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Scientific Recommendations for Healthy Eating Guidelines in Ireland

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FOREWORD

Over the last two decades, adults, teenagers and children living in Ireland have experienced a dramatic rise in obesity. This brings serious health consequences due to the increased risk of cardiovascular disease (heart disease, and stroke), as well as diabetes and some cancers which are associated with being overweight. At the same time, advances in nutritional science indicate that optimal intake levels of vitamins, minerals and fibre may protect against these long-term diseases.

The world-wide rise in obesity levels coupled with the recognition of the protective effects of optimal nutrient intakes have prompted other countries (such as the United States and Canada) to completely revise their 'healthy eating guidelines'. These countries now have new 'food guides' which provide for optimal nutrition within the limits of calorie requirements for a healthy weight. These developments led to the recognition that Ireland's 'food guide' on healthy eating ('food pyramid', 1993–2010) needed a similar revision, particularly as it was not originally designed to provide specific guidance on calorie requirements

The work described in this report began in 2006 when the Department of Health and Children asked the Food Safety Authority of Ireland (FSAI) to review the Irish 'healthy eating guidelines' and the 'food pyramid'. The revised 'healthy eating dietary guidelines' produced by the steering committee were submitted to the Department of Health and Children in June, 2009. Further work continued in the FSAI on critical research relating to 'healthy eating guidelines' including a revision of portion sizes and an assessment of the affordability of healthy eating in Ireland. Part 1 of this report describes this research and concludes with an overview of the outstanding issues that need to be addressed. This incorporates recommendations for completing and implementing the newly revised 'healthy eating guidelines' in Ireland. The FSAI has completed some work on the graphic design of the new guidelines, which are outlined in Part 2 and Part 3 of this report.

Finally, it should be remembered that healthy eating can be achieved using countless different food choice combinations. Variations in food choice due to age, culture, tradition or even socio-economic circumstances can all be accommodated in a healthy diet. Therefore, the work in this report, which only focuses on mainstream food patterns common in Ireland, should be viewed as just a first step in providing guidance on healthy food choice.

In summary, this report highlights the need for a revision of the 'food pyramid', 1993-2010. The FSAI is publishing this report to facilitate more effective health promotion and disease prevention in Ireland.

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EXECUTIVE SUMMARY AND RECOMMENDATIONS

Background

Good nutrition, coupled with an active lifestyle, plays a crucial role in the prevention of chronic conditions such as obesity, cardiovascular disease (heart disease and stroke), diabetes, osteoporosis and some cancers. The most fundamental challenge for nutritionists is how to convert complex scientific knowledge into easily understood and simple messages about healthy eating and communicate these to a given population.

'Food-based dietary guidelines' is the complete scientific term for a set of healthy eating messages provided for a population, in terms of **how much and which types of foods to eat for good health**. Such guidelines are commonly referred to as 'healthy eating guidelines' or 'healthy eating advice'.

A 'food guide' is the term for a complete set of 'healthy eating guidelines', incorporating both the written food advice and a graphic model, e.g. a pyramid, plate or rainbow, developed to communicate the key healthy eating messages. The 'food guide' is a fundamental nutrition education tool, used widely by dietitians, nutritionists, nurses, teachers, other relevant professionals and community leaders to communicate healthy eating advice.

In Ireland, there has been a dramatic rise in obesity affecting all age groups, which in turn increases the risk of diseases such as cardiovascular disease (heart disease, and stroke), as well as some cancers. Obesity levels amongst men in Ireland have more than doubled to a level where now 23% are affected, compared with 20 years ago when just 8% were obese. Similarly, a third of Irish women are now overweight and approximately one sixth are obese. There is also particular concern about the high numbers of overweight and obese children and teenagers in Ireland, with one in five teenagers and more than one in five primary school children either overweight or obese.

At the same time, advances in nutritional science indicate that healthy eating advice needs to be revised to provide people with an optimal rather than merely an adequate intake of nutrients such as vitamins, minerals and fibre. The rising tide of obesity affecting all age groups coupled with the need for optimal nutrition for disease prevention have recently prompted other countries such as the United States and Canada to revise their 'healthy eating guidelines'. 'Food guides' in these countries now provide for optimal nutrition without excessive calorie intake.

Most 'food guides' were originally developed in the late 1980's and early 1990's. In 1993, Ireland adopted the American 'food pyramid', with some modifications, to make it more relevant to Ireland's population. The pyramid has been used ever since as the Republic of Ireland's* national 'food guide'. In 2005, Ireland's National Task Force on Obesity published their report which contained a key recommendation that – *Ireland's 'food guide' should be updated to provide an optimal level of nutrients without excessive energy (calories)*. In 2007, at the request of the Department of Health and Children, the FSAI undertook to evaluate Ireland's 'food 'pyramid',1993-2010, and put forward recommendations for its' revision.

The Report on Scientific Recommendations for Healthy Eating in Ireland

There is a need to revise Ireland's 'healthy eating guidelines' as one of the key measures to halt rising rates of obesity and prevent chronic disease. This report outlines:

- The evaluation of Ireland's 'food pyramid', 1993-2010
- The approaches taken to develop revised 'healthy eating guidelines' for Ireland
- Research carried out on serving sizes
- A summary of work carried out on the affordability of healthy eating and its' implications
- Recommendations for further work to complete and implement the revised 'healthy eating guidelines' for Ireland, 2010
- Recommendations for further necessary work to address the needs of other age groups, i.e. pre-school children and older people.
- The revised healthy eating advice for different age and gender groups over the age of 5 years in Ireland. This is outlined in two versions:
  a) Specific and detailed 'healthy eating guidelines' aimed at professional groups who are giving the advice and
  b) A more general version of these 'healthy eating guidelines' for consumers

* The Republic of Ireland has used the 'Food Pyramid' since 1993. However, Northern Ireland uses the 'Eatwell Plate' of the UK. The Republic of Ireland is referred to as Ireland hereafter in this report.

Historically, Ireland has used the American 'food pyramid' as the graphical model to communicate the key healthy eating messages. The Department of Health and Children advised the FSAI that the 'food pyramid' continue to be used as the graphic model for healthy eating advice in Ireland, as people are familiar with this.

Issues to Consider in the Development of 'Healthy Eating Guidelines'

In the development of a 'food guide', there are two components: 1) the healthy eating advice devised by dietitians and nutritionists and 2) the graphic model, e.g. pyramid, plate, rainbow, and wording used to convey the key messages on food choice, which are developed by those with expertise in communications and graphic design. These are both important for the effective implementation of 'healthy eating guidelines'. While some work has been initiated on the graphic model and wording, this report focuses on the development of the healthy eating advice component (the amount and type of food needed to provide optimal amounts of calories and nutrients for good health).

Optimal levels of calories and nutrients vary according to: age, gender, body weight and physical activity levels. For example:

- Growing children have very different calorie and nutrient needs to adults
- Women have different calorie and nutrient needs compared with men
- Overweight individuals have greater calorie needs compared with normal weight individuals
- Active people have greater calorie and nutrient needs compared with inactive people

The scientific approach to take account of these factors in developing healthy eating advice involves using well established goals for calories and nutrient intakes for normal weight individuals across different age and gender groups in the population. Although the majority of adults in most developed countries are overweight, it is appropriate to set population advice for the requirements of normal weight individuals. This is because normal weight compared with overweight individuals need to eat fewer calories due to their smaller body size. Overweight and obese individuals following this healthy eating advice will tend to lose their excess weight.

To take account of the variation in calorie and nutrient needs according to activity levels, calorie and nutrient goals are set to support an active lifestyle (also referred to as moderate physical activity). It is well established that an active lifestyle has enormous health benefits for everyone. Being active in everyday living protects against heart disease, stroke, diabetes, some forms of cancer and osteoporosis, as well as being overweight and obesity. Other major health benefits include better mental health, lower stress and a better sense of well-being.

However, to take account of the fact that many people in Ireland do not have an active lifestyle as recommended, the 'food guide' for health professionals also contains more specific advice on the lower food requirements for individuals who choose to be sedentary. In the revised 'healthy eating guidelines' therefore, there are two goals used for calories for everyone over the age of 13 years – one set for moderate activity levels (which everyone is recommended to reach) and another for those who *choose to be sedentary*. For children, calorie needs were based only on moderate activity levels as it was considered inappropriate to use calorie goals for inactivity at this age.

Goals were established for the main macronutrients (energy providing nutrients) implicated in disease prevention in Ireland – namely, total fat, saturated fat, fibre and non-milk extrinsic sugars (a measure of added sugars as described by COMA UK, 1989). Finally, goals were also set for micronutrients (vitamins and minerals) which tend to be of concern due to inadequacy by some groups in Ireland. These included calcium, iron and vitamin D.

Steps Taken in the Revision of Ireland's Healthy Eating Guidelines

Evaluation

Evaluation of Ireland's 'food pyramid', 1993 to 2010, identified key areas for improvement.

Using the advice outlined in the 'food pyramid', food patterns were developed for different ages and gender, taking note of areas where food advice needed to be clarified.

The patterns were analysed for calorie and nutrient content and compared with the goals described above. In general, the results showed that the 'food pyramid' tended to provide excessive calories, particularly for sedentary individuals. Almost all of the food patterns provided too much saturated fat (animal fat) and almost three-quarters provided excessive total fat. However, none of the food patterns provided enough vitamin D and the patterns for adults did not provide enough fibre.

The most significant finding in terms of the food advice given in Ireland's 'food pyramid', 1993-2010, was the wide variation in calorie content of foods within the Bread, Cereal and Potato Food Group. Healthy eating advice indicates these foods are interchangeable – yet some food servings in this group provided three times the amount of calories provided by other foods in the group. In addition, specific advice on fats and oils, e.g. to guide people towards using unsaturated and reduced fat spreads, was impractical due to the inclusion of these foods in with 'other foods' that are not necessary for healthy eating, e.g. cakes, biscuits, savoury snacks, soft drinks etc.

Achieving the goals set for calorie and nutrient intakes

For the revised 'healthy eating guidelines', twenty-two food patterns were developed for males and females aged:

- 5-12 years
- 13-18 years
- 19-50 years
- 51+ years

Nutrient outcomes

The food patterns were analysed for calories and nutrients and compared to the goals relevant according to age and gender. These food patterns were continuously adjusted and re-adjusted until they approached the goals. Compared with the patterns used for the evaluation, all of the revised food patterns were close to the goals for energy. All of the revised patterns met the goals for total fat and were close to the goals for saturated fat and non-milk extrinsic sugars. However, fibre intakes still tended to fall short in the patterns for those adults with lower calorie intakes.

Most importantly, despite best attempts to incorporate foods rich in vitamin D into the food patterns, e.g. fortified fat spreads, breakfast cereals and oily fish, intakes remained inadequate for almost all of the food patterns.

Revised food-based healthy eating advice

The amounts and types of foods used to construct the food patterns that were closest to the nutrient goals set for healthy eating were used to develop guidance on food choice. Two areas that needed particular attention concerned:

1. Steps that need to be taken to guide people more specifically on how to reduce total and saturated fat intakes. This involved separating fats and oils from 'other foods' such as cakes, biscuits, chocolate, confectionery and savoury snacks
2. Provision of specific advice on the number of servings of foods from the Bread, Cereal and Potato Food Group required to meet the calorie goals for different ages, gender and physical activity level. Foods in this group are the main providers of calories for healthy eating

Food Servings

The wide variation in calories provided by the servings of foods from the Bread, Cereal and Potato Food Group (evaluation of 'food pyramid', 1993-2010) was addressed by readjusting serving sizes so that foods in this group provided calories within the narrowest range possible. This was completed on small servings that were consistent with those in the 'food pyramid', 1993-2010, and also on larger servings which are more reflective of the servings prevalent in Ireland today. For example, the smaller serving sizes involve ½ bread roll or ½ pitta bread, while the larger servings involve a whole bread roll or pitta bread. Despite efforts to minimise the variation in calories provided by servings in this food group, there was approximately a 100 calorie difference between those foods providing the lowest and highest calories. This was irrespective of whether the servings were smaller or larger. These differences represent the natural variation in calorie content of foods in this group, e.g. a slice of wholemeal soda bread contains fewer calories than a bagel.

Research was then undertaken to find out what consumers in Ireland considered a meaningful serving size for foods within the Bread, Cereal and Potato Food Group. Food displays of the small servings and larger servings were set up and shown to over 1,000 shoppers in two supermarket chains in Dublin. The majority (74% on average) preferred the larger servings. On the basis of these findings, the larger servings are used in the revised 'healthy eating guidelines'.

Further work was carried out on categorising the food servings in this group so that guidance could be provided on calories. This led to the presentation of foods in this group in four categories. The lowest category of food servings in the Bread, Cereal and Potato Food Group now provides approximately 100 to 130 calories whilst the highest category provides approximately 190 up to 220 calories.

Research was also carried out on consumers to assess the best choice of descriptor for main meal servings of foods such as meat, poultry and fish. The majority (73%) of consumers favoured the use of 'the palm of hand' as a descriptor. The width and depth of the palm of a hand (without fingers and thumb) indicates the amount of these foods (meat, poultry or fish) appropriate for the whole day. Most of the amount indicated by the palm of the hand (without fingers and thumb) can be used for the main meal, with the remaining smaller amount used for the light meal. A biological advantage of this description is that the 'palm of the hand' corresponds well to an individual's size, so that smaller people (who need less of these high protein foods) have smaller hands and larger people (who have higher protein needs) will eat slightly more as they have larger hands.

When shown a plastic disposable 200ml cup, most of the consumers surveyed agreed that this was the best way to describe servings of many foods such as cereal, cooked pasta, cooked rice, cooked or tinned fruit and cooked vegetables and pulses (peas, beans, lentils).

Summary of the Key Healthy Eating Guidelines

Based on the main findings from the development of the revised 'healthy eating guidelines', the following are the key food-based messages.

1. Enjoy a wide variety of foods from the five food groups.
2. Find enjoyable ways to be physically active every day – balancing your food intake with active living will help protect you against disease and prevent weight gain.
3. Keep an eye on your serving sizes – choose smaller serving sizes and add plenty of vegetables, salad and fruit.
4. Plain wholemeal breads, cereals, potatoes, pasta and rice provide the best calories for a healthy weight. Base your meals on these simple foods with plenty of vegetables, salad and fruit.
5. Eat plenty of different coloured vegetables, salad and fruit – at least five a day.
6. Low-fat milk, yoghurt and cheese are best – choose milk and yoghurt more often than cheese.
7. Choose lean meat and poultry; include fish (oily is best) and remember, peas, beans and lentils are good alternatives.
8. Use polyunsaturated and monounsaturated spreads and oils sparingly – reduced fat spreads are best.
9. Grill, bake, steam or boil food, instead of frying or deep frying.
10. Healthy eating can be enjoyed with limited amounts of 'other foods' like biscuits, cakes, savoury snacks and confectionery. These foods are rich in calories, fat, sugar and salt so remember – NOT too MUCH and NOT too OFTEN.
11. Limit your salt intake.
12. Drink plenty of water.
13. Everyone should take a daily vitamin D supplement. 5µg per day for those aged 5-50 years and 10µg per day for those aged 51 years and over.
14. All women of childbearing age who are sexually active should take a folic acid supplement (400 micrograms (µg)) every day to help prevent neural tube defects (NTDs) in babies, e.g. Spina Bifida.
15. Breastfeeding should be encouraged and supported by everyone in Ireland because it gives babies the very best start in life and helps protect women's health.
16. Prepare and store food safely.

The Cost of Healthy Eating

Poor diet is a well known reason why people on a low income have a greater chance of developing conditions such as heart disease, stroke, cancers and obesity. People who are socially disadvantaged are at higher risk of succumbing to these diseases at a younger age and have a greater chance of dying younger as a consequence. For effective dietary prevention of these common diseases in Ireland, healthy eating has to be achievable by those most vulnerable. This involves ensuring foods required for healthy eating are accessible in terms of cost and acceptable in terms of typical eating habits.

During times of economic recession, many people experience financial difficulties that impact directly on their ability to afford healthy food. It is crucial for population health that healthy eating is affordable for everyone.

As part of the development of the revised 'healthy eating guidelines', it was necessary to estimate the cost of healthy eating advice and to determine the proportion of weekly income needed to meet this cost. Income was set at the level provided by social welfare allowance (including Child Benefit but excluding the National Fuel Scheme, Back to School Clothing and Footwear Allowance and Household Benefits Package). Having this information means that relevant recommendations can be made regarding ways to make healthy eating more affordable for everyone.

The main findings of the costing exercise were:

- Healthy eating is more expensive for households with children, particularly those with teenagers compared with those with younger children, yet child benefit does not account for this age difference
- Buying food for healthy eating costs on average almost twice as much in 'local shops' compared to lower-cost supermarkets. This has important implications because many families, due to reliance on public transport, do not have access to the cheaper nationwide supermarkets
- Calories from foods high in fat, sugar and salt are up to ten times cheaper than nutritious foods such as fruit, vegetables and lean meats, thus posing a major barrier to healthy eating

Action is required to ensure that healthy eating is accessible and affordable for all.

Five Key Issues and Seven Recommendations for Completion and Implementation of Revised 'Healthy Eating Guidelines' for Ireland

KEY ISSUE NO. 1

Urgent Need to Implement Revised 'Healthy Eating Guidelines' for Ireland

In 1993 when the American 'food guide' was adapted for use in Ireland as the Irish 'food pyramid', the purpose of 'healthy eating guidelines' was to help people choose foods to provide an adequate intake of nutrients. However, in line with recent advances in scientific knowledge, best practice for the development of 'healthy eating guidelines' indicates that this advice needs to guide people towards optimal food choices for disease prevention. This often means that the amounts of nutrients recommended as being optimal for health are greater than those required for adequacy, i.e. the amount required to prevent deficiency. For example, the need for calcium and vitamin D to prevent osteoporosis in later life is greater than the amounts required to prevent deficiency conditions such as rickets in children or osteomalacia in adults. At the same time, there has been a dramatic rise in obesity levels in Ireland over the past two decades and this is affecting people of all ages. Other developed countries, including the United States where the Irish 'food pyramid' originated, have already revised their 'healthy eating guidelines' to include advice on overall energy (calories) in order to tackle spiraling increases in obesity. This type of revision needs to be carried out on the 'healthy eating guidelines' for Ireland and was recommended in the report of the National Task Force on Obesity in Ireland (2005).

Therefore, the challenge in developing revised 'healthy eating guidelines' is to provide enough nutrients to satisfy the need for optimal intakes without providing excessive calories. One of the ways in which this has been possible is to provide more specific dietary advice aimed at different age and gender groups over the age of 5 years, who have different nutrient and calorie needs.

It is clear from the evaluation of the 1993-2010 'food pyramid' that the dietary advice it provides is no longer appropriate to balance the need for higher nutrient intakes within recommended calorie limits for different age and gender groups. It delivers too much energy (calories), fat, saturated fat (animal) and not enough fibre and vitamin D. In fact, the amounts of these nutrients delivered by following the 1993 – 2010 'food pyramid' are similar to what people are currently eating according to national nutrition surveys. Therefore, to improve health and prevent further increases in obesity, it is crucial that the revised 2011 'healthy eating guidelines' are implemented without delay.

RECOMMENDATION NO. 1

The revised 2010 'healthy eating guidelines' need to be implemented without delay.

KEY ISSUE NO. 2

'Food Pyramid' Model and Type of Wording that Best Communicates the Dietary Advice to Different Population Groups in Ireland

There are two equally important components inherent in the development of 'healthy eating guidelines':

- Dietary advice, i.e. the amounts and types of food people are advised to eat to meet their nutritional needs without consuming too many calories. These are developed by nutritional scientists (dietitians and nutritionists)
- Communication of this advice, i.e. the graphical model, e.g. pyramid, and the wording used to deliver the key messages. These are developed by experts in communications and graphic design

The dietary advice component has been completed and is outlined in this report. Some preliminary work on the communication component has been initiated in terms of presenting a graphical overview of the dietary advice. However, there is significant work outstanding in this area. The graphical overview presented in this report uses the 'food pyramid' as advised by the Department of Health and Children.

