healthily. A combination of a nutritious diet, physical activity and the maintenance of a healthy body weight¹ will support children in achieving their personal potential and living long, fulfilled and good quality lives. Children are particularly vulnerable to the effects of excess body weight, poor diet and physical inactivity. This is because as they are growing and developing they are reliant on the support of others, i.e. parents/guardians for their basic needs. They are also likely to carry the habits they form in their childhood into adulthood.

Many children today may not achieve their personal potential but rather will be burdened with ill-health due to obesity, poor quality diet and physical inactivity. These factors are contributing to the development of chronic diseases such as high blood pressure and Type 2 diabetes in Irish children (2-4). Such diseases are major causes of early death and poor health in adults in Ireland.

1 Healthy weight – refers to a body weight that is healthy for a person’s height.

Although these chronic diseases usually appear in adulthood, they can have their origins in childhood. The psychological effects of being overweight² or obese³ on our health and well-being must also be recognised - low self-esteem, effect on mental health, experiences of bullying and discrimination.

safefood and the **HSE** are concerned that these trends will see many of the children of today living shorter and poorer quality lives than their parents due to greater levels of ill-health. To ensure that Irish initiatives that promote and protect health and well-being are effective, they must be evidence based. It is therefore essential that relevant, up-to-date Irish information is available in this area. The National Children’s Food Survey (NCFs) provides some valuable insights into the factors that promote the obesity epidemic in our society.

2 Overweight – refers to when a person is carrying some excess body weight that could put them at risk of poor health.

3 Obese – refers to when a person is carrying excess body weight for their height, which puts their health at serious risk and increases the likelihood of poor health and disease.

Children have the right to life, survival and development



The NCFS was carried out on a nationally representative sample of 594 Irish children (293 boys and 301 girls) aged five to 12 years during 2003 and 2004. Detailed information on food and drink consumption, levels of physical activity, body measurements, socio-economic, attitudinal, health and lifestyle information were collected from both children and parents/guardians (Table 1).

Initial results from the NCFS were launched in 2005 (published at www.iuna.net) and showed that more than one in five (22 per cent) of children aged five to 12 years were carrying excess body weight (5). Worryingly, this represents approximately a two fold increase in the number of overweight *and obese* children in the 15 years since the last nationally representative data was collected. Children are living in homes where three in five Irish adults are overweight or obese (66 per cent of men and 54 per cent of women)(6). The NCFS also highlighted low fruit and vegetable intakes and high intakes of fat and salt among many children, as well as low intakes of certain key nutrients such as calcium and iron, which are essential for healthy growth and development, particularly among girls. High levels of TV viewing were also evident, which suggests missed opportunities for being active.

Despite a perception to the contrary, this survey found that almost 90 per cent of a child's food intake (i.e. 90 per cent of total energy or calorie intake) originated in the home. This, along with emerging associations between parental influences and children's body weight, physical activity levels and diet, places the home environment and the family at the centre of activities to promote health and well-being in five to 12 year olds. This analysis sought to further explore the factors associated with healthy weight and healthy nutritious diets in the Irish children studied.

*...more than one in five (22 per cent)
of children aged five to 12 years
were carrying excess body weight...*



Table 1 Data gathered in the National Children's Food Survey (NCFS)

Food and drink intake: seven day weighed diary; quantitative food and nutrient intake data on each food and beverage item consumed over seven days in child, including nutritional supplements

Socio-demographic factors (of parents):

Education
Social class
Marital status
Geographic location of family home

Children's health and lifestyle factors:

Anthropometry: height, weight, body mass index (BMI)⁴, waist circumference (measured data)
Physical activity - at home, school and recreational
TV viewing (hours/day)
Childcare
Birth weight and infant feeding practices
Eating habits and attitudes to food
Body image, awareness of body weight and dieting practices

Parent's health and lifestyle factors:

Parental anthropometry: height, weight, BMI, waist circumference (measured data)
Physical activity - at home, work and recreational

Attitudinal factors/beliefs:

Child's attitude to food, nutrition and health (nine to 12 year olds)
Parent's beliefs about the relationship between nutrition and health
Parent's attitudes to their child's diet
Barriers to providing a healthy diet
Parent's attitudes to their child's body size and weight
Validated eating behaviour questionnaires in parents and children

4 BMI is a measure to assess whether a child or adult is carrying excess weight that puts health at risk. An individual's weight and height are measured and used to calculate an individual BMI which determines normal/healthy weight, overweight or obesity. For children, age and gender specific reference information must be used.

Many children today may not achieve their personal potential but rather will be burdened with ill-health due to obesity, poor quality diet and physical inactivity.

Aim of the further analysis of the NCFS data

The aim of this analysis was to identify whether family, home, school, attitudes, beliefs or diet influence the likelihood of a child being a healthy weight or having a health promoting diet. A deliberate focus on ‘healthy weight’ and ‘healthy eating’ was taken in this work so that the outputs of the research would be practical and support the health promotion activities and initiatives of the **HSE** and **saferfood**.

Methodology

The NCFS database was examined using a variety of statistical approaches⁵.

1 Determinants of a healthy weight

The UK 1990 BMI reference curves and cut-off points for boys and girls (7) were used to divide the BMIs of the children into weight categories – healthy weight, overweight and obese⁶. These charts defined overweight as having a BMI between the 91st and 98th percentile and defined obesity as a BMI on or above the 98th percentile. Dietary, lifestyle, socio-economic and behavioural variables were compared across these weight categories and predictors of being a healthy weight or overweight were identified. The body weight and height data of both the children and parents/guardians were based on actual measurements taken and were not self-reported data.

2 Determinants of a healthy diet

Dietary quality was measured by two approaches:

1. The Healthy Eating Index (HEI; Appendix 1) is a tool used to numerically measure the healthfulness of the diet and to identify foods ‘positively’ or ‘negatively’ associated with a healthy diet.
2. Compliance with specific recommendations for intakes of fruit and vegetables, dietary fibre and salt (Appendix 2). In the absence of specific food and nutrition guidelines for children in Ireland, relevant evidence based international guidelines were selected (Appendix 2). Age specific estimated average requirements (EARs⁷) were used as cut-off points to estimate the proportion of the population with inadequate vitamin and mineral intakes (Appendix 3).

Key findings

Body weight of Irish children

- One in five boys (20 per cent) and one in four girls (25 per cent) were carrying excess weight, the body weight of the children being classified as overweight or obese (Table 2).

5 More information on methods and results can be requested directly from the researchers.

6 Obesity is an excessive accumulation of body fat and is associated with increased risk of illness, disability, and death.

7 EAR is the amount of a nutrient expected to meet the needs of an age specific population group.

Table 2 Percentages of boys and girls aged five to 12 years with body weights classified as a healthy weight, overweight and obese (NCFS, 2005)(8)

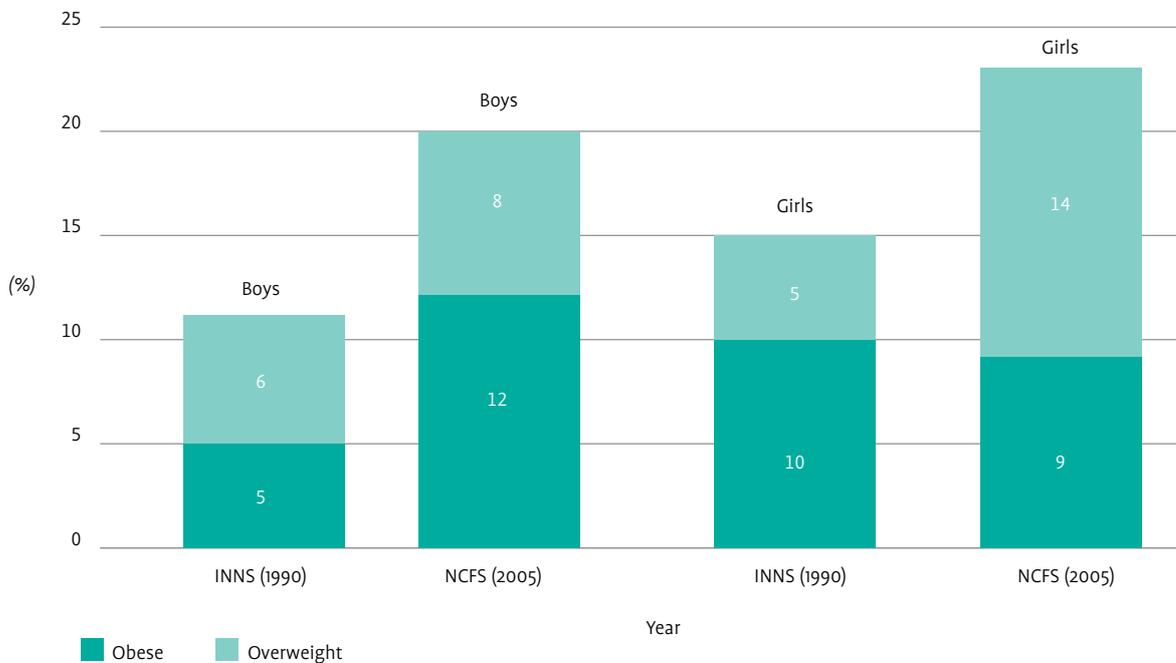
Weight Category	Boys (%)	Girls (%)
Healthy Weight	80	75
Overweight	11	12
Obese	9	13