Work that needs to be carried out to complete this component includes:

- The development of different versions of 'food pyramid' model by experts in graphic design and communication
- These models need to be reviewed by the nutritional and dietetic scientists to ensure fidelity with the dietary advice component of the 'healthy eating guidelines'
- Focus testing needs to be carried out with different age and gender groups representing the general population and professional groups who are end users of the 'healthy eating guidelines'. This focus testing should determine which version of the 'food pyramid' model and what type of wording is most effective for different population groups

'Healthy eating guidelines' for Ireland will be finalised when feedback from these groups is incorporated into the preferred model.

RECOMMENDATION NO. 2

Different versions of the 'food pyramid' model and type of wording to communicate the revised dietary advice should be developed and focus tested to determine the most effective model and wording for different population groups.

KEY ISSUE NO. 3

The Need for Supplementation with Vitamin D

Vitamin D has long been recognised as having an essential role in bone health and prevention of conditions such as rickets and osteoporosis. In recent years, however, vitamin D is becoming increasingly implicated in the prevention of diseases other than those relating to bone. Vitamin D, for example, appears to play a role in the prevention of immune disorders, cardiovascular disease and some cancers. The action of strong sunlight on human skin stimulates the production of vitamin D, but this critical source is quite compromised due to Ireland's northerly latitude. Furthermore, exposing skin to strong sunlight is to be avoided because of the high risk of skin cancer. However, the only other source of vitamin D namely, food sources, are limited to a few foods - oily fish and liver which are rarely eaten, and a few fortified foods. Several studies in Ireland have shown a widespread lack of vitamin D affecting all ages in Ireland. The findings from both the evaluation of the 1993-2010 'food pyramid' and the development of the revised 2011 'healthy eating guidelines' showed that even with the best adjustments in food patterns, an adequate intake of vitamin D was out of reach for most people.

RECOMMENDATION NO. 3

An expert working group should be established without delay to review and update the proposal that everyone in Ireland needs to take a daily supplement of vitamin D. This work should include a comprehensive appraisal of the levels recommended (5µg for those aged 5-50 years; 10µg for those aged 51 years and over) to ensure these remain adequate and appropriate.

KEY ISSUE NO. 4

The Affordability of Healthy Eating

It should be remembered that healthy eating can be achieved using countless different food choice combinations. Variations in food choice due to age, culture, tradition or even socio-economic circumstances can all be accommodated in a healthy diet. Therefore, the work in this report, which only focuses on mainstream food patterns common in Ireland, should be viewed as just a first step in providing guidance on healthy food choice. To best meet the needs of various population sub-groups, further work is required to specifically adapt the healthy eating advice in this report through use of relevant foods.

Poor diet is a well known reason why people on a low income have a greater chance of getting conditions such as heart disease, stroke, cancers and obesity. People who are socially disadvantaged have a greater chance of succumbing to these diseases at a younger age and have a greater chance of dying at a younger age as a consequence. For effective dietary prevention of these common disease in Ireland, healthy eating has to be achievable by those most vulnerable. This involves ensuring foods required for healthy eating are accessible in terms of cost and acceptable in terms of culinary skills and typical eating habits.

Research carried out to assess the affordability of the revised 'healthy eating guidelines' for typical households in Ireland found foods high in fat, sugar and salt were generally a much cheaper source of calories. The most expensive foods were fruit and vegetables and lean meats and alternatives, which are crucial for healthy eating. It was also found that healthy eating was less affordable for families dependent on social welfare. This particularly affects families with teenagers. Teenagers have high nutrient needs during puberty and these account for the high food costs. During times of economic recession, many people experience financial difficulties that impact directly on their ability to afford healthy food. However, it is crucial for population health that healthy eating is affordable by everyone.

There is a need for more work to be carried out on how families on limited incomes can best put healthy eating into practice. This work should focus on developing advice on healthy eating using cheaper food options, e.g. 1) pulses (peas, beans and lentils) and eggs, as a cheaper alternative to meat and 2) using fruit and vegetables in season. However, there will be difficulties due to lack of familiarity with, and the acceptability of, these food options. Therefore, this work needs to be accompanied by practical activities at community level that focus on meal planning, shopping, preparing and cooking on a budget.

RECOMMENDATION NO. 4

Work should be undertaken to develop advice based on the revised 2011 'healthy eating guidelines' for Ireland which use low-cost food options. This needs to be accompanied by practical activities at community level that focus on meal planning, shopping, preparing and cooking on a budget.

Guidance on appropriate and acceptable budget-wise food choices will not be sufficient to ensure that healthy eating is affordable for everyone. The Government needs to ensure that social welfare payments are adequate to cover healthy eating needs. In addition, the Government should expand school food initiatives to directly provide staples such as fruit and milk. This should cover both primary and post-primary schools and target the nutritional needs of growing children and teenagers.

RECOMMENDATION NO. 5

Social welfare payments and EU-funded direct food provision schemes, e.g. school milk/ fruit/ vegetables, should be examined at Government level to identify strategies that make healthy eating more accessible to people dependent on low income.

KEY ISSUE NO. 5

Development of 'Healthy Eating Guidelines' for Younger and Older Age Groups

The revised 2011 'healthy eating guidelines' is intended to address the nutrient needs of the population of Ireland aged 5 to 51 years and over. The purpose of healthy eating advice for these age groups is primarily for the prevention of obesity, cardiovascular disease (heart disease and stroke) as well as cancers.

The nutritional needs of infants from birth to 12 months are quite different due to their rapid growth rate and relatively high calorie needs. Currently, the *Scientific Recommendations for a National Infant Feeding Policy* (FSAI, 1999) is being updated and revised. This will address the unique food and nutritional needs of the first year of life.

'Healthy eating guidelines' need to be developed for children in Ireland who are aged 1 to 5 years. This is a critical period of growth and development which has recently been the focus of much attention in terms of obesity prevention. Children aged 1 to 5 years are still growing rapidly and have high nutritional requirements but have a relatively small capacity for food intake. For example, their requirements for fat are high until the age of two years. After this age, fat and other dietary components should change gradually to fall in line with the 'healthy eating guidelines' outlined in this report.

Specific healthy eating advice is also required to cover the other end of the age spectrum. It is recognised that older adults vary hugely in terms of their health and fitness, mobility and independence. For instance, while many older adults remain fit and healthy and their needs are met by the 'healthy eating guidelines' in this report, others may have compromised health, mobility and independence which require special food guidance. These particular issues are best addressed through the development of a food and nutrition policy for older people. The current *Recommendations for a National Food and Nutrition Policy for Older People* (FSAI, 1999) need to be updated.

RECOMMENDATION NO. 6

'Healthy eating guidelines' need to be developed for children aged 1 to 5 years to address this critical period of growth and development.

RECOMMENDATION NO. 7

Scientific recommendations for a national food and nutrition policy for older people need to be updated and revised.

PART 1

1. INTRODUCTION

1.1 'Healthy Eating Guidelines' – Background and Terminology

Good nutrition, coupled with an active lifestyle, plays a crucial role in the prevention of chronic conditions such as obesity, cardiovascular disease (heart disease and stroke), diabetes, osteoporosis and some cancers. The most fundamental challenge for nutritionists is how to convert complex scientific knowledge into easily understood and simple messages about healthy eating and communicate these to a given population.

'Food-based dietary guidelines' is the complete scientific term for a set of healthy eating messages provided for a population, in terms of **how much and which types of foods to eat for good health**. Such guidelines are commonly referred to as 'healthy eating guidelines' or 'healthy eating advice'.

A 'food guide' is the term for a complete set of 'healthy eating guidelines', incorporating both the written food advice and a graphic model, e.g. a pyramid, plate or rainbow, developed to communicate the key healthy eating messages. A 'food guide' is a fundamental nutrition education tool, used widely by dietitians, nutritionists, nurses, teachers and other relevant professionals to communicate healthy eating advice.

1.2 'Healthy Eating Guidelines' – History

'Healthy eating guidelines' were first developed in the late 1980's and early 1990's [1, 2]. Their aim was to help people select a balanced diet that would be adequate in micronutrients, e.g. vitamins and minerals, to prevent deficiency diseases, e.g. anaemia due to lack of iron. Advice on macronutrients (fat, protein, carbohydrate and fibre) was also included to help protect against cardiovascular disease (heart disease and stroke), e.g. providing guidance on making lower fat food choices. In the early years of developing 'healthy eating guidelines', no attempt was made to provide guidance on how much energy (calories) to consume in order to meet nutrient needs and prevent weight gain. This was due to the recognition that calorie needs vary according to physical activity and that there is large variation in activity levels among people, even those of the same age and gender.

In 1993, Ireland adopted the American 'food pyramid' as its national 'food guide' with some amendments to take account of Irish eating habits. The 'food guide' was intended to provide guidance on the types and approximate amounts of food that people should eat to meet the goals for adequate nutrient intake, as outlined in the US 1989 *Recommended Dietary Allowance Report* [3]. Some adjustments have also been periodically made to Ireland's 'food pyramid' since 1993.

Since then however, advances in nutritional science signify that 'healthy eating guidelines' should now guide people at different ages and life stages towards optimal food choices for good health and disease prevention. This often means that the amounts of nutrients recommended as being optimal for health are greater than those required for adequacy, i.e. the amount required to prevent deficiency. For example, the need for calcium and vitamin D to prevent osteoporosis in later life is greater than the amounts required to prevent deficiency conditions such as rickets in children or osteomalacia in adults.

Over the same period of time, there has also been an enormous increase in obesity in Ireland as well as around the world [4]. The dramatic rise in obesity levels coupled with the shift in emphasis towards optimal nutrition, has prompted other countries to evaluate and revise their national 'food guides' ('healthy eating guidelines'). Both the United States [5] and Canada [6] have developed newly revised 'food guides' so that people can meet all of their optimal nutrient needs without consuming excessive calories. This has been achieved by developing tailored healthy eating advice based on the specific calorie and nutrient needs of different ages, gender and physical activity levels, i.e. advice for an active 9 year old boy is different to the advice for an inactive 35 year old woman.

1.3 The Need for Revised 'Healthy Eating Guidelines' in Ireland

Obesity is a major contributor to ill-health and diseases such as heart disease, diabetes and some cancers [7]. Rising rates of obesity in Ireland, particularly amongst the younger generations, have long-term undesirable consequences for the health of the population.

Currently in Ireland, more than one out of every three adult men is overweight, with one in every five so overweight that they are classified as obese [8]. Obesity levels amongst men in Ireland have more than doubled compared to just 20 years ago, when only 8% were obese [9]. Similarly, a third of Irish women are now overweight and approximately one sixth are obese [9]. However, the age and gender group with the highest prevalence of obesity is women in Ireland aged 51-64 years, with approximately one in three classified as obese. There is also particular concern about the high numbers of overweight and obese children and teenagers in Ireland, with one in five teenagers and more than one in five primary school children either overweight or obese [10,11,12].

A cornerstone of public health intervention to address the problem of obesity is healthy eating advice. This needs to be presented in an effective format for use by all professionals involved in obesity intervention strategies. The Irish 'food pyramid', 1993-2010, needed to be evaluated, updated and revised as necessary.

In 2005, Ireland's National Task Force on Obesity published their report containing one of their key recommendations:

- **Ireland's 'food guide' should be updated to provide an optimal level of nutrients without excessive calories [4]**

Similarly, in 2007, the Irish Heart Foundation re-emphasised the urgent need to prevent the rise in obesity, and take measures to reduce fat, saturated fat (animal fat) and salt in the diet [13].

At the request of the Department of Health and Children, the FSAI undertook work to revise the 'healthy eating guidelines' for Ireland. This work was carried out by a research team at the FSAI under the direction of a steering committee .

1.4 The Development of 'Healthy Eating Guidelines'

1.4.1 Content and visual representation

There are two equally important components inherent in the development of 'healthy eating guidelines':

a. Dietary advice, i.e. the amounts and types of food people are advised to eat to meet their nutritional needs without consuming too many calories. These are developed by nutritional scientists (dietitians and nutritionists)

b. Communication of this advice, i.e. the graphical model, e.g. pyramid, and the wording used to deliver the key messages. These are developed by experts in communications and graphic design

After this work is complete, the process needs to involve the following steps:

- The communications, e.g. graphic model and wording, needs to be reviewed by the nutritional and dietetic scientists to ensure fidelity with the dietary advice component of the 'healthy eating guidelines'
- Focus testing needs to be carried out with different age and gender groups representing the general population and professional groups who are end users of the 'healthy eating guidelines' to determine which version of the 'food guide' graphic model, e.g. 'food pyramid', and what type of wording is most effective for different population groups

This multidisciplinary approach is recommended as best international practice by the European Food Safety Authority (EFSA) [14] who recently published scientific recommendations on how to establish food-based dietary guidelines in a step-wise approach.

Other developed countries (United States and Canada) who have recently revised their 'food guides' to incorporate advice on energy and optimal nutrient intakes, recognised that the communication of their key healthy eating messages was an inherent part of their development [5, 6]. For the revised 'healthy eating guidelines' in both of these countries, much expertise was devoted to developing and focus testing suitable graphic models and appropriate wording. Developing this component of their 'food guides' correctly and with due consideration is essential for their effectiveness.

1.4.2 Developing healthy eating advice

Factors to consider

Until now, Ireland's 'food guide' provided advice which was generally aimed at everyone over the age of five years. However, to advise on optimal nutritional intake, particularly calories, healthy eating advice needs to be more specifically tailored according to:

1) Age
2) Gender
3) Physical activity
4) Body weight

Age – The needs of children and teenagers for nutrients such as calcium are greater than the needs of fully grown adults. Childhood and adolescence are critical periods for disease prevention and good nutrition is necessary for rapid physical growth and development. For example, getting enough calcium during puberty is a key factor for preventing osteoporosis in later life because 50% of bone mineral density is laid down over this period.

Gender – Men and women also have different nutrient needs - for example, women have higher iron needs than men due to menstruation.

Physical Activity – It is very well established that regular physical activity is vital for good physical and mental health as well as weight control and disease prevention [15]. The chances of getting coronary heart disease (CHD), type 2 diabetes, stroke, cancer, osteoporosis and depression are all reduced with regular physical activity [16]. These findings apply to everyone – children, teenagers, adults, people with disabilities and older adults [17], regardless of whether people are of a healthy weight or are overweight. Health improves in line with increases in physical activity, so the more active people become, the greater the health benefits [18].

However, according to the *National Survey of Lifestyles Attitudes and Nutrition* (SLÁN), only 41% of Irish adults take part in moderate or strenuous physical activity for at least 20 minutes, three or more times a week [19]. Similarly, the *Health Behaviours in School Children Survey* (HBSC, 2006), found that over half of primary school age children did not achieve the recommended 60 minutes per day of physical activity [20]. To be effective at increasing physical activity, it is important to focus on 'everyday activities', such as climbing the stairs, taking the dog for a walk, putting more vigour into household chores, rather than the 'sometimes activities' such as going to the gym or running a mini-marathon etc. Physical activity is an intrinsic part of staying healthy and needs to be part of everyday life.

Dietary guidance on how to achieve optimal health needs to provide energy and nutrients that support an active lifestyle. More active people require more calories and a greater intake of food overall. Because of their greater food intake, active people are unlikely to have inadequate intakes of nutrients. Inactive people are more limited in their food intake because they need to eat fewer calories in order to maintain a healthy weight and because of this, inactive people have greater difficulty in obtaining an adequate intake of the nutrients they require. The reality in Ireland today is that many people are far less active than recommended. Therefore, in addition to developing 'healthy eating guidelines' for people who are active as recommended, further advice needs to be included to guide those who are sedentary.

Body weight – The scientific approach in the development of 'healthy eating guidelines' is to use well established goals for calories and nutrient intakes for *normal* weight individuals across different age and gender groups in the population. Although the majority of adults in most developed countries, including Ireland, are overweight, it is appropriate to set population advice for the requirements of *normal* weight individuals. This is because normal weight compared with overweight individuals need to eat fewer calories due to their smaller body size. Overweight and obese individuals following this healthy eating advice will tend to lose their excess weight.

Approaches used

Healthy eating advice is usually given in terms of what to eat daily and weekly. Generally, the foods recommended for healthy eating will be those that contain important nutrients like calcium, iron or fibre with minimal intake of foods that are high in fat, sugar and salt.

Internationally agreed nutrient goals that are protective for health can be used to develop healthy eating advice for populations. Once the nutrient goals have been identified, typical daily food intake patterns for different age and gender groups can be repeatedly adjusted until the calorie and nutrients provided are in line with the goals. The types and amounts of foods used in the food patterns form the basis of the healthy eating advice. This is the approach that was used in both the United States and Canada for the recent revision of their 'food guides' [5, 6].

1.4.3 Serving sizes of foods

There is evidence that serving sizes of foods are getting larger both within and outside the home, and that this may be contributing to the problem of obesity [21, 22]. People tend to develop perceptions about 'normal' serving sizes based on the serving sizes that they see around them [22]. For example, if people see larger servings repeatedly in pre-packed foods or in restaurants, this normalises the larger serving size. This tendency, coupled with the fact that people underestimate the calories in large servings [23] may explain why larger serving size plays a role in weight gain.

In order to provide guidance on the amount of calories needed for good weight control, it is necessary to consider the serving sizes of recommended foods. This is particularly important for those foods that should ideally provide the bulk of a person's calorie needs - those from the Bread, Cereal and Potato Food Group.

Serving sizes can be subjective, so easy to understand and easily accessible descriptions of serving sizes need to be used. It is important to get feedback and agreement from people on what constitutes a meaningful serving size. However, this feedback needs to be balanced with what serving sizes *should* contain in terms of calories. For example, if people think that larger servings are meaningful but these servings are excessive in calories, then this points to the need for education on serving size rather than the adoption of the larger serving size. Research carried out with consumers and other end-users of a 'food guide', to establish appropriate serving sizes, is a crucial part of the development of 'healthy eating guidelines'.

1.4.4 Cost as a barrier to healthy eating

There are many barriers to healthy eating which are recognised as being important [24]. These include factors such as the negative perception that healthy eating is not tasty or the fact that many people believe their diets are already healthy [24]. Barriers to healthy eating based on perceptions can, and need to, be addressed by health promotion activities. However, barriers relating to accessibility require much more than health promotion activities. One such barrier is the relatively high cost of foods needed for healthy eating.

Foods such as fruit and vegetables, lean meat and poultry, are often emphasised in healthy eating advice. However, these foods tend to be more expensive. On the other hand, foods such as cakes, biscuits, confectionery and savoury snacks which are high in fat, sugar and salt are generally a far cheaper source of calories. This represents a major barrier to uptake of healthy eating advice by people on limited incomes. Poor diet is a well known reason why those on a low income have a greater chance of getting conditions such as heart disease, stroke, cancers and obesity. Assessment of the cost of healthy eating is a critical first step of many measures required to ensure healthy eating is affordable for all, particularly since those on low incomes may be more vulnerable.

1.5 Scientific Recommendations for 'Healthy Eating Guidelines' in Ireland

It is clear that there is an urgent need to revise Ireland's 'healthy eating guidelines' as one of the appropriate measures to halt rising rates of obesity and help prevent chronic disease. This report outlines:

- The evaluation of Ireland's 'food pyramid', 1993-2010
- The approaches taken to develop revised 'healthy eating guidelines' for Ireland
- Research carried out on serving sizes
- A summary of work carried out on the cost of healthy eating and its' implications
- Recommendations for further work to complete and implement the revised 'healthy eating guidelines' for Ireland 2010
- The revised healthy eating advice for different age and gender groups over the age of 5 years in Ireland. This is outlined in two versions:
  a) Specific and detailed 'healthy eating guidelines' aimed at professional groups who are giving the advice and
  b) A more general version of these 'healthy eating guidelines' for consumers

The graphical model to represent the key messages contained in the 'food guide' has not been fully addressed. Historically, Ireland has used the American 'food pyramid' as its 'food guide' graphic model. The Department of Health and Children advises that the 'food pyramid' continue to be used as the graphic model in Ireland, as people are familiar with this.

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2. APPROACHES USED TO DEVELOP THE 2011 FOOD-BASED DIETARY GUIDELINES FOR IRELAND

2.1 Goals for Healthy Eating Used to Test the 1993-2010 'Food Guide' and to Develop the Revised 'Healthy Eating Guidelines'

In order to assess how close people's eating habits are to what is recommended for health promotion and disease prevention, nutritionists use science-based goals for intakes of key nutrients. For the purposes of evaluating Ireland's 'food guide',1993-2010, and for developing the 2010 revised 'healthy eating guidelines', the first step was to decide which nutrients needed to be examined. This was determined by considering the diet-related diseases that affect people in Ireland and by prevailing dietary habits.