- In the past 15 years, Irish children aged eight to 12 years have become heavier (Table 3). The body weight data from the NCFS survey was compared with data from the last Irish survey that measured body weight data in children in 1988/89, the Irish National Nutrition Survey (INNS) (9). The data could only be compared for the age group eight to 12 years as INNS did not study children aged five to seven years (Figure 1). The greatest weight increase was seen in the overweight category for boys - the numbers of boys classified as overweight has more than doubled (five per cent to 12 per cent). For girls, the greatest weight increase was seen in the obese weight category - the numbers of girls classified as obese has almost tripled (five per cent to 14 per cent), (Figure 1)(8). Table 3 Comparison of average (standard deviation) weight in killograms (kg), height in centimetres (cm) and BMI in boys and girls aged eight to 12 years in 1990 (INNS, 1990) and 2005 (NCFS, 2005) (8)

Table 3 Comparison of average (standard deviation) weight in killograms (kg), height in centimetres (cm) and BMI in boys and girls aged eight to 12 years in 1990 (INNS, 1990) and 2005 (NCFS, 2005) (8)

	Boys 1990	Boys 2005	Girls 1990	Girls 2005
Weight (kg)	34.1 (7.1)	37.0 (9.3)	34.7 (8.3)	39.4 (12.2)
Height (cm)	139.8 (8.4)	141.9 (10.1)	139.2 (8.9)	142.1 (10.9)
BMI (kg/m ²)	17.4 (2.9)	18.1 (2.8)	17.7 (2.6)	19.1 (3.8)

Figure 1 Percentages of boys and girls aged eight to 12 years with body weights classified as overweight and obese in 1990 (INNS, 1990) and 2005 (NCFS, 2005)(8)



Factors associated with a healthy weight in Irish children

- Parents who had a higher BMI and waist circumference were more likely to have children with a higher BMI and waist circumference. Thus, if parents were overweight their children were also more likely to be.
- Overweight and obesity occurred in all social classes and across all levels of education. The current analysis showed no consistent trends between the education status or social class of parents and BMI or waist circumference of the children.

- The more time children spent watching TV, the more likely they were to be overweight or obese and the more likely they were to have a greater BMI and waist circumference. On average, children who were a healthy weight watched 30 minutes less television per day than children who were overweight or obese (Table 4).

Table 4 Average screen time watched by children in different weight categories during school term and school holidays