Given that the major public health issues facing the population living in Ireland include obesity, cardiovascular disease (heart disease and stroke), cancers, anaemia (mainly for women and children), osteoporosis and, recently, the emergence of rickets in very young children, the key related nutrients included:

- Energy (Calories)
- Total fat
- Saturated fat (animal fat)
- Fibre
- Calcium
- Iron and
- Vitamin D

The calorie and nutrient goals decided on for different age and gender groups in the Irish population are outlined in Table 1.

Table 1. Goals for different age and gender groups in the Irish population

Gender/ Age (years)	Calories (inactive)[f]	Calories (moderately active)[f]	Total fat (% energy)	Saturated fat (% energy)	Sugars[a] (% energy)	Fibre[b] (g)	Iron[c] (mg)	Calcium[e] (mg)	Vit D[e] (µg)
Boys/girls (5-13)	N/A	1400-2200	25-35	≤10	≤10	Age + 5	8-11	800-1300*	5
Boys (14-18)	2200	2400-2800	20-35	≤10	≤10	Age + 5	7	1300	5
Girls (14-18)	1800	2000	20-35	≤10	≤10	Age + 5	10	1300	5
Men (19-50)	2200	2400-2800	20-35	≤10	≤10	≥ 25	7	1000	5
Women (19-50)	1800	2000-2200	20-35	≤10	≤10	≥ 25	10(6)[d]	1000	5
Men (51+)	2000	2200-2400	20-35	≤10	≤10	≥ 25	7	1200	10
Women (51+)	1600	1800	20-35	≤10	≤10	≥ 25	6	1200	10

a Sugars are "non-milk extrinsic sugars" and include table sugar, syrups, fruit juice and sugars added to foods such as cakes, biscuits, confectionery, breakfast cereals, sweets, soft drinks, tinned and stewed fruit, jams, preserves, yoghurts and milk puddings. The goal of ≤10% daily energy was set by the UK COMA panel in their 1989 report on sugars and health [1]

b The 1995 US goal for fibre intake of "age plus 5 years" for children up to the age of 18 years was considered most appropriate [2]. The goal of ≥25g per day was taken from the Irish Heart Foundation recommendations [3]

[c] Goals for iron are based on the Nordic Nutrition Recommendations 2004 [4] and these are the "Estimated Average Requirements".

[d] Women require 6mg per day after the menopause.

[e] Goals for calcium and vitamin D are the "Adequate Intakes" recommended by the US Institute of Medicine (2006) [5].

[f] Calorie needs are taken from the US Institute of Medicine (2002)[6]. *Children aged 9 to 18 years need 1300mg calcium per day.

2.2 Evaluation of the Healthy Eating Advice Outlined in the Irish 'Food Pyramid', 1993-2010

2.2.1 Content of Ireland's 'food guide', 1993 - 2010

The foods in Ireland's 'food pyramid', 1993 - 2010 are divided into 5 major food groups and represented as 'shelves' on the pyramid. The food groups are:

- Bread, cereal and potato group
- Fruit and vegetable group
- Milk, cheese and yoghurt group
- Meat, fish and alternatives group and
- 'Other foods' which include fat spreads, oils, biscuits, cakes, chocolate, confectionery and savoury snacks

The largest shelf which is on the bottom of the pyramid is the bread, cereal and potato group. This graphical representation conveys the concept that foods from this group should contribute most to daily food intake. By contrast, the smallest shelf on the top of the pyramid which include the 'other foods' such as fat spreads and oils, represents those foods that should contribute least to daily food intake.

Some simple quantitative guidance is given in terms of how many servings should be eaten from each food group. For all people over the age of 5 years, the 1993-2010 'food guide' advises consumption of:

- 6+ servings from the bread, cereal and potato group
- 5 servings from the fruit and vegetables group
- 3 servings from the milk, cheese and yoghurt group (4 servings for teenagers and 5 servings for pregnant and breastfeeding women)
- 2 servings from the meat, fish and alternatives group

2.2.2 Methods used for the evaluation

The above advice was translated into 4-days of food patterns using the suggested numbers of servings from each food group for the following eleven theoretical subjects:

- 3 children aged 5-12 years
- 1 male and 1 female aged 13-18 years
- 2 males and 2 females aged 19-50 years
- 1 male and 1 female aged over 51 years

The daily patterns were then analysed using a specially designed computer programme for calorie and nutrient content [15] and these were compared with the goals outlined in Table 1.

2.2.3 Main nutrient-related findings

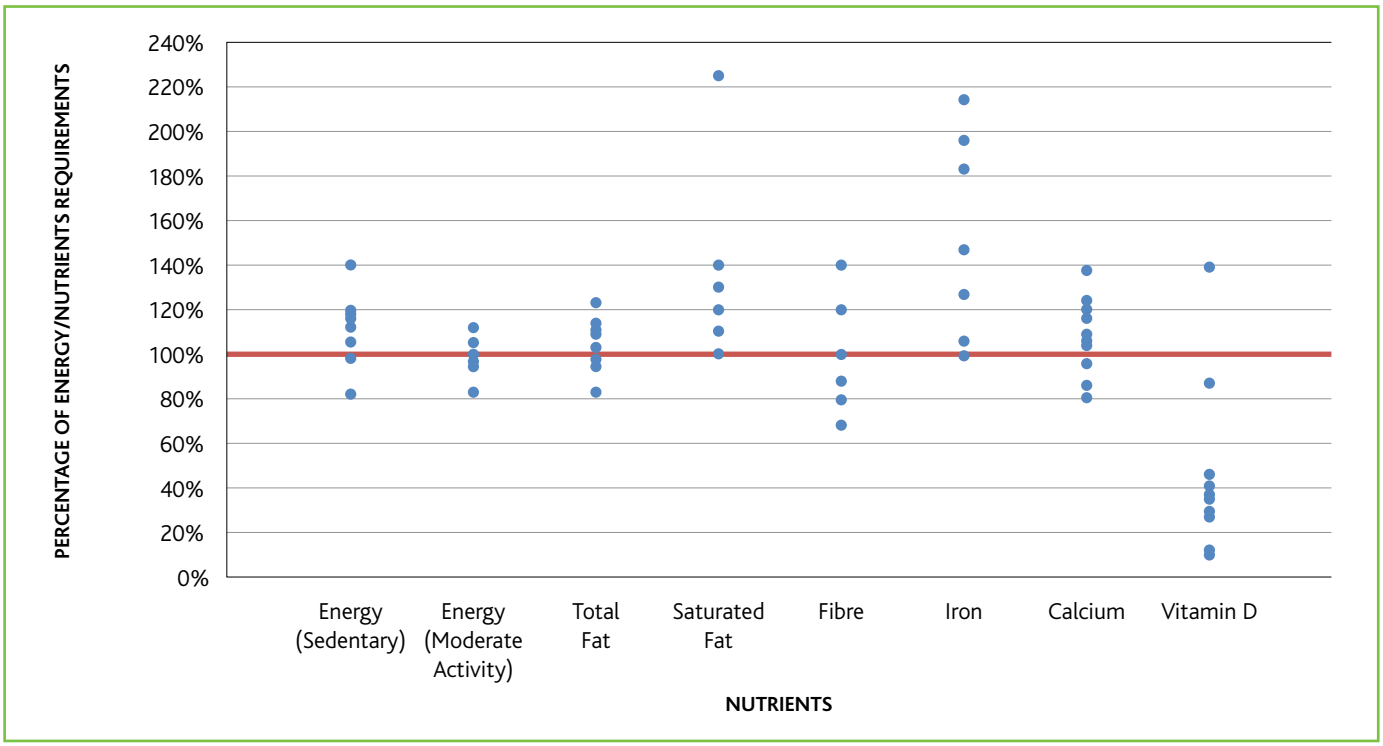
Figure 1 is a graphical representation of how close the eleven healthy eating patterns based on the 1993-2010 'food pyramid' were to the nutrient goals used for evaluation. The nutrients provided by each of the eleven patterns are described as proportions (%) of these nutrient goals. The goal for each nutrient is represented on the graph as 100% is indicated by the red line. It can be seen that for saturated fat (animal fat) for instance, the majority exceeded the target, whilst on the other hand, the majority did not reach the target recommended for adequate vitamin D intakes.

Overall, the evaluation of the healthy eating advice outlined in Ireland's 'food pyramid' 1993-2010 using the 11 food patterns found:

- Excessive calories were provided for the majority (90%) of food patterns considering the goals set for a sedentary or inactive lifestyle. The only exception to this in the evaluation was for one of the patterns for men aged 19-50 years
- Excessive calories were also provided for over one third (36%) considering the goals set for moderate activity (at least 30 minutes physical activity per day for adults, 60 minutes per day for children). The patterns affected included those for the older man aged 51+ years, the teenage girl and two of the patterns for children aged 5-12 years who have lower calorie needs
- Excessive saturated fat was provided for the majority (90%) and excessive total fat was provided for three-quarters (73%) of the food patterns. The only food pattern that achieved the saturated fat goal of 10% energy was that of the teenage boy. The food patterns that did achieve the goal for total fat included one of the patterns for men aged 19-50 years and the pattern for the teenage boy, as well as the pattern for the woman aged 51+ years whose pattern contained a very low-fat spread (25% fat)
- The majority of the food patterns for adults (83%) did not provide enough dietary fibre. The exception was one of the patterns for men aged 19-50 years. One fifth (20%) of the patterns for children and teenagers aged 5-18 years did not meet the goal of "age + 5g per day"
- The majority of the food patterns did not provide enough vitamin D (90%). The only exception was a pattern which included oily fish twice in 4 days, which would be considered unusual
- The food patterns for children aged 9-10 years did not reach the goals for calcium. This is because they have high calcium needs due to the onset of puberty, yet need fewer calories than other age groups because of their smaller body size. The patterns for other age groups achieved at least 95% of the recommended goals

In summary, these findings indicate that the healthy eating advice outlined in the Irish 'food pyramid', 1993-2010 provides too many calories, too much fat and saturated fat but not enough vitamin D and fibre. Therefore, without revision, the effectiveness of the 1993-2010 'food guide' is limited in terms of advising on obesity and disease prevention.

The range of energy and nutrient intakes provided by the eleven healthy eating patterns based on the 1993-2010 'food pyramid' compared with the recommended intakes (represented by the red line at 100%)



2.2.4 Other evaluation findings relating to practical advice on healthy eating outlined in the Irish 'food pyramid', 1993-2010

These can be summarised under the following headings in Table 2.

- Difficulty interpreting advice
- Wide range of calories provided by the foods in the Bread, Cereal and Potato Food Group
- Position of foods such as cheese and pulses (peas, beans, lentils) in food groups
- Position of fat spreads, e.g. margarines, and oils in the 'food guide'

Table 2. Findings relating to practical guidance on food choice outlined in the Irish 'food pyramid', 1993-2010

Areas of Importance	Description of Practical Advice
Difficulty interpreting advice	Advice very specific in some areas, e.g.1oz cheese, while being more ambiguous in others, e.g. a bowl of breakfast cereal Advice provided was not in line with typical eating habits, e.g. 2oz of meat twice daily rather than a larger portion for main meal and a smaller portion for light meal
Wide range of calories provided by the foods in the Bread, Cereal and Potato Food Group	Servings yield wide range of calories (75 to 250 calories) yet are suggested to be equivalent
Position of foods such as cheese in two food groups and pulses (peas, beans and lentils) only in one food group	Cheese (a high fat food) positioned in both dairy and meat and alternatives group, while pulses (peas, beans, lentils) (a low-fat alternative) only positioned in the fruit and vegetable group but not in meat and alternatives group
Position of fat, spreads and oils in the 'food guide'	Fat spreads, e.g. margarines, and oils positioned in the same food group as 'other foods' such as biscuits, cakes, chocolate, confectionery, crisps etc. This does not allow for specific guidance on types and amounts of fats to be used.

Difficulty interpreting advice

It was found that whilst some of the advice contained in the 'food guide' was clear, other parts of the 'food guide' contained vague descriptions of food and were not so easily interpreted. Serving size descriptions in some parts of the 'food guide' were very specific, e.g. 1oz of cheese, yet other serving size descriptions were vague, e.g. a bowl of breakfast cereal. This means that exact serving sizes of foods were open to misinterpretation. Hence, the calories provided by the servings varied greatly, potentially contributing to high calorie intakes.

Some serving size recommendations were very clear but were not reflective of typical eating habits. For instance, in the Meat, Fish and Alternatives Food Group, it was recommended to eat 2 x 2oz servings of lean meat per day. These amounts are not realistic and it was recognised that steps needed to be taken to develop more practical serving descriptions in the Meat, Fish and Alternatives Food Group.

Wide range of calories provided by the foods within the Bread, Cereal and Potato Food Group

The range of calories provided by servings from the Bread, Cereal and Potato Food Group was wide, with some servings such as a slice of pan bread providing 75 calories and others such as a scone providing 250 calories. Furthermore, there was the suggestion that these foods could be swapped with each other and yet they were not equivalent in calories.

Position of cheese and pulses (peas, beans, lentils) in food groups

Cheese is a rich source of calcium, but is also high in fat, especially saturated fat. This was offered as a food option in both the dairy and meat and alternatives groups, which could encourage over-consumption, giving rise to excessive fat and saturated fat intakes. On the other hand, pulses (peas, beans, lentils), a low-fat source of protein and fibre, were suggested as options only in the Fruit and Vegetable Group and not in the Meat and Alternatives Group. Having these foods in both food groups would encourage consumption and possibly help to increase fibre and lower fat intakes.

Position of fat spreads, e.g. margarines, and oils in the 'food guide'

Advice on poly and monounsaturated fats is difficult to interpret largely due to the fat spreads and oils being included in the same food group as 'other foods' such as cakes, biscuits, chocolate, confectionary and savoury snacks. This made it more difficult to give clear advice on how much and what type of fat spreads and oils to use.

In summary, these findings on nutrient quality and practical food advice helped determine the main specific areas of the 'food guide' that needed to be addressed for revising the 'healthy eating guidelines'. Overall, the evaluation findings also pointed to the need for updating the food advice with a view to providing optimal nutrients without excessive calories for various age and gender groups over the age of 5 years.

2.3 Developing Revised 'Healthy Eating Guidelines'

2.3.1 Development of food patterns to meet the goals for healthy eating

'Ideal' vs. 'practical' approach

There is international consensus [7, 8, 9] that the ideal approach to developing healthy eating advice involves the following steps:

1. Development of food patterns that are reflective of prevailing dietary habits for various age and gender groups in the population
2. Adjustment and re-adjustment of those food patterns until the main nutrient goals for healthy eating are achieved
3. Formulation of advice based on the main changes that were necessary to bring the food patterns into line with the healthy eating goals

Two approaches can be used to develop the healthy eating food patterns (described in 1 and 2 above) that underpin healthy eating advice. The most ideal approach involves using actual dietary intake data that is representative of the population and adjusting the data using a computerised modelling program. A second, more basic approach, involves the iterative development of food patterns for various age and gender sub-groups of the population by dietitians/nutritionists familiar with prevailing dietary habits. This second approach, while not ideal, represents a practical approach to improving healthy eating guidance.

Ireland is fortunate in having high quality, nationally representative dietary survey data available on children (from age 5 years) [10], teenagers [11] and adults [12]. The Steering Committee on Revision of Healthy Eating Guidelines considered using these data for the computerised modelling development of healthy eating food patterns as this approach was in line with the methods used elsewhere [13, 14]. However, it was decided by the Steering Committee that this approach was beyond the resources available for revision of 'healthy eating guidelines' in Ireland both in terms of cost and time. Therefore the second, less ideal but practical approach was decided on. This involved experienced dietitians and nutritionists, familiar with prevailing eating habits of age and gender groups in Ireland, developing food patterns on an iterative basis until the main healthy eating nutrients goals were achieved.

Age and gender groups

Steps 1 and 2 above refer to various 'age and gender groups' in the population. Such groups are necessary because calorie (energy) and nutrient needs change depending on age and life stage (body size, growth and development), gender and physical activity levels. The decision on which age and gender groups are most appropriate for developing population healthy eating advice was informed by the work and experience of other countries who had undertaken a revision of their dietary guidelines [13, 14].

i. Age groups had to be decided upon based on nutrient goals and the experience of other countries such as the US and Canada. The age groups chosen were:
   - 5 to 13 years
   - 14 to 18 years
   - 19 to 50 years and
   - 51 years and over

ii. Twenty-two sets of 4-day food patterns were developed for theoretical subjects, in each of the 4 age groups, representing different calorie requirements at 200 calorie increments, ranging from 1,400 calories for 5 year olds to 2,800 calories for moderately active teenage boys and men aged 19-50 years. The food patterns aimed to provide calories and nutrients which would reach the goals shown in Table 1. For those aged 13 years and over, calorie goals for both moderate activity and sedentary lifestyles were used. For children aged 5 to 13 years, it was not considered appropriate to have calorie goals for sedentary lifestyles, and so goals for moderate activity levels only were used.*

iii. Input was sought from dietitians specialising in public health, paediatrics and geriatrics to ensure that the food patterns reflected typical eating habits of different age groups. The patterns were repeatedly adjusted and analysed using Netwisp [15] for calorie and nutrient content until most of the goals outlined in Table 1 were met.

*Being active for adults [16] means:

- Taking part in a minimum of 30 minutes of moderate activity on at least 5 days of the week
- To help lose weight, taking part in at least 60-75 minutes of moderate activity per day
- To help keep weight off after weight loss, taking part in about 60-90 minutes of moderate activity per day

Examples of moderate activity for adults include: brisk walking, gardening, medium-paced cycling or swimming or even housework.

*Being active for children and young people [16] means:

- Taking part in a minimum of 60 minutes of moderate to vigorous activity every day

Examples of vigorous activity for children and young people includes running, swimming, cycling, skipping with a rope, basketball, football or martial arts.

2.3.2 Nutrient outcomes

The calorie and nutrients provided by the twenty-two healthy eating patterns used for the revised 'healthy eating guidelines' are outlined in Table 3. This shows that the patterns were close to all of the goals for nutrients within calorie limits, with the exception of fibre and vitamin D.

Nearly all patterns reached the recommended goals for calories. Nineteen food patterns reached within 10 calories of the goals and three reached within 16 calories of the goals. All of the food patterns met the goals for total fat and nearly all met the goals for sugars and saturated fat (animal fat). Whereas the food patterns for the evaluation of the 1993 - 2010 'food guide' reached intakes ranging from 11 to 13% calories from saturated fat, the patterns used for the revised healthy eating guidelines ranged from 8 to 11% calories from saturated fat. Added sugars (non-milk extrinsic sugars) intakes ranged from 6 to 11.5% calories.

However, the goal for fibre was not reached for many of the adult food patterns, despite the fact that wholemeal breads and cereals were used. Fibre intake depends on calorie intake – the higher the goal for calories, and therefore, the more food consumed, the easier it is to reach the goals for fibre. Adults who only need 2,200 calories per day or less will find it more difficult to eat enough fibre. This is most noticeable when calorie needs are as low as 1,800 calories per day or less, which is the reality for small adults particularly those who are inactive. Because such adults have lower calorie needs, they must eat less food overall and this makes it more difficult to achieve the absolute goal for fibre. The more active a person is, the more calories are needed, and the easier it is to get enough of this important nutrient. This finding strongly supports a recommendation for active living which will have the effect of increasing food intake and lowering risk of nutrient inadequacy.

All food patterns reached the goals for iron. However, calcium targets for 9-10 year old children fell short of the recommended intake of 1,300mg per day reaching as little as 78% of the goal. This is because early puberty begins at this age, such children need as much calcium as teenagers for bone development and yet their calorie needs are relatively low due to smaller body size. The patterns for men and women aged 51+ years achieved between 94 to 111% of their goal of 1,200mg per day for calcium.

Most importantly, despite the best attempts to incorporate foods containing vitamin D into the food patterns, e.g. fortified fat spreads, breakfast cereals and oily fish, intakes remained inadequate for almost all of the food patterns. Although the patterns for the women aged 19-50 years appeared to reach the goal of 5µg, this is because the patterns unusually contained one main meal oily fish serving and one light meal oily fish serving over 4 days. If this intake of vitamin D were to be averaged out over 7 days, the goal for vitamin D would not be reached. These findings support other research which shows that intakes of vitamin D are very low in most age groups in Ireland [17,18,19].