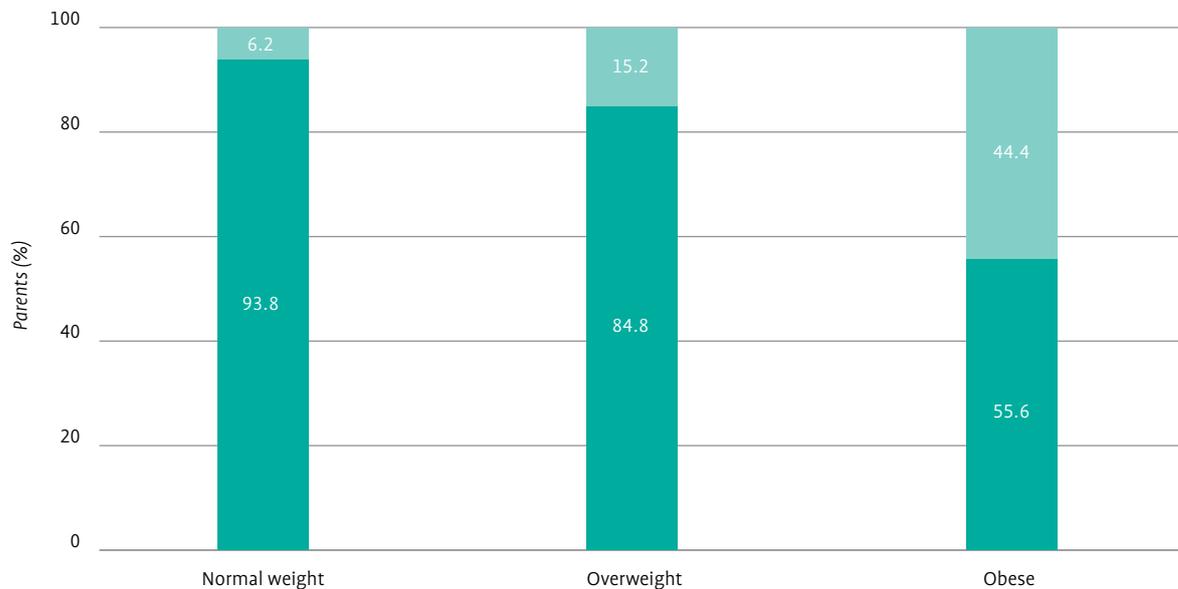
	Healthy weight	Overweight	Overweight
School term			
TV viewing Hours/day	2.0	2.2	2.4
Computer games Hours/day	0.6	0.6	0.7
School holidays			
TV Viewing Hours/day	2.5	3.0	3.1
Computer games Hours/day	1.0	1.1	1.1

- In this analysis, most children consume most foods, so no ‘candidate’ foods to avoid being overweight emerged. There were only minor differences in food consumption between the three weight categories, both in terms of the percentage of children consuming a particular food group and the average intake among children consuming the particular food.
- Parents and children’s perception of their own weight relative to the healthy weight ranges varied:
 - A significant proportion of parents were unable to identify when their own child was not a healthy weight: more than four in five parents (85 per cent) who had children who were overweight, and more

than one in two parents (56 per cent) who had children who were obese believed their child’s weight was fine for their age. This may reflect a difficulty by parents in correctly assessing whether their own child is carrying excess body weight.

The more time children spent watching TV, the more likely they were to be overweight or obese and the more likely they were to have a greater BMI and waist circumference.

Figure 2 Percentages of parents who agree or disagree with the statement ‘Do you think your child’s weight is OK for their age?’ according to the weight categories (healthy weight, overweight and obese) of children



- Many children who were overweight and/or their parents were drinking diet beverages and/or eating wholemeal bread. This could be interpreted as evidence that they were being conscious of being overweight and were trying to address this. Forty-six per cent of children who were overweight reported trying to lose weight, compared with 13 per cent in the healthy weight category.
- Differences in eating behaviours were observed between body weight categories, with obese children more likely to eat more rapidly, have lower scores for responsiveness to feeling full (i.e. satiety signals) higher scores for emotional overeating and for enjoyment of food.

Factors associated with healthy eating

- The home environment was identified as the key factor in determining the healthfulness of the children’s diet, as children with healthier eating patterns were more likely to have parents from a higher social class, with third level education and married or living with a partner. For example, children were more than twice as likely to have a healthy intake of dietary fibre if their parents had third level education.
- Children with less healthy diets (and their parents) spent more time watching television than those with healthier diets (Table 5).

Table 5 The average amount of screen time viewed on weekdays and weekends during school term by children with the least healthy diets compared to children with the healthiest diets

	Least Healthy Diets	Healthiest Diets
Average weekday during school term		
TV/video viewing Hours/day	3.4	3.0
Average weekend day during school term		
TV/video viewing Hours/day	4.4	3.8