Overall, people who need more calories have a greater chance of achieving their goals for important nutrients like fibre, vitamins and minerals. This is clearly demonstrated by the food pattern developed for the woman aged 51+ years who only needs 1,600 calories per day, where her fibre intake fell to 16g per day. Although, calorie needs are fixed to some extent because of age and gender, e.g. men aged 19-50 years and teenage boys need more calories than women or teenage girls, people can influence how much they can eat by being more active. For example, compared to an inactive woman, a woman aged 19-50 years will be able to eat 200 more calories per day if she is moderately active. Provided the food choices she makes are healthy food choices, e.g. high fibre breads and cereals, fruit and vegetables, she will get closer to the goals for fibre, vitamins and minerals.

Table 3. The calories, fat (total fat and saturated fat), sugar, fibre, iron, calcium and vitamin D intakes for the food patterns used for the development of the revised healthy eating guidelines

Calorie and nutrient intakes								
Gender, age (yrs) and calorie target	Calories	Total fat (% energy)	Sat. fat (% energy)	Sugars (% energy)*	Fibre (g)	Iron (mg)	Calcium (mg)	Vitamin D (µg)
Male 5 yrs 1,400 kcals *active*	1,408	30.6	9.7	10.2	14.4	8.3	950	1.5
Female 9 yrs 1,600 kcals *active*	1,611	28.4	9.8	9.1	16.9	12.2	1,013	2.9
Male 10yrs 1,800 kcals *active*	1,811	30.6	8.9	6.4	21.2	12.6	1,178	1.6
Female 9yrs 2,000 kcals *active*	1,993	32.5	10.1	10.5	19.9	13.8	1,141	2.0
Male 10 yrs 2,200 kcals *active*	2,202	32.7	9.0	7.4	23.6	14.0	1,265	1.7
Female 14-18 yrs 1,800 kcals *sedentary*	1,784	28.7	9.3	7.2	17.1	12.6	1,412	4.0
Female 14-18yrs 2,000 kcals *active*	2,000	31.7	9.4	6.2	20.1	13.4	1,481	4.0
Male 14-18 yrs 2,200 kcals *sedentary*	2,204	26.5	9.0	9.7	24.4	16.5	1,470	1.7
Male 14-18 yrs 2,400 kcals *active*	2,405	31.1	10.4	9.1	24.2	15.8	1,417	1.7
Male 14-18 yrs 2,800 kcals *active*	2,796	30.2	11.2	8.8	27.7	17.5	1,545	2.0
Male 19-50yrs 2,200 kcals *sedentary*	2,196	25.7	7.6	7.8	28	14.8	1,197	3.3
Male 19-50yrs 2,400 kcals *active*	2,399	26.0	8.0	8.1	28.9	16.1	1,388	3.3
Male 19-50yrs 2,600 kcals *active*	2,594	29.6	9.3	9.9	30.4	16.3	1,387	3.4
Male 19-50yrs 2,800 kcals *active*	2,794	28.7	10.7	9.5	31.6	17.3	1,487	3.6
Female 19-50yrs 1,800 kcals *sedentary*	1,791	29.3	9.8	8.7	20.0	13.8	1,077	5.5
Female 19-50yrs 2,000 kcals *active*	1,991	31.8	10.1	8.7	22.2	16.5	1,107	5.8
Female 19-50yrs 2,200 kcals *active*	2,200	32.6	9.7	9.6	23.4	14.3	1,147	5.1
Male 51+yrs 2,000 kcals *sedentary*	2,005	32.3	9.1	7.9	20.9	13.8	1,214	0.7
Male 51+yrs 2,200 kcals *active*	2,193	33.3	9.4	8.3	22.1	14.4	1,268	0.7
Male 51+yrs 2,400 kcals *active*	2,392	35.4	10.1	7.8	24.5	15.7	1,334	1.1
Female 51+yrs 1,600 kcals *sedentary*	1,597	27.2	8.0	11.5	15.7	8.7	1,127	1.6
Female 51+yrs 1,800 kcals *active*	1,806	31.8	9.1	10.9	16.9	9.6	1,173	1.8

*Sugars are "non-milk extrinsic sugars" and include table sugar, syrups, fruit juice and sugars added to foods such as cakes, biscuits, confectionery, breakfast cereals, sweets, soft drinks, tinned and stewed fruit, jams, preserves, yoghurts and milk puddings.

2.3.3 Updated advice for healthy eating

The amounts and types of foods used to construct the food patterns that were closest to the nutrient goals set for healthy eating were used to develop guidance on food choice. Areas that needed particular attention included: number of servings from different food groups (serving size – see section 2.3.6); steps to reduce total and saturated fat; advice on 'other foods' including advice on how to achieve adequate intakes of fibre, calcium and vitamin D.

Servings from the food groups for different ages, gender and physical activity level

i. Bread, cereal and potatoes – These foods should provide the main source of calories and carbohydrates in the daily diet. It is recommended that 45 to 65% of daily calories should come from carbohydrates. The recommended number of servings varies depending on the different calorie needs. Servings range from 3 per day (for children needing 1,400 or inactive women over the age of 51 years needing 1,600 calories) to 7 per day (moderately active teenage boys and men aged 19-50 years needing 2,800 calories).

ii. Fruit and vegetables - These are nutritious low-fat, low-calorie foods and eating more helps to achieve the nutrient intakes within the calorie goals, e.g. moderately active women should ideally eat up to 6 servings per day and moderately active teenage boys and men aged 19-50 years should ideally eat up to 7 servings per day. Therefore, to cover the needs of all age groups and to encourage consumption, people are advised to eat at least 5 servings per day.

iii. Milk, yoghurt and cheese – Another way used to reach the higher calorie needs of moderately active men aged 19-50 years was to include more servings from this food group as nutritious snacks (up to 5 servings per day). The best advice for all age and gender groups is to choose low-fat varieties and choose low-fat milks and yoghurts more often than cheese. Due to the difficulty in getting enough calcium, it was also recommended that children from 9 years should increase their servings from this group from 3 to 5 per day.

iv. Meat, fish and alternatives - The slightly higher number of servings (1 to 2) suggested for the light meal for men and teenage boys also reflects the higher calorie needs of these groups.

Reducing fat and saturated (animal) fat intakes

i. One of the most important outcomes of the revision was the necessity to separate fat spreads and oils from 'other foods' and place them in a category on their own. This makes it easier to give clear advice on how much and what type of fat spreads and oils are best for healthy eating. Clear advice was given to use reduced-fat unsaturated spreads and the quantitative guide of a portion pack (7-10g) per 1-2 slices of bread was given. In addition, it was important to give the message that unsaturated oils are just as fattening as hard saturated fats (animal fats) and that they should be used sparingly.

ii. Another important outcome was that cheese, a good source of calcium, but also rich in fat and saturated fat should be confined to the Milk, Yoghurt and Cheese Food Group, and removed from the Meat, Fish and Alternatives Food Group, to help discourage excessive consumption.

iii. Taking low-fat milk more often than cheese also had to be emphasised as the best way to get enough calcium. Low fat types of yoghurts, milk puddings and cheese are also recommended.

iv. Other important advice was to use cooking methods other than frying or deep frying. Such methods include baking, boiling, steaming and grilling.

v. Choosing lean cuts of meat and poultry without skin or visible fat is another key way to keep saturated fat down.

vi. In addition, at least 5 servings or more of fruit and vegetables helped to achieve the calorie targets as they are nutritious snacks which are low in calories and fat but add bulk as they are high in fibre.

'Other foods' - biscuits, cakes, chocolate, confectionery and savoury snacks

'Other foods' such as cakes, biscuits, chocolate, confectionery and savoury snacks were used in very limited amounts in the food patterns. In general, those with higher energy needs (2,200 calories and over) had foods such as ice-cream, apple tart or popcorn included occasionally, but not every day. These foods were chosen instead of higher-fat options such as chocolate. For food patterns where the energy needs were lower, which would include women and teenage girls who were moderately active, these types of foods were not included. This is because they have to make their calories count – they need to get higher levels of nutrients like iron and calcium packed into fewer calories, without increasing their saturated fat (animal fat) intakes.

On the advice of paediatric dietitians, food patterns for children aged 5-13 years did include occasional 'other foods' such as ice-cream with cooked or tinned fruit for example.

The place of sugar, sweet and savoury snacks in healthy eating – getting the balance right

Overall, within the 'other foods' category, some choices are better than others – foods like sugar and jams/marmalade contain no fat but their use is integrated with foods that are important for healthy eating, for example, foods high in fibre, vitamins and minerals. It was demonstrated that sugar can be used sparingly to sweeten cereals such as porridge and stewed fruit, whilst jams and marmalade may replace fat spreads on wholemeal breads.

Porridge and wholemeal bread are good food choices for healthy eating due to their high fibre content and bulk, and lower fat content. Integrating small amounts of sugar and jams/preserves in this way may help to make high fibre, low fat and nutrient rich foods more palatable, without providing too much added sugar to the diet.

This rationale is also supported by evidence in the literature showing that there is an inverse relationship with sugar and fat in the diet, i.e. as sugar goes up, fat intake goes down and vice versa [20, 21, 22 and 23]. However, it is still important that sugar should only be used sparingly and in the integrated way described above. The results in Table 2 above showed that nearly all of the intakes of added or non-milk extrinsic sugars were within the goals recommended for healthy eating by the UK COMA panel in 1989 [1]. These UK goals were chosen as they are currently the most conservative goals for added sugars in Europe or in North America.

Other sources of excessive sugar in the form of sweets, soft drinks, cakes, biscuits, confectionery are not integrated with nutritious high-fibre foods. Limiting these foods will help to lower calories, fat, sugar and salt. It is important to limit how often sweet and sticky foods and drinks are taken throughout the day for the prevention of tooth decay [24]. Therefore, soft drinks, cordials and sweetened juices should be limited.

Fibre

The revised 'food guide' more clearly emphasises the need to choose wholemeal varieties of foods in the Bread, Cereal and Potato Food Group to try to increase fibre intakes.

Pulses (peas, beans and lentils) were placed in both the Fruit and Vegetables Food Group and the Meat, Fish and Alternatives Food Group to encourage increased consumption of these high fibre, low fat, nutrient rich foods. Pulses are a good source of soluble fibre and they have a low glycaemic index, which is beneficial for health [25].

Calcium

The revised 'food guide' also recommends that children from the age of 9 years eat 5 servings from the Milk, Yoghurt and Cheese Food Group due to the onset of puberty at this age.

Vitamin D

This research on the 'healthy eating guidelines' coupled with Irish data on vitamin D intakes [17, 18, 19], points clearly to the fact that people in Ireland will not get sufficient vitamin D from foods, even with the advice to eat oily fish at least once per week. Ireland's northerly latitude also means that the production of vitamin D from the action of sunlight on the skin is severely compromised. Therefore, there is a need for vitamin D supplements for everyone over the age of 5 years. The amounts recommended are those set as the goals in Table 1 - 5 µg per day for those aged 5-50 years and 10µg per day for those aged 51 years and over.

2.3.4 Other areas included in the revised 'healthy eating guidelines'

Alcohol

Alcohol is not a food and therefore has no place in any of the food groups, despite the fact that it is a source of calories. The recommendations on alcohol contained in this updated 'food guide' are in line with those of the most recent national policy on alcohol consumption made available in 2009 [26]. If alcohol is consumed, care should be taken to drink sensibly by setting limits and never bingeing. The upper limits recommended are:

- 21 standard drinks per week for men
- 14 standard drinks per week for women

These upper limits are not targets to be reached. One standard drink is equal to ½ pint beer, lager or stout, one small glass of wine or one measure of spirits.

Physical activity

The national policy on guidelines for physical activity in Ireland has also been published by the Department of Health and Children and the Health Service Executive in 2009 [16]. The recommendations on how much and what type of activity made in this 'food guide' reflect those of the new policy. However, the emphasis in this updated 'food guide' is the need to couple healthy eating with everyday active living, e.g. putting more vigour into everyday chores or housework, using the stairs more often and the car less often.

Water

The advice to drink plenty of water is important as it is the best drink for hydration and the safest for teeth. Drinking fluids regularly is important as feelings of thirst mean that a person is already dehydrated. At least 8-10 cups of fluid are needed every day and this can come from fluids in the foods eaten as well as water, milk, tea and coffee.

Salt

Eating too much salt can contribute to raised blood pressure, which can in turn lead to stroke or heart disease [27]. Cutting back on salt in the diet, along with other important measures such as eating plenty of fruit and vegetables, not drinking too much alcohol, being active, and controlling body weight all help to keep blood pressure in check.

Folic acid

Research in Ireland shows that women of childbearing age do not get enough folic acid from their food intake [28]. All women of childbearing age who are sexually active should take a folic acid supplement (400 micrograms (µg)) every day to help prevent neural tube defects (NTDs) in babies, e.g. Spina Bifida.

Pregnancy and breastfeeding

To provide healthy eating advice which takes account of all the different nutrient needs for various life stages, it was considered crucial to include healthy eating during pregnancy and breastfeeding. Healthy eating during pregnancy helps to ensure the best outcomes for both mother and baby. Breastfeeding rates are very low in Ireland [29]. Since human milk is the best food for babies and protects the health of both babies and mothers, one of the updated recommendations is that everyone in Ireland should support and encourage breastfeeding.

Food safety

Care needs to be taken to ensure that food does not become contaminated with harmful bacteria and become unsafe to eat. Providing advice on the correct handling and storage of food is important to minimise the chances of foodborne illness arising from eating unsafe food.

2.3.5 Summary of the key healthy eating advice recommendations

The table below (Table 4) summarises the most important aspects of healthy eating which have been addressed in the development of the revised 'healthy eating guidelines', and which are provided as recommendations to the population of Ireland over the age of 5 years:

Table 4. Main healthy eating recommendations for Ireland, 2011

1. Enjoy a wide variety of foods from the five food groups.
2. Find enjoyable ways to be physically active every day - balancing food intake with active living will help protect you against disease and prevent weight gain.
3. Keep an eye on your serving sizes – choose smaller serving sizes and add plenty of vegetables, salad and fruit.
4. Plain wholemeal breads, cereals, potatoes, pasta and rice provide the best calories for a healthy weight. Base your meals on these simple foods with plenty of vegetables, salad and fruit.
5. Eat plenty of different coloured vegetables, salad and fruit – at least five a day.
6. Low-fat milk, yoghurt and cheese is best - choose milk and yoghurt more often than cheese.
7. Choose lean meat and poultry; include fish (oily is best) and remember, peas, beans and lentils are good alternatives.
8. Use polyunsaturated and monounsaturated spreads and oils sparingly – reduced fat spreads are best.
9. Grill, bake, steam or boil food, instead of frying or deep frying.
10. Healthy eating can be enjoyed with limited amounts of 'other foods' like biscuits, cakes, savoury snacks and confectionary. These foods are rich in calories, fat, sugar and salt, so remember – NOT too MUCH and NOT too OFTEN.
11. Limit your salt intake.
12. Drink plenty of water.
13. Everyone should take a daily vitamin D supplement - 5µg per day for those aged 5-50 years and 10µg per day for those aged 51 years and over.
14. All women of childbearing age who are sexually active should take a folic acid supplement (400 micrograms (µg)) every day to help prevent neural tube defects (NTDs) in babies, e.g. Spina Bifida.
15. Breastfeeding should be encouraged and supported by everyone in Ireland because it gives babies the very best start in life and helps protect women's health.
16. Prepare and store food safely.

2.3.6 Serving sizes in the revised 'healthy eating guidelines'

Serving sizes in the Bread, Cereal and Potato Food Group

Aside from being a good source of carbohydrate, fibre and B vitamins, the foods in the Bread, Cereal and Potato Food Group should provide about half of an individual's daily energy (calorie) needs. Getting the right types and amounts of foods from this food group is key to ensuring that energy (calorie) needs are not exceeded.

One of the major findings from the evaluation was that the range of energy provided by suggested servings of foods from the Bread, Cereal and Potato Food Group was too wide, with some food servings containing over three times the amount of calories than others, e.g. a slice of bread (75 calories) vs. a scone (250 calories). Yet, at the same time, the majority of foods described in this group were small servings, for example, ½ a bread roll.

A key aspect of the development of the updated 'healthy eating guidelines', 2010 involved research on servings sizes of foods in general with a particular focus on foods in the Bread, Cereal and Potato Food Group. This is described in Part 3.

In brief, foods from the Bread, Cereal and Potato Food Group were displayed as small servings and larger servings. These displays were shown to a group of 44 dietitians and nutritionists as well as 1,011 consumers, who were asked which serving sizes (smaller or larger) were most practical and meaningful to them. This research provided a clear indication of what people considered to be a serving of these foods. Larger servings were preferred by a significant majority, e.g. 2 slices of bread (used to make a sandwich for instance) rather than 1 slice of bread and one medium bread roll rather than ½ a medium bread roll.

How to measure the right serving size

i. Research carried out among the 1,011 consumers (described in Part 3) sought preferences in terms of household measures to help them assess the right serving size. Consumers indicated that using dessertspoons to measure awkward items like pasta or spaghetti was impractical. However, when they were shown a plastic disposable cup (200ml), most agreed that this was the best way to describe servings of many foods such as cereal, cooked pasta, cooked rice, cooked or tinned fruit and cooked vegetables and pulses (peas, beans, lentils).

ii. Consumers favoured the 'palm of the hand' as an indicator of main meal serving size for meat, poultry and fish. The width and depth of the palm of a hand (without fingers and thumb) indicates an amount of these foods (meat, poultry and fish) which is more than enough for main meals. A biological advantage of this description is that the 'palm of the hand' corresponds well to an individual's size, so that smaller people (who need less of these high protein foods) have smaller hands and larger people (who have higher protein needs) will eat slightly more as they have larger hands.

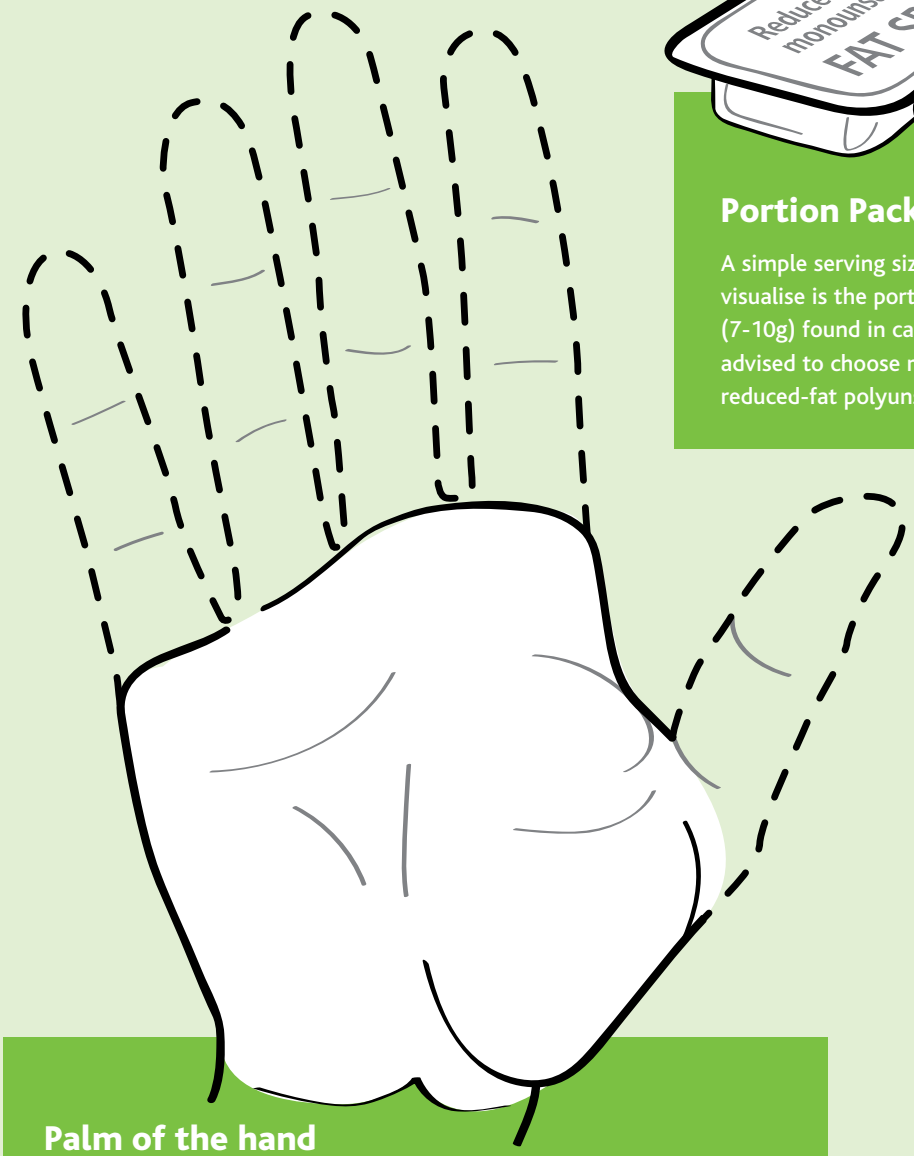
iii. Another common household measure is the 5ml teaspoon which is a useful way to describe foods such as peanut butter which provides a light meal serving from the Meat, Fish and Alternatives Food Group.

iv. Other simple serving size descriptions that are easy for people to visualise include the matchbox size piece of cheese and the portion pack of fat spread (7-10g) found in cafes and restaurants.

Portion Size Reference Guide

Portion Pack

A simple serving size description that people can visualise is the portion pack of fat spread or butter (7-10g) found in cafés and restaurants. People are advised to choose reduced-fat monounsaturated or reduced-fat polyunsaturated spreads more often.

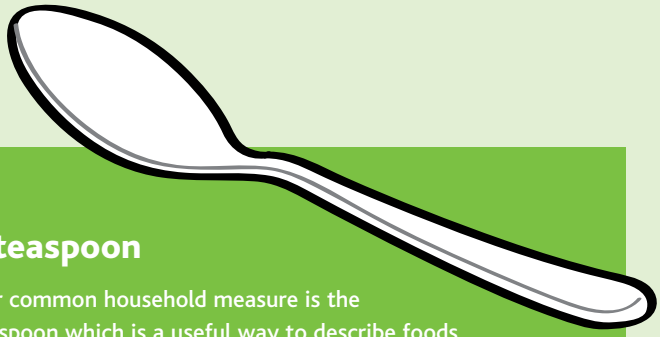


Palm of the hand

Consumers favoured the 'palm of the hand' as an indicator of main meal serving size for meat, poultry and fish. The width and depth of the palm of a hand (without fingers and thumb) provides roughly the correct amount of these foods needed for a whole day. Most of this amount can be used for the main meal, with a smaller amount used for the light meal.

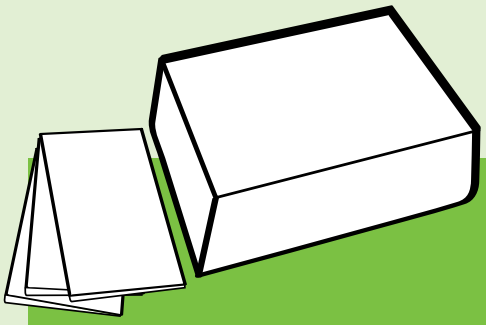
200ml Disposable Cup

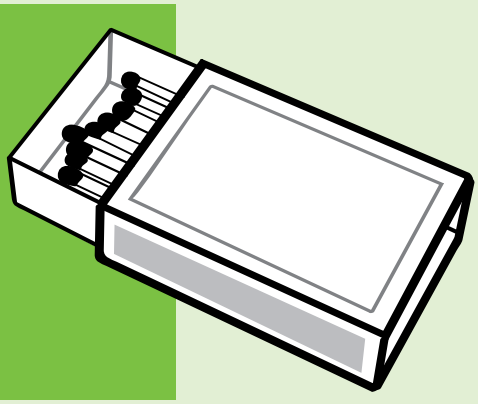
When consumers were shown a plastic disposable cup (200ml), most agreed that this was the best way to describe servings of many foods such as cereal, cooked pasta, cooked rice, cooked or tinned fruit and cooked vegetables and pulses (peas, beans, lentils).



5ml teaspoon

Another common household measure is the 5ml teaspoon which is a useful way to describe foods such as peanut butter which provides a light meal serving from the Meat, Fish and Alternatives Food Group.





Matchbox Size Piece of Cheese

Another simple serving size description that is easy for people to visualise is the matchbox size piece of cheese.

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3. DEVELOPMENT OF APPROPRIATE 'FOOD GUIDE' SERVING SIZES

3.1 The Perception of Average Servings from the Bread, Cereal and Potato Food Group in Ireland

During the evaluation of Ireland's 'food pyramid', 1993-2010, it was noted that the foods in the Bread, Cereal and Potato Food Group provided a very wide range of calories despite the fact that it was suggested these foods were equivalent in calories and could be swapped, e.g. a scone contains up to three times as many calories as a slice of pan bread. This makes it possible for people to eat too many calories, without realising it. At the same time however, the serving sizes in this food group were quite small. It was clear therefore, that a very important issue arising from the evaluation of the 'food guide' was the need to make changes to serving sizes that would address these problems.

3.1.1 Input of nutritionists/dietitians

The first step taken in the development of more appropriate serving sizes was to seek the input of 44 dietitians and nutritionists who attended a consultation workshop on the revision and update of healthy eating guidelines for Ireland. Two sets of serving sizes of typical foods in the Bread, Cereal and Potato Food Group were set up as visual displays. One display contained smaller servings based on those suggested in Ireland's 'food pyramid', 1993-2010, [1] and the second display contained larger serving sizes based on Australian food-based dietary guidelines [2]. The average food weights and calories provided by the servings in the two displays are outlined in Table 5. There was unanimous support among the dietitians and nutritionists for the adoption of the larger serving sizes as these were considered to be more realistic and meaningful, e.g. a whole bread roll vs ½ a bread roll. However, it was strongly recommended by the dietitians and nutritionists that research be carried out to validate that these larger serving sizes are in line with what consumers in Ireland perceive as average.

Table 5. Average weights and calories of displayed food servings

Food	Smaller servings		Larger servings	
	Weight (g)	Calories (kcal)	Weight (g)	Calories (kcal)
Pan bread	36	77	72	155
Batch bread	23	50	56	123
Wheaten soda bread	24	65	44	120
Bread roll	25	66	50	132
Crispbread	20	61	40	122
Crackers	21	87	28	116
Tortilla wrap	28	82	56	164
Pitta bread	30	77	60	153
Scone	30	83	91	250
Mashed potato	120	86	180	129
Boiled potatoes	100	72	200	144
Baked potato	90	67	180	134
Cooked rice	90	123	150	205
Cooked pasta	60	63	120	126
Cooked porridge	160	84	210	110
Wholewheat flakes	30	99	36	119
Flake cereal	20	75	30	113
Muesli	30	109	60	218
Cereal biscuit	20	70	40	140
Bagel	35	109	70	218
Ciabatta	63	172	125	344
Petit pain	25	53	50	105
Average	**49**	**83**	**89**	**156**

3.1.2 Consumer research

A survey was carried out among 1,011 consumers who were shopping in two large Dublin supermarkets – one in an advantaged area and one in a disadvantaged area – using the same two food displays described above. These consumers were asked the question *"Which set of portion sizes are the best fit with your idea of average?"* The majority of consumers (74%) indicated that the larger portion sizes were the best fit with their idea of average. In particular, the larger serving size, i.e. whole unit, of the bread roll, bagel, scone, pitta bread and tortilla wrap were favoured. These findings were similar in both the advantaged and disadvantaged areas. While there was a significant overall preference for larger servings, there was a gender difference - more males compared to females preferred the larger servings (88% vs 68%), $p < 0.001$. In addition, there was also a tendency for a smaller majority of the older consumers aged 71+ years compared to younger consumers (31-50 years) to favour the larger servings, $p < 0.01$. Overall, the vast majority of all consumers asked preferred the larger servings rather than the smaller servings (see Figure 2).

After indicating their overall preference for larger or smaller sizes, consumers were asked to identify foods where they wished to alter serving size (i.e. increase or decrease). Some people tended to want even bigger servings of cooked pasta (11%), wheaten soda bread (10%), batch loaf (9%) and cooked rice (7%), than the large servings on display. On the other hand, others preferred smaller servings of the mashed and boiled potatoes (See Table 6).

Figure 2. Shoppers' perceptions of average servings of foods in the Bread, Cereal and Potato Food Group

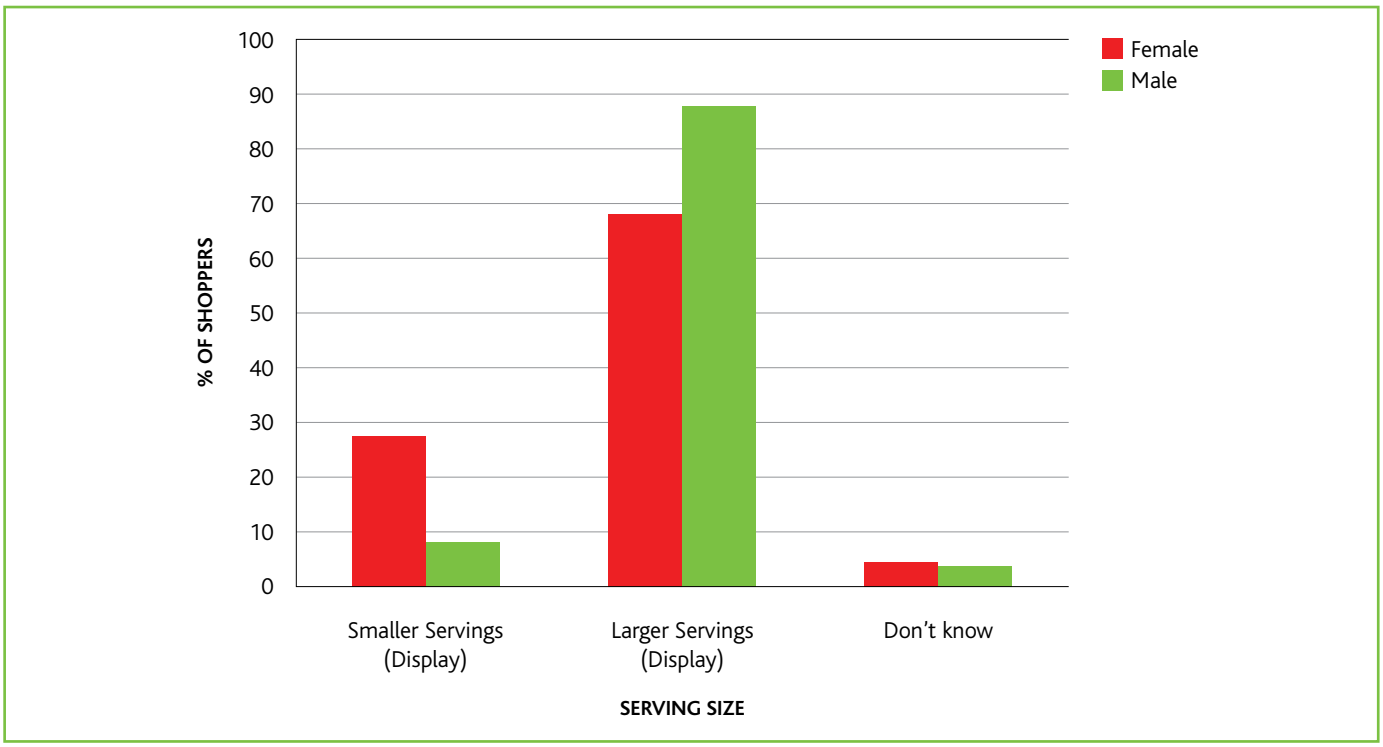


Table 6. Proportions of consumers (%(n)) preferring serving sizes of bread, cereal and potato foods from either the two displays or extra small, extra large or 'in-between'

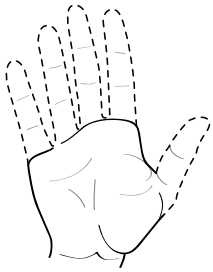
FOOD	Extra small		Smaller display		In-between display sizes		Larger display		Extra large	
	%	N	%	N	%	N	%	N	%	N
Pan bread	0	1	**23**	**228**	0	0	**71**	**718**	2	16
Batch loaf	0	0	**20**	**197**	0	1	**67**	**675**	9	91
Wheaten soda bread	0	0	**15**	**156**	0	0	**70**	**705**	10	102
Roll	0	0	**19**	**195**	0	3	**74**	**745**	2	20
Tortilla wrap	0	2	**19**	**192**	0	0	**75**	**755**	1	12
Pitta bread	0	0	**20**	**201**	0	2	**75**	**757**	0	3
Crispbread	0	3	**24**	**241**	0	2	**71**	**716**	0	1
Crackers	1	12	**22**	**226**	0	2	**72**	**729**	1	6
Mashed potato	2	18	**28**	**285**	0	4	**60**	**609**	5	47
Boiled potato	2	16	**26**	**265**	5	45	**58**	**589**	5	48
Baked potato	0	4	**21**	**215**	0	2	**70**	**707**	4	35
Cooked rice	1	7	**24**	**238**	1	5	**63**	**640**	7	73
Cooked pasta	0	1	**20**	**203**	1	9	**63**	**636**	11	114
Porridge	0	4	**22**	**223**	0	0	**71**	**716**	2	20
Wholewheat flakes	0	4	**22**	**222**	0	2	**68**	**684**	5	51
Flake cereal	0	1	**23**	**229**	0	4	**67**	**673**	6	56
Muesli	0	0	**22**	**221**	0	2	**70**	**707**	3	34
Cereal biscuit	0	0	**21**	**214**	1	5	**71**	**714**	3	30
Scone	0	0	**19**	**187**	1	10	**76**	**764**	0	2
Petit pan	0	0	**19**	**192**	0	1	**73**	**738**	3	32
Bagel	0	0	**20**	**200**	0	1	**75**	**758**	0	4
Ciabatta	0	0	**22**	**226**	0	0	**73**	**735**	0	2

NOTE: The sum of results displayed for each food is less than 100% because a small proportion of consumers (average 4%) responded "Don't Know".

3.2 Use of Practical Household Measures for Describing Serving Sizes

3.2.1 Meat, fish and alternatives – the 'palm of the hand' vs. the 'deck of cards'

Other areas of Ireland's 'food pyramid', 1993-2010, relating to serving size which were found to be impractical included the recommended servings of food in the Meat, Fish and Alternatives Food Group, e.g. 2 x 2oz of lean meat per day. This suggested serving size is not typical of eating habits in Ireland where the serving of meat, fish and alternatives is larger for the main meal.



To address this, consumers were asked about their preferences for common serving size measures for meat, poultry and fish. The majority of consumers (73%) preferred the 'palm of the hand' as a more practical indicator of main meal serving size compared with a 'deck of cards' (See Table 7). The width and depth of the palm of a hand without fingers and thumb gives an indication of the amount of these protein foods appropriate for the whole day. Most of the amount indicated by the palm of the hand (without fingers and thumb) can be used for the main meal, with the remaining smaller amount used for the light meal. A biological advantage of this description is that the 'palm of the hand' corresponds well to an individual's size, so that smaller people (who need less of these high protein foods) have smaller hands and larger people (who have higher protein needs) will eat slightly more as they have larger hands.

Table 7. Preferences for practical serving size measures and descriptors

	MEAT/FISH/ETC				CEREAL/RICE/PASTA			
	Palm of hand		Pack of cards		Cup		Dessertspoon	
	%	N	%	N	%	N	%	N
Total sample	73	735	21	215	73	354	23	112
<18 years	63	5	25	2	100	3	0	0
18 - 30 years	71	136	22	42	69	74	26	28
31-50 years	75	335	20	89	76	179	22	52
51-70 years	73	207	23	64	74	81	19	21
71+ years	67	50	23	17	56	15	41	11

NOTE: The sum of results displayed for each food is less than 100% because a small proportion of consumers (average 4-6%) responded "Don't Know".

3.2.2 Common household measures

Less than half of the consumers surveyed were also asked whether they would prefer to use the dessertspoon or 200ml disposable plastic cup to describe servings of foods such as cereal, cooked pasta and rice, and cooked or tinned fruit and vegetables. The majority of consumers (73%) preferred the cup as a more practical way to describe servings of foods such as cereal, cooked pasta, cooked rice, cooked or tinned fruit and cooked vegetables and pulses (peas, beans, lentils). Consumers commented that using dessertspoons to measure awkward items like pasta or spaghetti was impractical.

3.3 Developing New Serving Sizes for Foods in the Bread, Cereal and Potato Food Group

On the basis of the findings of the survey, the recommended serving sizes of breads, cereals and potatoes were made larger to be more meaningful to the consumer. In addition, the servings of these foods such as cereals, cooked pasta and rice were also provided in terms of 'cups' where appropriate. For practical reasons, the use of the cup slightly adjusted some of the servings used in the larger display, e.g. 1 cup provides 40g of wheat flakes, rather than 36g used in the display.

A critical aspect to communicate in relation to bread, cereal and potatoes is the variation in calories provided by different foods in this group. Despite best efforts to narrow the range of calories provided by foods in this group, the lowest energy foods in this group, e.g. porridge or a medium baked potato, provided up to 100 calories less than other foods in this group, e.g. 1 bagel. To communicate this natural variation in calories, the foods were grouped into four different categories ranging from lowest to highest calories in approximately 30 calorie increments.

This was carried out to make people aware that these foods vary in calories. This more detailed advice in the revised 'healthy eating guidelines' is intended to help people understand that foods in this food group are not all equivalent in terms of calories, and that it is important to make wise lower-calorie, high-fibre choices whenever possible (Table 7). For example, ⅓ cup porridge oats or 1 cup cereal flakes are lower in calories and therefore, a better choice than ½ cup of muesli for breakfast. Similarly, 1 slice of batch loaf or 2 medium pan slices of bread are lower in calories than 2 'thick cut' bread slices and a medium bread roll is lower in calories than a tortilla wrap, half a lunch baguette*, or a bagel.

Finally, in order to maintain a calorie range of not more than 100 calories provided by different foods in this group, it should be noted that use of half servings of some foods was unavoidable. This is because these foods are only available in large portion sizes, e.g. demi-baguette, panini roll, ciabatta roll. Consumers need to be aware that these foods provide more calories than other breads.

* 5 inch French baguette

Table 8. Serving sizes and calorie content of foods from the Bread, Cereal and Potato Food Group

Breads, Cereals and Potatoes Each of the following counts as ONE serving. Some foods are higher than others in calories – use the guide to choose wisely for a healthy weight. Wholemeal and wholegrain are best*			
100 – 135 calories	**135 – 160 calories**	**160 – 190 calories**	**190 – 220 calories**
½ cup raw porridge oats*	2 wholegrain cereal biscuits*	½ cup muesli	
1 cup wholemeal cereal flakes*			1½ cups wholemeal cereal flakes*
1 slice soda wholemeal bread*	2 regular slices wholemeal pan bread*	1 tortilla wrap	2 'thick cut' slices wholemeal pan bread*
1 slice wholemeal batch loaf*	1 wholemeal pitta bread*	5 inch (13cm) baguette roll (approx. ½ lunch size baguette roll)	1 bagel
1 medium wholemeal bread roll*		½ panini bread	
4 wholemeal crispbread or crackers*		½ ciabatta roll	
1 medium sized boiled or baked potato			
3 scoops potato mash (using ice cream scoop)	1 cup cooked basmati rice	1 cup cooked 'easy cook' white rice	1 cup cooked brown rice
1 cup cooked pasta shapes	1 cup cooked white spaghetti	1 cup cooked brown spaghetti*	

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4. THE COST OF HEALTHY EATING

4.1 The Need to Make Healthy Eating Affordable for Everyone

Social disadvantage such as poor housing, lack of access to education and healthcare, low income and poor nutrition are all determinants of ill-health [1]. People on low incomes have a greater chance of getting preventable diseases at a younger age and therefore, have a greater chance of dying younger as a consequence [2]. Low income is associated with poor nutrition at all life stages [3] which in turn has major consequences for health. For example, poor nutrition during infancy and other critical developmental stages such as puberty increases risk of chronic diseases such as heart disease, obesity and diabetes.