- Parents identified convenience, cost and children’s preferences and eating behaviours as significant barriers to providing a healthy diet. Interestingly, parents who recognised these factors as barriers were as likely to have children whose diets were healthy, indicating that their efforts provided them with the insight to spot the obstacles.
- While most children consumed most foods, some foods were positively associated with a healthier diet and were from the following food categories:
 - Rice, pasta, grains
 - Yogurts
 - Boiled, mashed and baked potatoes
- Foods that were associated with a less healthy diet were from the following food categories:
 - Carbonated beverages
 - Sugar and confectionery
- The way children consumed fruit was very different to the way they consumed vegetables. Vegetables were primarily eaten at lunch or during the evening meal. Fruit was mostly eaten as part of a packed lunch and as a snack throughout the day.
- The number of times per week that a child consumed vegetables during the mid-day and evening meals was a more important predictor of their vegetable intake than the actual portion consumed; offering two vegetables (e.g. carrots plus peas) at dinnertime will boost vegetable intake more than offering a larger portion of a single variety. It is a combination of the amount consumed and the frequency of consumption that helps children achieve overall fruit and vegetable intake.

- Bread and processed meats including ham, sausages and rashers made a major contribution to the salt content of all children's diets. Salt intake was 50 per cent above the recommended maximum limit in five to 10 year olds. The number of times that children ate processed meats at the mid-day or evening meal had a big influence on salt intakes in those children.
- Fibre intake was low, with 61 per cent of Irish children not meeting the recommendations for fibre intake. The main dietary sources of fibre were bread, potatoes, breakfast cereals, vegetables and fruit.
- Forty percent of children exceeded the recommendations for dietary fat. Confectionery, savoury snacks and biscuits contributed a quarter of total and saturated fat intakes. Recommendations to use low fat milk and other low fat dairy products in children of this age were not followed.

Food eaten on school days

- Almost all Irish primary school children ate a breakfast on most school days with 93 per cent of all potential breakfasts eaten. The most popular foods at breakfast were ready-to-eat breakfast cereals, milk and yogurt, bread, fruit and fruit juices. Breakfast was low in fat, high in carbohydrate and high in micronutrients such as calcium, iron, folate and 'B' vitamins. Almost one third of the average daily intake of iron and one quarter of calcium came from breakfast.
- Food eaten at school was typically prepared at home and brought to school as a packed lunch plus snacks. Overall, this food contributed 36 per cent of total daily energy, mainly from bread, biscuits, sugar-sweetened drinks, fruit, chocolate, whole milk and yogurt:

Lunch-box food contributed relatively more to sugar and salt and less to protein, dietary fibre, vitamin and mineral intakes than food eaten during the rest of the day.

- Eighty seven percent of children had sweets, chocolate or savoury snacks in their packed lunch and three-quarters of them had biscuits and cakes. Many children had chocolate, plus crisps, plus biscuits.
- Two-thirds of children had fruit, equivalent to one piece.
- Only 45 per cent of children drank milk at school, despite milk schemes in most schools. Forty-one per cent drank full fat milk and only four per cent drank low fat milk during the school day.
- Lunch-box food contributed relatively more to sugar and salt and less to protein, dietary fibre, vitamin and mineral intakes than food eaten during the rest of the day.

Conclusion

This analysis has provided more evidence to enhance our understanding of the factors that influence Irish children's weight and diet. It is important to acknowledge that this research did not explore all factors. Some areas it does not address include food access, food poverty, food purchasing habits, family eating behaviours (e.g. family meals vs eating in front of the TV), physical activity habits (e.g. members of family being active together), supportive environments for physical activity and other psychosocial factors.

The health of Irish children and adults is at serious risk

The health and well-being of the children and adults of Ireland is at serious risk because of the number of people who are gaining excess body weight and becoming obese. This is of grave concern in light of evidence that obesity in childhood is positively associated with obesity in adulthood.

In relation to children aged eight to 12 years, between 1990 and 2005 the number of boys classified as overweight has more than doubled from five per cent to 12 per cent (8). Of greater concern is the number of girls classified as obese having almost tripled from five per cent to 14 per cent. One in five boys and one in four girls are carrying excess body weight (i.e. body weights classified as either overweight or obese).

A recent survey of Irish adults (6) reported two-thirds of men (66 per cent) and more than half of women (54 per cent) are carrying excess weight. Twenty-two per cent of men and 23 per cent of women are obese, an increase from an earlier survey which reported 20 per cent of men and 16 per cent of women being obese (10). This continuing rise in obesity in adults is of considerable concern in light of the results of this report which found that parents who were overweight were more likely to have children who were overweight.