The purpose of healthy eating advice is to help protect people from obesity, heart disease, stroke and some cancers. There are many barriers to healthy eating including factors such as lack of knowledge and awareness [4] and even lack of time [5]. Barriers such as these that relate to knowledge and perceptions can be addressed by health promotion activities that focus on supporting behavioural change. However, other barriers relating to accessibility cannot be addressed through lifestyle changes and require interventions that tackle other social factors such as income, housing and transport. In relation to this, it is well established that foods needed for healthy eating are relatively expensive [6]. For example, foods such as fruit and vegetables, lean meat and poultry, which are emphasised in healthy eating advice are more expensive than foods such as cakes, biscuits, confectionery and savoury snacks which are high in fat, sugar and salt and need to be limited.

During times of economic recession, many people experience financial difficulties that impact directly on their ability to afford healthy food. However, for population health it is essential that healthy eating is accessible for everyone.

Assessment of the cost of healthy eating is a crucial first step of many measures required to ensure healthy eating is affordable for all. As part of the development of the revised healthy eating guidelines, it was necessary to examine the cost of foods required for healthy eating. This research included:

- Identifying the types of household in Ireland, in terms of demographic make-up, for whom healthy eating is least affordable, i.e. identifying who is most at risk
- Identifying which food groups are the most expensive
- Determining the effect on cost of the type of shop used for shopping

This information enables the development of relevant recommendations that address ways to ensure healthy eating is affordable for everyone.

4.2 Examination of the Cost of Healthy Eating

4.2.1 The methods used

The approach taken to assess the cost of healthy eating involved three main areas of research. Firstly, the age and gender make-up of the four most common households in Ireland was determined. Secondly, the foods that made up the healthy eating patterns (described in Section 2) for the individuals in the four most common households were costed. This assessment was undertaken three different types of grocery shop. Finally, the weekly incomes for the four most common households was set at the level provided by social welfare allowance (including child benefit but excluding the National Fuel Scheme, Back to School Clothing and Footwear Allowance and Household Benefits Package). The cost of the foods required for healthy eating was expressed as a proportion of weekly social welfare allowance and child benefit.

The most common types of households in Ireland

The age and gender make-up of the four most common households in Ireland were determined using data from the national Census in 2006[7]. These households were:

1. Man and woman (both aged 40-44 years) with 2 male children (one aged 5-9 and the other 10-14 years)
2. Man and woman (aged 40-44 years) with no children
3. Woman living alone (aged 65 years+)
4. Lone parent (woman aged 40-44 years) and male child (age 5-9 years)

Cost of foods required for healthy eating

The foods used in the food patterns developed for the revised healthy eating guidelines were priced for:

- Male aged 19-50 years, requiring 2,400 calories
- Female aged 19-50 years requiring 2,000 calories
- Boy aged 5 years requiring 1,400 calories
- Boy aged 14 years requiring 2,400 calories
- Female aged 51 years+ requiring 1,800 calories

The patterns used were those based on calorie requirements for moderate activity as this is in line with recommendations to promote health and prevent chronic disease. The cost of the foods used were calculated using prices in March/April 2009 from three Dublin shops for comparison. These were:

1. Multiple nationwide supermarket
2. Multiple nationwide low cost supermarket and
3. Local convenience shop

Where possible, food items were priced using the cheapest brand available and this generally meant that 'own brands' were used.

The income for these four households was set at the total social welfare allowance which included the child benefit but excluded the National Fuel Scheme, Back-to-School Clothing and Footwear Allowance and Household Benefits Package. In 2009, the weekly income based on the above amounted to:

- €468.52 for a family of four
- €339.90 for the couple with no children
- €230.30 for a woman aged 65+ years
- €268.61 for a lone parent with a young male child

More recently, these weekly incomes were adjusted to account for changes in the 2010 national budget. In addition, the food costs were adjusted by -6.4% in line with food price trends from April 2009 to January 2010 (Source: Central Statistics Office [7])

The cost and percentage of weekly social welfare allowance and child benefit needed to buy foods for healthy eating in the three different grocery stores (with original and adjusted figures) are shown in Table 9.

Table 9. The cost (€) and percentage (%) of weekly social welfare allowance* and child benefit required to purchase the foods necessary for healthy eating for the 4 most common households using three different grocery store outlets

Cost(€) and Percentage(%) of Social Welfare Allowance			
	Multiple supermarket	Low cost shop	Local shop
Household 1. Adult man and woman, boy aged 5 years and boy aged 14 years (Total household requires 8,200 calories per day)	€141.42 30%	€122.65 26%	€272.90 58%
*Updated costs post budget 2010***	€132.40 29%	€114.80 25%	€255.40 56%
Household 2. Adult man and woman without children (Total household requires 4,400 calories per day)	€87.85 26%	€70.29 21%	€165.25 49%
*Updated costs post budget 2010***	€82.20 25%	€65.80 20%	€154.70 47%
Household 3. Woman aged 65+ years (requiring 1,800 calories per day)	€34.64 15%	€28.87 13%	€57.66 25%
*Updated costs post budget 2010***	€32.40 14%	€27 12%	€54 23%
Household 4. Single adult woman with a boy aged 5 years (Total household requires 3,400 calories per day)	€58.55 22%	€48.54 18%	€116.78 43%
*Updated costs post budget 2010***	€54.80 21%	€45.40 17%	€109 42%

*Social welfare allowance includes child benefit but excludes the National Fuel Scheme, Back to School Clothing and Footwear Allowance and Household Benefits Package.

** Original figures adjusted by -6.4% in line with food price trends from April 2009 to January 2010 (Source: Central Statistics Office [7])

4.2.2 The cost of healthy eating – the findings

Healthy eating is more expensive for households with children and the cost of healthy eating is age related

The cost of healthy eating using the multiple nationwide grocery outlet accounted for about one third of the social welfare allowance, which is high considering this money has to provide for all other household expenses. Healthy eating tended to be more expensive for households with children than without, particularly in families that included older children. The higher cost for the older child reflects the greater needs of teenagers for calories and other nutrients to support adolescence, the time when most growth and rapid development occur. However, welfare payments do not take this fact into consideration. For example, the cost of healthy eating for an older child (teenager) is twice that of a younger child.

- For a 5 year old boy needing 1,400 calories per day, food costs in a supermarket chain is 28% of the child income support* (€64 per week). However, if food is purchased in a local convenience shop, the cost increases to 61% of his child income support.
- For a fourteen year old boy who requires 2,400 calories per day, the food costs in the same shop is 54% of the child income support. However, if food is purchased in a local convenience shop, the cost increases to 106% of child income support, i.e. his child income support will not cover his food needs for healthy eating.

*The social welfare allowance for the child plus the child benefit.

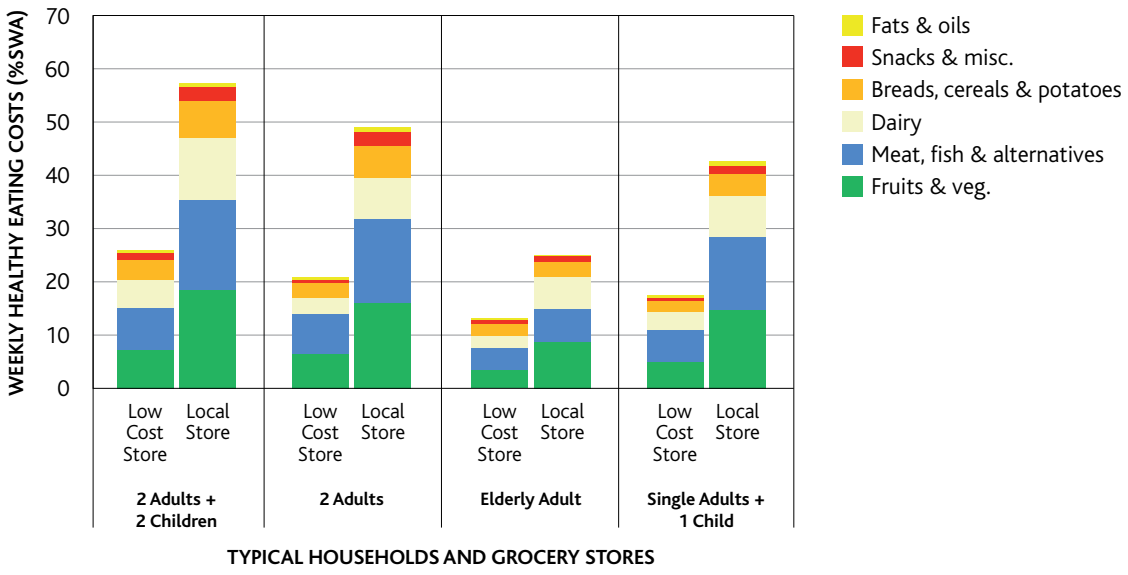
Where a family shops influences the cost of healthy eating

As outlined in Table 9, this research found that local convenience shops tended to be almost twice as expensive for the foods required for healthy eating for all households considered. It costs a family of four €272.90 to shop in a local store compared to €141.42 in a supermarket chain. Similarly, for a couple with no children, it costs €165.25 to shop at a local convenience shop compared to €87.85 in a supermarket chain. This is a significant finding as it is known that access to more affordable grocery stores can be difficult for many families on low income due to reliance on public transport and other difficulties accessing multiple supermarkets.

Healthy foods are more expensive than foods high in fat, sugar and salt

The largest proportion of money spent on healthy eating is for fruit and vegetables. Lean meat and fish are the next most expensive foods. Calories from foods rich in fat, sugar and salt are far cheaper. For a family of four, 33% of the weekly money spent on food for healthy eating is required to cover the cost of fruit and vegetables (€46.81). For the same family, 29% of the weekly money spent on food goes towards the cost of lean meat and fish (€40.86). Similarly, the cost for the other household types was between 33 and 37% for fruit and vegetables and 29 to 34% for lean meat and fish. This means that it is easier to replace lean meat with cheaper processed meats, which are higher in fat and salt. Figure 3 shows the cost of healthy eating as a percentage of social welfare allowance by food group. This clearly shows that fruit and vegetables, followed by meat, fish and alternatives are the most expensive food groups.

Figure 3. The cost of healthy eating in the cheapest and most expensive grocery shops as a proportion (%) of social welfare allowance* by food group



*Social welfare allowance includes child benefit but excludes the National Fuel Scheme, Back to School Clothing and Footwear Allowance and Household Benefits Package.

In fact, it is up to ten times cheaper to provide calories from foods high in fat, sugar and salt than it is to provide calories from beneficial, nutritious foods such as fruit and vegetables. Table 10 shows the cost of foods from these food groups per 100 calories. Other researchers have found that cheaper calories from foods high in fat and sugar may be partly responsible for the rise in obesity amongst low income groups [6].

Table 10. Cost of food groups per 100 calories

Food groups	Cost (€) in cheapest grocery store
Fruit and vegetables	€0.45
Snacks, biscuits, cakes etc.	€0.17
Fat spreads and oils	€0.04

4.3 Implications

This examination of the cost of healthy eating shows that the ability of households on low income to achieve the healthy eating goals is compromised. This puts people in low-income households in Ireland at increased risk of diet-related diseases such as obesity, heart disease, stroke and cancers. Research shows that people on low incomes are likely to be affected by these diseases at a younger age [2].

It is possible however, to provide healthy eating guidance for people on low incomes using budget-wise food choices. This could include advising more reliance on cheaper foods, for example, in relation to the Meat, Fish and Alternatives Food Group, such advice would promote use of cheaper cuts of meat, eggs, beans and other pulses. However, these types of foods may not be typical of the families' usual eating patterns. This approach therefore, poses additional barriers relating to acceptability, culture and tradition. To be effective, any guidance using budget-wise food choices needs to be accompanied by strategies involving practical activities at community level that focus on meal planning, shopping, preparing and cooking on a budget.

It is recommended that social welfare payments and EU-funded direct food provision schemes, e.g. EU school milk and EU school fruit/ vegetable schemes, are examined at Government level to identify strategies that make healthy eating more accessible.

Given these issues, the following two recommendations for 'healthy eating guidelines' in Ireland are made in this report:

RECOMMENDATION NO. 4

Work should be undertaken to develop advice based on the revised 2011 'healthy eating guidelines' for Ireland which use low-cost food options. This needs to be accompanied by practical activities at community level that focus on meal planning, shopping, preparing and cooking on a budget.

RECOMMENDATION NO. 5

Social welfare payments and EU-funded direct food provision schemes, e.g. school milk/fruit/ vegetables, should be examined at Government level to identify strategies that make healthy eating more accessible to people dependent on low income.

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5. FIVE KEY ISSUES AND SEVEN RECOMMENDATIONS FOR COMPLETION AND IMPLEMENTATION OF REVISED HEALTHY EATING GUIDELINES FOR IRELAND

KEY ISSUE NO. 1

5.1 Urgent Need to Implement Revised 'Healthy Eating Guidelines' for Ireland

In 1993 when the American 'food guide' was adapted for use in Ireland as the Irish 'food pyramid', the purpose of 'healthy eating guidelines' was to help people choose foods to provide an adequate intake of nutrients. However, in line with recent advances in scientific knowledge, best practice for the development of 'healthy eating guidelines' indicates that this advice needs to guide people towards optimal food choices for disease prevention. This often means that the amounts of nutrients recommended as being optimal for health are greater than those required for adequacy, i.e. the amount required to prevent deficiency. For example, the need for calcium and vitamin D to prevent osteoporosis in later life is greater than the amounts required to prevent deficiency conditions such as rickets in children or osteomalacia in adults. At the same time, there has been a dramatic rise in obesity in Ireland over the past two decades and this is affecting people of all ages.

Other developed countries, including the United States where the Irish 'food pyramid' originated, have already revised their 'healthy eating guidelines' to include advice on overall energy (calories) in order to tackle spiraling increases in obesity. This type of revision needs to be carried out on the 'healthy eating guidelines' for Ireland and was recommended in the report of the National Task Force on Obesity in Ireland (2005).

Therefore, the challenge in developing revised 'healthy eating guidelines' is to provide enough nutrients to satisfy the need for optimal intakes without providing excessive calories. One of the ways in which this has been possible, is to provide more specific dietary advice aimed at different age and gender groups over the age of 5 years, who have different nutrient and calorie needs.

It is clear from the evaluation of the 1993-2010 'food pyramid' that the dietary advice it provides is no longer appropriate to balance the need for higher nutrient intakes within recommended calorie limits for different age and gender groups. It delivers too much energy (calories), fat, saturated fat (animal) and not enough fibre and vitamin D. In fact, the amounts of these nutrients delivered by following the 1993 – 2010 'food pyramid' are similar to what people are currently eating according to national nutrition surveys. Therefore, to improve health and prevent further increases in obesity, it is crucial that the revised 2011 'healthy eating guidelines' are implemented without delay.

RECOMMENDATION NO.1

The revised 2011 'healthy eating guidelines' need to be implemented without delay.

KEY ISSUE NO. 2

5.2 'Food Pyramid' Model and Type of Wording that Best Communicates the Dietary Advice to Different Population Groups in Ireland

There are two equally important components inherent in the development of 'healthy eating guidelines':

- Dietary advice, i.e. the amounts and types of food people are advised to eat to meet their nutritional needs without consuming too many calories. These are developed by nutritional scientists (dietitians and nutritionists)
- Communication of this advice, i.e. the graphical model, e.g. pyramid, and the wording used to deliver the key messages. These are developed by experts in communications and graphic design

The dietary advice component has been completed and is outlined in this report. Some preliminary work on the communication component has been initiated in terms of presenting a graphical overview of the dietary advice. However, there is significant work outstanding in this area. The graphical overview presented in this report uses the 'food pyramid' as advised by the Department of Health and Children.

Work that needs to be carried out to complete this component includes:

- The development of different versions of 'food pyramid' model by experts in graphic design and communication
- These models need to be reviewed by the nutritional and dietetic scientists to ensure fidelity with the dietary advice component of the 'healthy eating guidelines'
- Focus testing needs to be carried out with different age and gender groups representing the general population and professional groups who are end users of the 'healthy eating guidelines'. This focus testing should determine which version of the 'food pyramid' model and what type of wording is most effective for different population groups

'Healthy eating guidelines' for Ireland will be finalised when feedback from these groups is incorporated into the preferred model.

RECOMMENDATION NO. 2

Different versions of the 'food pyramid' model and type of wording to communicate the revised dietary advice should be developed and focus tested to determine the most effective model and wording for different population groups.

KEY ISSUE NO. 3

5.3 The Need for Supplementation with Vitamin D

Vitamin D has long been recognised as having an essential role in bone health and prevention of conditions such as rickets and osteoporosis. In recent years, however, vitamin D is becoming increasingly implicated in the prevention of diseases other than those relating to bone. Vitamin D, for example, appears to play a role in the prevention of immune disorders, cardiovascular disease and some cancers. The action of strong sunlight on human skin stimulates the production of vitamin D, but this critical source is quite compromised due to Ireland's northerly latitude. Furthermore, exposing skin to strong sunlight is to be avoided because of the high risk of skin cancer. However, the only other source of vitamin D namely, food sources, are limited to a few foods - oily fish and liver which are rarely eaten, and a few fortified foods. Several studies in Ireland have shown a widespread lack of vitamin D affecting all ages in Ireland. The findings from both the evaluation of the 1993-2010 'food pyramid' and the development of the revised 2011 'healthy eating guidelines' showed that even with the best adjustments in food patterns, an adequate intake of vitamin D was out of reach for most people.

RECOMMENDATION NO. 3

An expert working group should be established without delay to review and update the proposal that everyone in Ireland needs to take a daily supplement of vitamin D. This work should include a comprehensive appraisal of the levels recommended (5µg for those aged 5-50 years; 10µg for those aged 51 years and over) to ensure these remain adequate and appropriate.

KEY ISSUE NO. 4

5.4 The Affordability of Healthy Eating

It should be remembered that healthy eating can be achieved using countless different food choice combinations. Variations in food choice due to age, culture, tradition or even socio-economic circumstances can all be accommodated in a healthy diet. Therefore, the work in this report which only focuses on mainstream food patterns common in Ireland, should be viewed as just a *first step* in providing guidance on healthy food choice. To best meet the needs of various population sub-groups, further work is required to specifically adapt the healthy eating advice in this report through use of relevant foods.

Poor diet is a well known reason why people on a low income have a greater chance of getting conditions such as heart disease, stroke, cancers and obesity. People who are socially disadvantaged have a greater chance of succumbing to these diseases at a younger age and have a greater chance of dying at a younger age as a consequence. For effective dietary prevention of these common diseases in Ireland, healthy eating has to be achievable by those most vulnerable. This involves ensuring foods required for healthy eating are accessible in terms of cost and acceptable in terms of culinary skills and typical eating habits.

Research carried out to assess the affordability of the revised 'healthy eating guidelines' for typical households in Ireland found foods high in fat, sugar and salt were generally a much cheaper source of calories. The most expensive foods were fruit and vegetables and lean meats and alternatives, which are crucial for healthy eating. It was also found that healthy eating was less affordable for families dependent on social welfare. This particularly affects families with teenagers. Teenagers have high nutrient needs during puberty and these account for the high food costs.

During times of economic recession, many people experience financial difficulties that impact directly on their ability to afford healthy food. However, it is crucial for population health that healthy eating is affordable by everyone.

There is a need for more work to be carried out on how families on limited incomes can best put healthy eating into practice. This work should focus on developing advice on healthy eating using cheaper food options, e.g. 1) pulses (peas, beans and lentils) and eggs, as a cheaper alternative to meat and 2) using fruit and vegetables in season. However, there will be difficulties due to lack of familiarity with, and the acceptability of, these food options. Therefore, this work needs to be accompanied by practical activities at community level that focus on meal planning, shopping, preparing and cooking on a budget.

RECOMMENDATION NO. 4

Work should be undertaken to develop advice based on the revised 2011 'healthy eating guidelines' for Ireland which use low-cost food options. This needs to be accompanied by practical activities at community level that focus on meal planning, shopping, preparing and cooking on a budget.

Guidance on appropriate and acceptable budget-wise food choices will not be sufficient to ensure that healthy eating is affordable for everyone. The Government needs to ensure that social welfare payments are adequate to cover healthy eating needs. In addition, the Government should expand school food initiatives to directly provide staples such as fruit and milk. This should cover both primary and post-primary schools and target the nutritional needs of growing children and teenagers.

RECOMMENDATION NO. 5

Social welfare payments and EU-funded direct food provision schemes, e.g. school milk/fruit/vegetables, should be examined at Government level to identify strategies that make healthy eating more accessible to people dependent on low income.

KEY ISSUE NO. 5

5.5 Development of 'Healthy Eating Guidelines' for Younger and Older Age Groups

The revised 2011 'healthy eating guidelines' are intended to address the nutrient needs of the population of Ireland aged 5 to 51 years and over. The purpose of healthy eating advice for these age groups is primarily for the prevention of obesity, cardiovascular disease (heart disease and stroke) as well as cancers.

The nutritional needs of infants from birth to 12 months are quite different due to their rapid growth rate and relatively high calorie needs. Currently, the *Scientific Recommendations for a National Infant Feeding Policy* (FSAI, 1999) is being updated and revised. This will address the unique food and nutritional needs of the first year of life.

'Healthy eating guidelines' need to be developed for children in Ireland who are aged 1 to 5 years. This is a critical period of growth and development which has recently been the focus of much attention in terms of obesity prevention. Children aged 1 to 5 years are still growing rapidly and have high nutritional requirements but have a relatively small capacity for food intake. For example, their requirements for fat are high until the age of two years. After this age, fat and other dietary components should change gradually to fall in line with the 'healthy eating guidelines' outlined in this report.

Specific healthy eating advice is also required to cover the other end of the age spectrum. It is recognised that older adults vary hugely in terms of their health and fitness, mobility and independence. For instance, while many older adults remain fit and healthy and their needs are met by the 'healthy eating guidelines' in this report, others may have compromised health, mobility and independence which require special food guidance. These particular issues are best addressed through the development of a food and nutrition policy for older people. The *Recommendations for a National Food and Nutrition Policy for Older People* (FSAI, 1999) need to be updated.

RECOMMENDATION NO. 6

'Healthy eating guidelines' need to be developed for children aged 1 to 5 years to address this critical period of growth and development.

RECOMMENDATION NO. 7

Scientific recommendations for a national food and nutrition policy for older people need to be updated and revised.

PART 2

Food Safety
AUTHORITY OF IRELAND

ADVICE FOR HEALTH PROFESSIONALS AND HEALTH EDUCATORS ON HEALTHY EATING AND ACTIVE LIVING IN IRELAND

Guidelines for children over the age of 5 years, teenagers, adults and older adults

ADVICE FOR HEALTH PROFESSIONALS AND HEALTH EDUCATORS ON HEALTHY EATING AND ACTIVE LIVING IN IRELAND

Guidelines for children over the age of 5 years, teenagers, adults and older adults

1. Healthy Eating and Active Living

Essential for a healthy lifestyle

Eating a wide variety of nutritious foods, coupled with active living, is the key to maintaining good health throughout life. Active living and eating well go hand in hand. Eating nutritious foods in the right quantity is not only important for disease prevention, but also to fuel and sustain active living. Being active has enormous health benefits for everyone and it is essential to make it part of a person's everyday life. Active living means finding ways to be physically active every day. Examples are putting extra vigour into housework and gardening, taking the stairs where possible or going for a walk instead of watching TV.

The benefits of eating well and being active include:

- A lower risk of diseases such as diabetes, heart disease and cancer
- Stronger muscles and bones
- A healthy body weight
- Feeling and looking better

However, at various times in life, people need different things from food:

- **Children and teenagers** need to eat well and be active to get the nutrients they need for growth and to reach their full potential, without the problem of excessive weight gain. They also need to eat enough foods containing iron to help prevent deficiency (anaemia).
- **Adults** need to eat well and be active for good health and to protect themselves from disease. Eating plenty of foods such as fruit and vegetables and choosing wholemeal varieties of cereals where possible, helps protect against heart disease and cancer. Eating these foods more often and limiting other foods that are high in fat, salt and sugar is the key to healthy eating. It is also very important for adults to balance the amount of food eaten with enough daily activity to help control their body weight.
- **Women** need to ensure they get enough calcium and vitamin D daily for bone health, as bones gradually start to weaken in adulthood. Before the menopause, women have some protection against osteoporosis (weakening of bones) and heart disease due to the female hormones (oestrogen). Women also need to ensure they eat enough foods containing iron to help prevent iron deficiency anaemia.

  After the menopause, as women have a higher risk of developing heart disease they need to eat well and be active to help lower this risk. Bones also start to weaken at a faster rate after the menopause and therefore, it is important to eat the right foods to get enough calcium every day. Vitamin D is also crucial for healthy bones. Women need to take a supplement containing vitamin D (5µg) every day to be sure they are getting the right amount.

  All women of childbearing age who are sexually active should take a folic acid supplement (400 micrograms (µg)) every day to help protect their unborn baby from neural tube defects (NTDs), e.g. Spina Bifida.

  During pregnancy, women should eat oily fish at least once per week, e.g. salmon, sardines, herring and mackerel, as they provide special fatty acids (long chain omega-3 fatty acids) which are important during pregnancy for eye and brain development in the baby. However, pregnant women need to avoid alcohol, large fish (marlin, shark, ray) containing mercury and limit caffeine consumption due to the possible harmful effects on the baby.
- **Men** need to pay particular attention to prevention of heart disease, as they do not have the same hormonal protection as women. Osteoporosis also affects men as bones start to weaken with age and so men need to ensure they eat the right foods to get enough calcium every day. Vitamin D is also crucial for healthy bones. Men need to take a supplement containing vitamin D (5µg) every day to be sure they are getting the right amount.
- **Older adults** (aged 51+ years) need to continue to eat well and stay active for good health and disease prevention. In particular, from 51 years onwards, it is vital to ensure they eat the right foods to get enough calcium which will help keep bones healthy. Older adults in Ireland are at a high risk of vitamin D deficiency. Due to age, their skin is less efficient at making vitamin D from sunlight. Older adults need to take a daily supplement containing a higher dose of vitamin D (10µg).

This guide explains how to advise people to choose the right types of food in the right amounts to make sure they get enough vitamins and minerals for good health.

2. Guidelines for Healthy Eating

- Enjoy a wide variety of foods from the five food groups.
- Find enjoyable ways to be physically active every day - balancing your food intake with active living will help protect you against disease and prevent weight gain.
- Keep an eye on your serving sizes - choose smaller serving sizes and add plenty of vegetables, salad and fruit.
- Plain wholemeal breads, cereals, potatoes, pasta and rice provide the best calories for a healthy weight. Base your meals on these simple foods with plenty of vegetables, salad and fruit.
- Eat plenty of different coloured vegetables, salad and fruit – at least five a day.
- Low-fat milk, yoghurt and cheese is best - choose milk and yoghurt more often than cheese.
- Choose lean meat and poultry; include fish (oily is best) and remember, peas, beans and lentils are good alternatives.
- Use polyunsaturated and monounsaturated spreads and oils sparingly – reduced fat spreads are best.
- Grill, bake, steam or boil food, instead of frying or deep frying.
- Healthy eating can be enjoyed with limited amounts of 'other foods' like biscuits, cakes, savoury snacks and confectionary. These foods are rich in calories, fat, sugar and salt so remember – NOT too MUCH and NOT too OFTEN.
- Limit your salt intake.
- Drink plenty of water.
- Everyone should take a daily vitamin D supplement.

  For healthy bones, everyone needs to take a daily vitamin D supplement. A vitamin D3-only supplement is best.

  – 5 micrograms (µg) vitamin D every day is recommended for everyone aged 5 to 50 years.

  – 10 micrograms (µg) vitamin D every day is recommended for everyone aged 51 years and over.

- All women of childbearing age who are sexually active should take a folic acid supplement (400 micrograms (µg)) every day to help prevent neural tube defects (NTDs) in babies, e.g. Spina Bifida.
- Breastfeeding should be encouraged and supported by everyone in Ireland because it gives babies the very best start in life and helps protect women's health.

- Prepare and store food safely.

3. Enjoy a Wide Variety of Foods

Never before have people been able to choose from such a wide variety of foods. However, no single food can do the job of providing all the vitamins and minerals that the body needs. Foods should be eaten in the right amounts and in the right combination to achieve a healthy diet. Foods can be grouped together depending on the nutrients they provide. This forms the basis of our 'food pyramid', where foods providing similar nutrients are grouped together on the same shelf:

- Wholegrain bread, cereals, pasta and rice as well as potatoes are rich in carbohydrate, B vitamins and fibre
- Fruit and vegetables provide vitamins, minerals, fibre and other protective substances
- Milk, yoghurts and cheese are rich in calcium and also provide protein
- Lean meats, poultry and fish provide good quality protein as well as iron (red meat is best for iron)
  - oily fish is an excellent source of omega-3 special fatty acids which are good for heart health
  - peas, beans and lentils are great low-fat, high-fibre protein foods
- A little unsaturated (polyunsaturated and monounsaturated) fats and oils provide essential fatty acids – **but only small amounts are needed** (see more about fats in 'Fat Spreads and Oils')

Know Your Fats

Fats people should eat less:

- **Saturated fats** - these fats are solid at room temperature and tend to raise 'bad' LDL blood cholesterol levels, which leads to heart disease. Saturated fats are found in foods of animal origin such as butter, cream, fat in meat and dairy products as well as biscuits, cakes, chocolate, confectionery and savoury snacks. Lard, dairy spreads, coconut and palm oil also contain saturated fat.
- **Trans fats**[1] also raise 'bad' LDL blood cholesterol levels leading to heart disease. However, *trans* fats are more harmful than saturated fats because they reduce 'good' HDL cholesterol. Trans fats are produced when oils are changed to solid hard fats during food processing, and can be present in foods cooked in fast-food outlets. Other foods likely to contain trans fats include hard margarines and foods made from them such as biscuits, cakes, pies, pastries, chocolate, savoury snacks and confectionery.

[1] *Trans* fats are also known as 'hydrogenated (or 'partially hydrogenated') fats' or 'hydrogenated (or 'partially hydrogenated') vegetable oils'

Fats that can be eaten in small amounts:

- **Polyunsaturated fats** - these plant fats are naturally liquid at room temperature and margarines made from polyunsaturated oils are generally very soft. Polyunsaturated fats do not raise blood cholesterol levels and can be useful to replace some saturated fat in the diet. But **polyunsaturated fats contain just as many calories as saturated fat and so need to be limited**. Examples of polyunsaturated oils include sunflower oil, safflower oil, corn oil, soya oil, sesame seed oil, linseed oil and grape seed oil. Polyunsaturated margarines are made from these oils.
- **Monounsaturated fats** - these fats are also liquid at room temperature and margarines made from these oils are also soft. These fats do not raise blood cholesterol and have been used for generations in Mediterranean countries in place of saturated fats such as butter. **Monounsaturated fats also contain just as many calories as saturated fat and need to be limited**. Examples include olive oil, canola oil, peanut oil and rapeseed oil, and fat spreads made from these.

REMEMBER – IT DOES NOT MATTER WHICH TYPE OF FAT OR OIL (SATURATED, MONOUNSATURATED OR POLYUNSATURATED), ALL FATS AND OILS CONTAIN THE SAME AMOUNT OF CALORIES.

What are 'essential fatty acids'?

There are two fats (known as fatty acids) that the body needs to function properly but cannot make itself and so must get from our food. This is why these fatty acids are called 'essential'. The two fatty acids are known as:

1. Linoleic acid (an omega-6 fatty acid) and
2. Alpha-linolenic acid (an omega-3 fatty acid)

Almost all of the fats needed by humans can be made from these two fatty acids. Only small amounts of these fatty acids are needed and people will easily get enough by following the advice given in the Fat Spreads and Oils Food Group.

What are long chain omega-3 fatty acids?

Long chain omega-3 fatty acids are called DHA and EPA. They are only found in oily fish such as herring, mackerel, salmon, sardines, pilchards, kippers and trout. The human body has very limited ability to make these *long chain* omega-3 fatty acids. Therefore, they are sometimes referred to as essential fatty acids. These long chain omega-3 fatty acids are very important as they help to prevent blood clots forming and are protective against heart disease. They are also important for brain and eye development in babies during pregnancy and early life. This is why fish is recommended, especially oily fish.

It is not always easy to get the balance right:

- Some people may be missing out on important nutrients because they are not getting enough variety
- Others may be eating too many 'other foods' such as cakes, biscuits, savoury snacks and fried foods which are high in calories, fat, salt and sugar

People should try to make room for more nutritious foods their bodies need by eating less of these 'other foods'.

MANY FOODS SUCH AS CEREALS, JUICES, SPREADS AND DAIRY PRODUCTS ARE FORTIFIED, I.E. THEY HAVE EXTRA VITAMINS AND MINERALS ADDED. THESE FOODS CAN BE USEFUL TO INCREASE NUTRIENT INTAKE. BUT FORTIFIED FOODS CANNOT BE RELIED ON TO PROVIDE EXACT AMOUNTS OF NUTRIENTS.

THE FOLLOWING PAGES WILL HELP YOU TO ADVISE PEOPLE CHOOSE THE RIGHT FOODS FOR HEALTHY EATING.

4. 'Food Guide' Servings for different Age and Gender Groups

The Importance of 'Active Living'

The number of servings recommended from each food group relates to the amount of nutrients and calories needed. This varies depending on three factors:

1. Age
2. Gender
3. Physical activity

Physical activity is the only one of these three factors that can be changed to improve health. Therefore, people need to be active at every opportunity and in everything they do as part of their daily routine. Putting extra vigour into housework, going up and down the stairs, playing outdoors with the children, mowing the lawn, washing the car, taking the dog for a walk - this is what is meant by 'active living'.

Physical Activity and Number of Servings from the Bread, Cereal and Potato Food Group

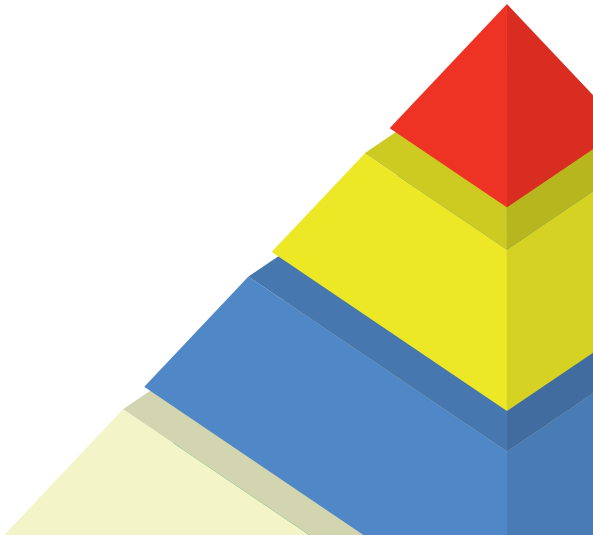
Foods from the Bread, Cereal and Potato Food Group are the main energy (calories) providers. A person's age and gender influences their energy needs for their body size and make-up. However, the biggest factor affecting how much energy (calories) a person needs is physical activity. The more active a person is the more energy (calories) they need. Being active is best for health. Therefore, this 'food guide' advises on healthy eating (number of servings) for a moderately active lifestyle.

However, also shown in this 'food guide' are the number of servings from the Bread, Cereal and Potato Food Group for people who are sedentary or inactive. These are shown in blue on the 'Food Guide' Servings table[2].

Being Active for Adults Means:

- Taking part in a minimum of 30 minutes of moderate activity on at least 5 days of the week
- To help lose weight, taking part in at least 60-75 minutes of moderate activity per day
- To help keep weight off after weight loss, taking part in about 60-90 minutes of moderate activity per day

Examples of moderate activity for adults include: brisk walking, gardening, medium-paced cycling or swimming or even housework.



[2] Adults and children who are very active may need more servings from the Bread, Cereal and Potato Food Group.

Being Active for Children and Young People Means:

- Taking part in a minimum of 60 minutes of moderate to vigorous activity every day

  Examples of vigorous activity for children and young people includes running, swimming, cycling, skipping with a rope, basketball, football or martial arts.

THOSE WORRIED ABOUT THEIR LEVEL OF FITNESS OR THOSE WHO HAVE NOT BEEN ACTIVE FOR SOME TIME, SHOULD SEEK ADVICE FROM THEIR DOCTOR ABOUT HOW TO INCREASE THEIR ACTIVITY LEVELS SAFELY.

What is best for someone who is overweight?

Following the 'food guide' servings for age and gender and aiming to be moderately active - adults who are overweight will tend to lose weight if they eat the servings recommended from the 'food guide'. This is because their energy needs are higher than normal weight individuals, and the servings listed in the table opposite are based on the needs of those who are normal weight and active.

REMEMBER, THAT FOR CHILDREN AND TEENAGERS, SUFFICIENT NUTRITION FOR GROWTH AND DEVELOPMENT IS THE PRIORITY.

5. Serving Sizes

To help maintain a healthy weight, people should be advised to keep a close eye on serving size.

It is well known that serving sizes of most foods and drinks are getting bigger and this is a major factor leading to dramatic rises in overweight and obesity in people in Ireland. It is crucial therefore, that people pay attention to serving sizes of foods and avoid large servings. A lot of attention was given to working out suitable serving sizes for healthy eating in this updated 'food guide'. A survey of over 1,000 adults reported that these serving sizes made sense and were meaningful.

People in Ireland prefer to use common household measures to help them choose the right serving size. People in general find that using dessertspoons to measure awkward items like pasta or spaghetti is impractical. In the survey of adults living in Ireland, the vast majority agreed that a plastic disposable cup (200ml) was the best way to describe servings of many foods such as cereal, pasta, rice, cooked or tinned fruit and cooked vegetables and pulses (peas, beans, lentils).

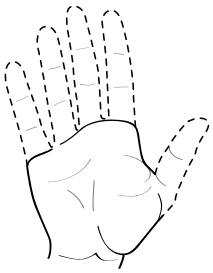
It is a very good idea to check how well the servings eaten normally compare with the servings advised for healthy eating. (See recommended daily servings).

Even when people are familiar with serving sizes for healthy eating, there will always be a tendency for serving sizes to get bigger. To make sure people are staying on the right track it is a really good idea to check serving sizes a few times a year using the disposable 200ml cup - for instance, at the start of the year, and again in spring and autumn.

Some specific notes on serving sizes

Single serving sizes of low-fat yoghurts and low-fat milk puddings vary widely. Remember to compare serving sizes against the 200ml disposable cup recommended in the serving size guide. It is used as a guide to measure a low-fat yoghurt or low-fat milk pudding serving. Low-fat rice pudding contains slightly less calcium than equal amounts of low-fat yoghurts or custard, hence 1 cup of low-fat milk pudding or ¾ cup of low-fat custard provide a serving.

People in Ireland prefer to describe main meal servings of meat, poultry or fish in terms of the size of the palm of their hand. The width and depth of anyone's palm (without fingers and thumb) provides enough of these foods for the whole day. Most of this can be used for the main meal, with a smaller amount used for the light meal. The bigger a person is, the bigger their palm of hand will be and the smaller a person is, the smaller their palm of hand will be. This is great because the need for daily amounts of meat, poultry and fish varies according to body size, the bigger a person is the more they need and vice versa.