TV viewing time influences healthy habits

What we eat and how active we are every-day can greatly influence how healthy we are and our body weight.

Investigating the time spent watching TV is often used as a guide to assess people's levels of inactivity. Watching TV and using video games and computers are popular activities for many children. Spending time on these activities lessens the time children have to participate in more energetic and healthy activities. This report highlights that the time we spend watching TV can ultimately affect our body weight and how healthy our diet is. Children who are a healthy weight watch 30 minutes less TV per day than children who are overweight or obese. The children who had the healthiest diets also watched approximately 30 minutes less TV per day. Children with less healthy diets (and their parents) spend more time watching television than children with the healthiest diets. It is of interest that these findings have also been seen previously for Irish adults (10). Adults who were a healthy weight spent two to three hours per week less time watching TV than those who were overweight or obese.

The diets of Irish children are lacking in some valuable nutrients

In relation to what we eat, the NCFs highlights that the diets of Irish children are lacking in some important nutrients such as fibre, calcium and iron and are too high in other components such as fat, sugar and salt. In this analysis there were some differences noted in the types of foods eaten between those with the healthiest and least healthy diets. These differences are all in line with healthy eating guidelines. Similar dietary patterns have been found among adults.

On school days, breakfast was an important contributor to nutritional intakes. Lunchboxes tended to be higher in salt and sugar than

breakfast. This was attributable to the inclusion of 'top-shelf' foods such as sweets, chocolate and savoury snacks in lunchboxes. Another insight gained from this analysis was how children eat fruit and vegetables very differently, eating fruit as a snack or in a packed lunch and vegetables at meal times. The number of times per week children were offered vegetables at their meal times greatly improved their vegetable intake.

In terms of predicting a 'normal weight', no individual foods or specific eating patterns emerged as clear predictors of an unhealthy weight in this study. Thus, there was no evidence that overweight or obese children have unhealthy dietary patterns in terms of their food choices. One of the limitations of this analysis is that it didn't specifically investigate the influence of portion size on weight status. Portion size is likely to play an important role and should be a focus of future research.

This suggests that a focus on healthy eating should remain the mainstay for promoting healthy diets and healthy weight among Irish children.

The home environment is key to encouraging healthy habits

As the vast majority of food eaten by Irish children was consumed or prepared at home, this report showed very clearly the important role parents/guardians play in influencing what their children eat. Almost 90 per cent of food energy or calories consumed by primary school children originated in the home. This is not surprising given the reliance of children of this age on their parents/guardians to provide their food.

Habitual family practices are therefore likely to be a strong influence on the type and portion sizes eaten, cooking methods, food preferences and levels of physical activity. It is noteworthy that Irish primary school children were found to be eating breakfast on most school days. This is a very positive step to achieving a healthy diet as the breakfasts chosen were found to be low in fat, high in nourishing energy (carbohydrate) and included many important nutrients needed for growth and development. However, it is important to note that physical activity levels were not directly measured in this study. When examining the factors that impact on obesity it is critical to take into account both energy consumption and energy expenditure such as levels of physical activity.

The home environment is a priority setting for health professionals in which to provide the relevant supports for promoting healthy eating and healthy lifestyles for children, parents/guardians and families in the future.

Children/families need support to bring healthy food to school

It is well acknowledged that the school environment where children spend a large proportion of their lives can have a positive influence on creating and sustaining healthy habits for life. This report highlighted that foods eaten by children in school were typically prepared at home and brought to school. Initiatives that encourage school children and their families to prepare healthy school lunches and snacks and to eat healthily are valuable.

Almost 90 per cent of food energy or calories consumed by primary school children originated in the home.



Recommendations

The following recommendations are made while recognizing existing initiatives and research in the area of childhood obesity and healthy eating:

- Maintain and enhance current population based strategies and initiatives for the prevention of childhood obesity using a coordinated approach.
- Continue to prioritise disadvantaged groups for support with healthy eating and physical activity health promotion initiatives.
- Priority must be given to supporting parents and guardians in the home environment through
 - Ongoing public awareness campaigns such as Little Steps to raise awareness among parents and guardians of their importance as role models to their children in a healthy lifestyle; to support parents and guardians in being active and eating healthily with their children;
 - Increase awareness among those professionals who support parents and guardians of the importance of the home environment as a major influencer of children's weight and eating habits.
 - Provide support and training for health professionals who have a role in preventing or treating childhood obesity in addressing weights issue(sensitively) with parents, and in promoting healthy eating, and being active in families.
 - Support parents/guardians to recognise and become aware of what constitutes a healthy/unhealthy weight for themselves and also their children.
- The weights and heights of children and adults in Ireland should be measured for research purposes and in the evaluation of the population's obesity trends.
- Continue to engage and support primary schools to implement health promotion initiatives including nutrition and physical activity policies which promote education and supportive environments to eat healthily and be active.
- Inform parents and children of the national physical activity guidelines and encourage a reduction in TV viewing time everyday by both parents and their children. The Irish National Physical Activity Guidelines recommend at least 60 minutes of moderate intensity physical activity every day for children and at least 30 minutes of moderate intensity physical activity on 5 days a week or 150 minutes a week for adults.
- Practical advice should be made available to parents and guardians on healthy eating with emphasis on
 - Promoting increased fruit and vegetable intakes that takes account of the fact that fruit is mostly consumed as a snack or with lunch and vegetables with dinner. In addition parents should be encouraged to serve two types of vegetables at dinner.
 - Substituting less nutritious choices for healthier options e.g. brown bread for white bread, lean meats for processed meats, fruits for top shelf foods such as confectionary.

- How to identify and overcome barriers to providing children with a healthy diet. Highlight the valuable contribution that breakfast makes to meeting Irish children’s nutritional needs. Guidance on preparing healthy school lunches and snacks. Guidance on healthy eating behaviours e.g. sit and eat together, eat slowly, recognise when one is satisfied, taste and enjoy food, turn off TV when eating.
- It is important to acknowledge that there are many other influences that play a role in the prevention and management of overweight and obesity in Ireland, including government departments, education, producers, suppliers and advertisers of food, sectors who are responsible for physical environments and social and community sectors. A coordinated approach across all sectors is required.
- It is well recognised that the determinants of poor dietary behaviour are multi-factorial and knowledge of diet and health and an adequate means to provide a healthy diet have a very positive effect on children’s weight and diet. The further analysis of the NCFs data provides insight as to how to support parents/guardians with healthy eating, being active, healthy weights and healthy lifestyles for themselves and their children.

Appendix 1

The Healthy Eating Index (HEI)

The HEI provides a measure of diet quality based on how well an individual or population is meeting a set of dietary recommendations. The methodology was originally developed by the U.S. Department of Agriculture in 1995 (11).

Criteria used to define a healthy diet in Irish 5-12 year olds using the Healthy Eating Index

Nutrient	Reference Cut-Off Value (percentile of intake)	Reference Value (expressed as actual intake)
Total fat	33rd	<32.2 % Energy
Saturated fat	33rd	<13.0 % Energy
Carbohydrate	66th	>53.8 % Energy
Non-milk extrinsic sugars	33rd	<10.7% Energy
Total fruit and vegetables	66th	>2.3 servings/d
Dietary fibre	66th	>13.6 g/d
Salt intake	33rd	<4.4 g/d

The HEI methodology used in this research was:

Step 1

The 33rd or 66th percentile of intakes (as appropriate depending on which supported a healthy diet) of seven nutrients/foods were identified across the distribution of intake in the NCFs population. This provided reference cut-off points to use as criteria for defining a healthy diet among this population (see below table).

Step 2

Each child was given an overall HEI score based on the seven criteria listed above. Firstly, each child was scored between 0-100 for each criterion depending on whether the reference value was achieved or not. A score of 100 denoted

achievement of the criterion. The sum of each score was added to give an overall HEI score for each child with a maximum possible score of 700.

Step 3

Those children in the top tertile of the total HEI score were classed as having 'healthy diets' while those in the bottom tertile of HEI score were classed as having 'unhealthy diets'.

Appendix 2

Recommendations used in the study to assess compliance to intakes of fruits and vegetables, dietary fibre, fatty acids, salt and carbohydrate for children

Fruit and vegetables	400g/d	World Health Organization, 2003 (12)
Dietary fibre (g)	Age of the child plus five grams	American Heart Foundation (1995) (13)
Salt (g)	4-6 years - 3g/d 7-10 years - 5g/d 11-12 years -	FSAI (2005) (14)
Total fat Saturated fat Monounsaturated fat Polyunsaturated fat	≤35 per cent energy ≤11 per cent energy ≥ 13 per cent energy ≥ 6.5 per cent energy	DH, 1991(15)
Carbohydrate	50 per cent of energy	DH, 1991(15)

Appendix 3

Age specific Estimated Average Requirement (EAR) for minerals and vitamins

Mineral/Vitamin	Age group	Age specific EAR (mg/day)
Ca	5-6y	350
	7-10y	425
	11-12y boys	750
	11-12y girls	625
Magnesium	5-6y	90
	7-10y	150
	11-12y	230
Iron	5-6y	4.7
	7-10y	6.7
	11-12y boys and non-menstruating girls	8.7
	11-12y menstruating girls	11.4
Zinc	5-6y	5
	7-10y	5.4
	11-12y	7
Vitamin A	5-6y	300
	7-10y	350
	11-12y	400
Riboflavin	5-6y	0.6
	7-10y	0.8
	11-12y boys	1.0
	11-12 girls	0.9
Vitamin B12	5-6y	0.7
	7-10y	0.8
	11-12y boys	1

References

1. Department of Health and Children. The National Children's Strategy; Our children - their lives: DOCH 2000.
2. Finucane FM. Obesity in Irish youth: epidemiology and implications. *Irish Journal of Medical Science*. 2009 Sep;178(3):249-55.
3. Finucane FM, Pittock S, Fallon M, Hatunic M, Ong K, Burns N, et al. Elevated blood pressure in overweight and obese Irish children. *Irish Journal of Medical Science*. 2008 Dec;177(4):379-81.
4. Finucane FM, Teong L, Pittock S, Fallon M, Hatunic M, Costigan C, et al. Adverse metabolic profiles in a cohort of obese Irish children. *Ann Clin Biochem*. 2008 Mar;45(Pt 2):206-9.
5. Irish Nutrition Universities Alliance. The National Children's Food Survey 2005. www.iuna.et
6. Harrington J, Perry I, Lutomski J, Morgan K, McGee H, Shelley E, et al. SLAN 2007: Survey of lifestyle, attitudes and nutrition in Ireland. Dietary habits of the Irish population. Dublin: The Department of Health and Children 2008.
7. Cole TJ, Freeman JV, Preece MA. Body mass index reference curves for the UK, 1990. *Arch Dis Child*. 1995 Jul;73(1):25-9.
8. O'Neill JL, McCarthy SN, Burke SJ, Hannon EM, Kiely M, Flynn A, et al. Prevalence of overweight and obesity in Irish school children, using four different definitions. *European Journal of Clinical Nutrition*. 2006;61(6):743-51.
9. Cunningham K, Lee P. The Irish National Nutrition Survey. Dublin: The Irish Nutrition and Dietetic Institute 1990.
10. Irish Universities Nutrition Alliance. North South Ireland Food Consumption Survey Dublin 2001.
11. Kennedy ET, Ohls J, Carlson SKF. The Healthy Eating Index: design and applications. *J Am Diet Assoc* 1995;95:1103-8.
12. WHO. Diet, Nutrition and Prevention of Chronic Disease (Technical report series 916). Geneva: WHO 2003.
13. Williams C, Bollella M, Wynder E. A new recommendation for dietary fibre in childhood. *Pediatrics* 1995;96:958-88.
14. Food Safety Authority of Ireland. Salt and Health: Review of the Scientific Evidence and Recommendations for Public Policy in Ireland. Dublin: Food Safety Authority of Ireland 2005.
15. Department of Health. Dietary reference values for food energy and nutrients for the United Kingdom: report of the panel on dietary reference values of the committee on Medical Aspects of Food Policy. London: HMSO; 1991.

safefood

7 Eastgate Avenue, Eastgate, Little Island, Co. Cork
7 Ascaill an Gheata Thoir, An tOileán Beag, Co. Chorcaí
7 Aistyett Avenue, Aistyett, Wee Isle, Co. Cork

Tel: +353 (0)21 230 4100 **Fax:** +353 (0)21 230 4111
Email: info@safefood.eu **Web:** www.safefood.eu

www.safefood.eu
HELPLINE
NI 0800 085 1683
ROI 1850 40 4567