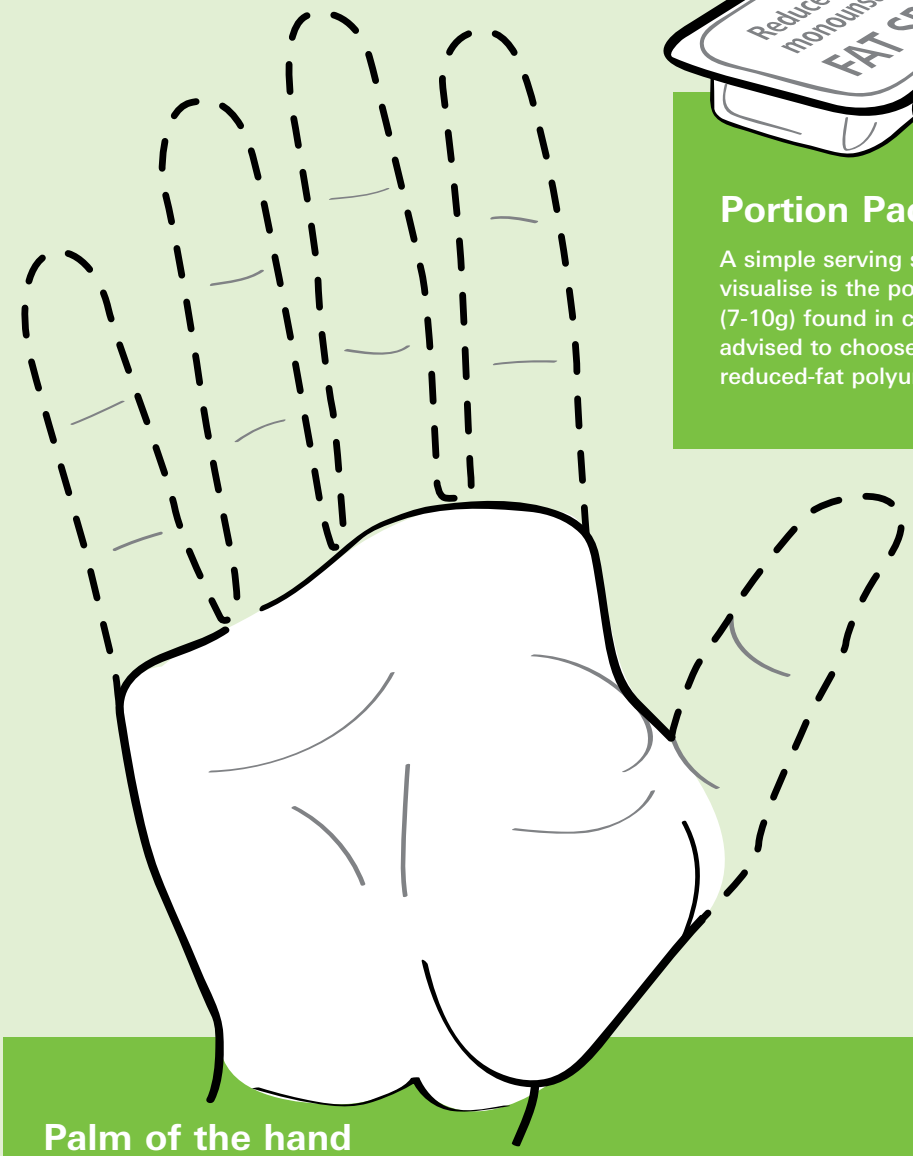


The 5ml teaspoon is another common household measure which is used in this guide to describe foods such as peanut butter. Other simple serving size descriptions that are easy for people to visualise includes the matchbox size piece of cheese and the portion pack of fat spread found in cafes and restaurants.

6. Portion Size Reference Guide

Portion Pack

A simple serving size description that people can visualise is the portion pack of fat spread or butter (7-10g) found in cafés and restaurants. People are advised to choose reduced-fat monounsaturated or reduced-fat polyunsaturated spreads more often.

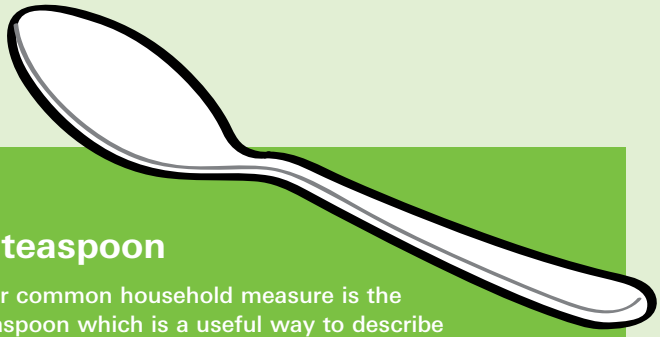


Palm of the hand

Consumers favoured the 'palm of the hand' as an indicator of main meal serving size for meat, poultry and fish. The width and depth of the palm of a hand (without fingers and thumb) roughly indicates the amount of these foods needed for a whole day. Most of this can be used for the main meal, with the remaining smaller amount used for the light meal. Therefore, the size of the 'palm of the hand' roughly indicates what is **more than enough** for a main meal.

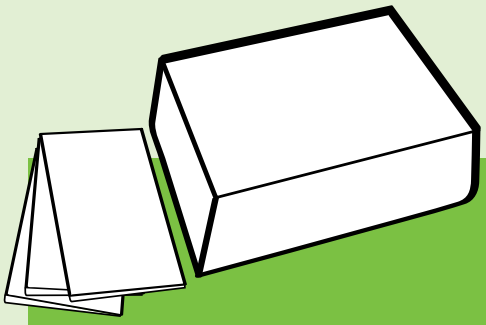
200ml Disposable Cup

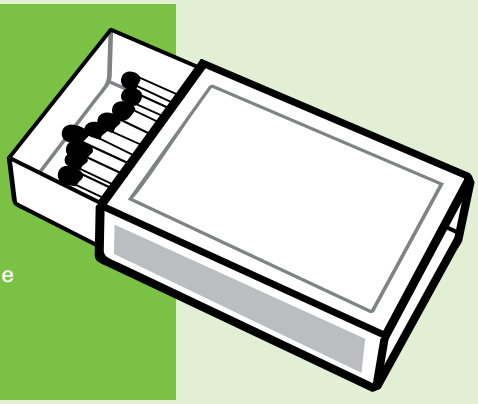
When consumers were shown a plastic disposable cup (200ml), most agreed that this was the best way to describe servings of many foods such as cereal, cooked pasta, cooked rice, cooked or tinned fruit and cooked vegetables and pulses (peas, beans, lentils).



5ml teaspoon

Another common household measure is the 5ml teaspoon which is a useful way to describe foods such as peanut butter which provides a light meal serving from the Meat, Fish and Alternatives Food Group.





Matchbox Size Piece of Cheese

Another simple serving size description that is easy for people to visualise is the matchbox size piece of cheese.

7. Your Daily Recommended Number of Servings from Each Food Group for Active Living

	Children 5-13		Teens 14-18		Adults 19-50		Adults 51+	
	Boys	Girls	Boys	Girls	Men	Women	Men	Women
Bread, Cereal and Potatoes Choosing the right amounts is crucial for a healthy weight. Wholemeal and wholegrain provide the best energy. If you are not active you need to eat fewer servings.	NO. OF SERVINGS *ACTIVE*		NO. OF SERVINGS *ACTIVE*		NO. OF SERVINGS *ACTIVE*		NO. OF SERVINGS *ACTIVE*	
	3-5	3-4	5-7	4	5-7	4-5	4-5	3-4
			SEDENTARY		*SEDENTARY*		*SEDENTARY*	
			4-5	3	4-6	3-4	4	3
Fruit and Vegetables Provide lots of protective nutrients, yet are low in calories.	NO. OF SERVINGS		NO. OF SERVINGS		NO. OF SERVINGS		NO. OF SERVINGS	
	5	5	5-6	5	5-7	5-6	5	5
Milk, Yoghurts and Cheese Great for calcium and healthy bones. Low-fat is best – choose milk and yoghurt more often than cheese.	NO. OF SERVINGS		NO. OF SERVINGS		NO. OF SERVINGS		NO. OF SERVINGS	
	3-5	3-5	5	5	3-5	3	3	3
Meat, Fish and Alternatives Good sources of protein and iron. Oily fish is great for your heart and bones. Lean is best.	MAIN MEAL SERVING		MAIN MEAL SERVING		MAIN MEAL SERVING		MAIN MEAL SERVING	
	1	1	1	1	1	1	1	1
	LIGHT MEAL SERVING		LIGHT MEAL SERVING		LIGHT MEAL SERVING		LIGHT MEAL SERVING	
	1	1	1-2	1	1-2	1	1	1

Fat Spreads and Oils

All fat spreads and oils are very high in calories – use sparingly.

Reduced fat is best.

Margarines and butter - **use a reduced-fat spread sparingly** and choose one that is monounsaturated or polyunsaturated. Use butter less often.
Use oils sparingly - oils such as sunflower, safflower or corn oil are rich in polyunsaturated fats, whilst olive oil, canola and peanut oil are mainly monounsaturated.

Other Foods

These foods are high in calories, fat, sugar and salt and need to be limited.

Sugar, jams, marmalades and honey

- sugar can be taken sparingly to sweeten high-fibre nutritious foods such as stewed fruit and wholegrain cereals, e.g. porridge
- jams, marmalades and honey can sometimes replace fat spread on wholemeal bread.

8. What is One Serving?

Bread, Cereal and Potatoes

Each of the following counts as **one** serving.

Some foods are higher than others in calories – use the guide to **choose wisely** for a **healthy weight**.

The **more** active you are – the **more** servings you need. If you are **not** active – eat **fewer** servings.

Wholemeal and **wholegrain** are the **best** choice for fibre-rich **healthy** calories.*

	CEREALS	BREADS	
100 – 135 CALORIES	⅓ cup raw porridge oats	1 slice soda bread*	1 slice batch loaf*
135 – 160 CALORIES	2 whole-wheat breakfast cereal biscuits*	2 regular slices pan bread*	1 oval pitta bread*
160 – 190 CALORIES	½ cup muesli*	1 tortilla bread* (for wrap)	5 inch (13cm) baguette roll* (approx. ½ lunch size baguette roll)
190 – 220 CALORIES	1½ cups cereal flakes*	2 "thick cut" slices pan bread*	1 bagel*

Fruit and Vegetables

Each of the following counts as **one** serving. To get all the goodness you can from fruit and vegetables, choose a variety of colours.

Each counts as **one** serving but more is better.

FRUIT			VEGETABLES
1 medium apple	2 small kiwis	16 blackberries (⅔ cup)	½ cup cooked carrots/parsnip/tu
1 medium orange	2 small plums	16 raspberries (⅔ cup)	½ cup cooked broccoli/cauliflowe
1 medium peach	2 small mandarins/satsumas	4-6 strawberries (1 cup)	½ cup cooked cabbage/kale/spin
1 medium banana	2 small passion fruits	½ cup blueberries	½ cup celery/leeks
1 medium pear	2 small apricots	10 grapes (½ cup)	½ cup courgette/aubergine
½ grapefruit	1 large/2 small slices pineapple	10 cherries (½ cup)	½ cup peppers/mushrooms
⅔ cup stewed fruit – no added sugar (apple, pear, rhubarb)	½ mango	½ cup prunes/apricots stewed – no added sugar	½ cup asparagus/mangetout
	1 large slice melon		1 cup chunky vegetable soup (pre

Milk, Yoghurts and Cheese

Choose low-fat milk and yoghurt more often than cheese.

1 cup low-fat milk (about 240mg calcium)	1 cup full-fat milk (about 240mg calcium)	¾ cup natural yoghurt – *low-fat is best* (about 260mg calcium)	¾ cup 'diet' yoghurt (about 260mg calcium)	1 cup f *low-fat* 210mg
1 cup skimmed milk (about 240mg calcium)	1 cup flavoured milk – *low-fat is best* (about 230mg calcium)	¾ cup fruit yoghurt – *low-fat is best* (about 260mg calcium)	1 cup natural yoghurt drink – *low-fat is best* (about 210mg calcium)	1 cup fl drink – (about

Meat, Fish and Alternatives

Lean is best.

MAIN MEAL				
Lean cooked meat, e.g. beef, pork, lamb: the size of *the palm of your hand is more than enough*	Lean cooked poultry, e.g. chicken or turkey without skin: the size of *the palm of your hand is more than enough*	Fish- a medium cooked fillet the size of *the palm of your hand is more than enough*	Cooked peas, beans, lentils – ¾ cup	Eggs – 2 eggs

Fat Spreads and Oils

Reduced fat is best.

One portion pack of reduced fat polyunsaturated or monounsaturated spread is more than enough for 1 slice of bread. Try to make it do for 2.	Oils are healthier than solid fats, but are just as fattening. Choose cooking methods such as grilling or baking more often. When oil is used in cooking, use sparingly.

Other Foods

You can enjoy healthy eating with minimal amounts of these foods – NOT too much and NOT too often.

Cakes, biscuits, savoury snacks and confectionery – are high in fats (saturated fat and trans fats) and calories, which should be limited.

Sugar, jams, marmalades and honey add extra calories without essential nutrients.

LIMIT THESE OTHER FOODS TO SOMETIMES BUT NOT EVERY DAY

See section on 'Other Foods' in following pages for typical calorie content of 'other foods'.

		POTATO, PASTA, RICE ETC.			
	1 medium bread roll*	1 medium sized boiled or baked potato	3 scoops mashed potato (adding only low-fat milk)	1 cup cooked pasta shapes*	⅔ cup sweet corn (⅔ small 150g tin)
	6 wholemeal crispbread or crackers*	1 cup yam or sweet potatoes (boiled and mashed)	1 cup cooked basmati rice*		
	½ panini bread or ½ ciabatta roll	8 baby potatoes	1 cup cooked "easy cook" white rice	1 cup cooked brown spaghetti*	1 cup cous cous / quinoa
	2 round pitta bread*		1 cup cooked brown rice	1 ½ cup wholewheat noodles	

		SALAD (1 cup of any salad vegetables)
rnip	½ cup cooked peas	lettuce
er	½ cup green/French beans	tomatoes
ach/brussels sprouts	½ cup cooked lentils (green, brown, red)	onion (scallions, red and white onions)
	½ cup red kidney beans	cucumber
	½ cup cooked chick peas	radishes
	½ cup broad beans	beetroot
	½ cup runner beans	watercress
eferably homemade)	½ cup baked beans	any raw vegetables

OTHER FRUIT
Each of these also count as **one** serving. But no matter how many of these you eat, only count each as **one** of your daily servings.
¾ cup fruit juice/smoothie
⅔ cup stewed fruit + sugar (apple, rhubarb)
⅔ cup tinned fruit (e.g. fruit cocktail, pear)
½ avocado
¼ - ½ cup dried fruit (prunes, apricots, sultanas, dates etc)

ruit yoghurt drink – *is best* (about calcium)	¾ cup natural pouring yoghurt – *low-fat is best* (about 200mg calcium)	1 matchbox-size piece of hard cheese e.g. cheddar – *choose reduced-fat cheddar or lower-fat hard cheeses, such as Edam, more often* (about 240mg calcium)	1 cup cottage cheese – *choose reduced fat varieties* (about 250mg calcium)	¾ cup custard made with low-fat milk (about 200mg calcium)
lavoured yoghurt *low-fat is best* 210mg calcium)	¾ cup flavoured pouring yoghurt – *low-fat is best* (about 200mg calcium)	1 matchbox size piece of soft cheese e.g. camembert cheese or brie – *choose lower fat versions more often* (about 220mg calcium]	1 cup rice pudding made with low-fat milk (about 200mg calcium)	1 cup semolina made with low-fat milk (about 240mg calcium)

LIGHT MEAL					
Lean cooked meat, e.g. beef, pork, lamb: 1 small slice	Lean cooked poultry, e.g. chicken, turkey: 1 small slice	Fish- small portion cooked or tinned the size of half *the palm of your hand*	Cooked peas, beans, lentils – ½ cup	Nuts – handful of unsalted nuts or small portion of peanut butter (1-2 teaspoons)	Eggs – 1 egg

<< Please Open

9. How are Food Servings Counted in a Meal?

Here is an example

Beef stew with vegetables, stewed fruit and yoghurt

Lean, cooked beef, roughly the size of the palm of your hand (fat removed)	= 1 larger serving from the meat and alternatives group
3 scoops of mashed potatoes	= 1 serving from the bread, cereal and potato group
½ cup of peas, carrots, cauliflower	= 1 serving from the fruit and vegetables group
½ cup of stewed apple	= 1 serving from the fruit and vegetable group
¾ cup low-fat yoghurt	= 1 serving from the milk and dairy group

10. Breads, Cereals and Potatoes

Breads, cereals, potatoes pasta and rice – the right amount of these foods are crucial for maintaining a healthy weight. Choose wholemeal or wholegrain varieties more and check the servings often.

Foods in this group are extremely important - they provide the best kind of calories (energy) for a healthy weight and prevention of heart disease and cancer. They are also a big provider of fibre and B vitamins.

These foods should be included in all our meals, and remember brown is best because brown wholemeal cereals and bread provide fibre. Wholemeal foods contain all three parts of the cereal grain – the starchy core, the germ and the bran. Examples of these foods include high-fibre breakfast cereals, wholemeal breads and crackers or crispbreads, as well as oatmeal (porridge).

Why Brown is Best

These high fibre foods help to protect against bowel diseases such as diverticular disease and bowel (colon) cancer. Including plenty of wholemeal and wholegrain varieties of these foods helps to keep bowel movements regular and therefore, these foods are important to help avoid constipation.

Carbohydrates (carbs) are Essential when Watching Weight

Low carbohydrate diets are not good for health. Wholemeal breads, cereals and potatoes provide the best energy (calories) for the body to work so people should not be tempted to cut these important foods from the diet. Different types of breads and rolls can be used for variety, but be aware that some types may contain more calories than others. Two slices of 'thick cut' pan bread or a bagel for instance, contain almost twice the calories as a bowl of porridge or a medium potato. Choose wisely from the wide range of food options available in this group. Porridge is a great way to start the day as it is very filling and low in calories. Muesli on the other hand tends to be high in calories.

Similarly, the calorie content of a cup of rice varies depending on the type and how heavy it weighs. For instance, a cup of brown rice will provide more calories than a cup of basmati rice as brown rice is heavier.

So, for a step in the right direction, people can be advised to:

- Never skip meals, breakfast is especially important
- Choose porridge or another high-fibre cereal for breakfast
- Switch from white bread to wholemeal bread

11. Fruit and Vegetables

To get all the goodness you can from fruit and vegetables choose a variety of colours – at least 5 a day.

Fruit and vegetables are so important because they are 'protective' foods, i.e. they help prevent some common diseases such as heart disease and even some cancers. Fruit and vegetables provide fibre as well as a whole array of beneficial vitamins and minerals such as vitamin C, the B vitamins, potassium and magnesium. In addition, dark green vegetables like spinach and broccoli contain folate and vitamin E, whilst orange/red fruit and vegetables provide carotenes (a form of vitamin A). Fruit and vegetables also provide a wide variety of other substances called phytochemicals, flavonoids and phytoestrogens which are thought to be protective.

To get the most from fruit and vegetables, people should eat a variety of different coloured fruit and vegetables often. People should choose:

- Dark green vegetables such as broccoli, spinach, cabbage
- Orange/red fruit and vegetables such as oranges, tomatoes, carrots, red/orange/yellow peppers

Fruit is filling, fairly low in calories and contains no fat, and is a great choice for an in-between meal snack. Fruit can also be whisked with a glass of reduced-fat milk to make a smoothie. However, having whole fruit provides more fibre, is more filling and always a better choice than a drink of unsweetened juice. More than 1 glass of juice still only counts as one serving.

Cooking affects the goodness contained in vegetables, so over-cooking should be avoided as many vitamins are lost this way. Steaming, microwaving or stir-frying (small amounts of oil) are great ways to cook vegetables. Vegetable intake can be boosted by adding a good helping of salad (lettuce, onion, tomato) to sandwiches.

Frozen or tinned vegetables are just as good as fresh. Old favourites like baked beans on toast make a great nutritious meal. Tinned vegetables packed in brine should be limited because they are high in salt.

12. Milk, Yoghurt and Cheese

Low-fat is best. Choose low-fat milk and yoghurt more often than cheese.

Milk, yoghurt and cheese are all dairy foods and they provide calcium which is needed for good bone health. However, the fat contained in these foods is mainly saturated fat (animal fat) which can raise blood cholesterol, which in turn, can contribute to heart disease. Therefore, the best choices from this food group to include daily are reduced-fat or low-fat milks and yoghurts. These still contain calcium but contain very little saturated fat. Milk is one of the most complete foods, providing the body with most of the nutrients it needs. Foods in this group are also a good source of B vitamins, such as riboflavin, B12, vitamin A and protein.

Calcium is vital for keeping bones healthy and strong throughout life (physical activity and vitamin D are also of great importance for bone health). During growth in childhood and in the teen years, a good supply of calcium is needed to build healthy bones. At puberty, which can begin as early as 9 years, until the age of 18 years, 5 servings from the milk, yoghurt and cheese group are necessary to meet calcium needs.

Men aged 19 to 50 years will also be able to eat more than 3 servings from this food group. This is not because they need the extra calcium, but because they have higher energy needs and low-fat dairy foods are a good nutritious source of calories.

People need to be careful as they get older too. After about 30-35 years, bones gradually weaken but from about 50 years onwards, this weakening process accelerates. This can be slowed by getting enough calcium from dairy foods. This can help to lower the chances of getting a bone fracture.

Cheeses, (especially full-fat cheese) are rich in fat. They can add variety, but people should avoid overdoing it. Having cheese a few times a week is better than every day. When cheese is eaten, reduced-fat cheeses like Edam or Blarney or reduced-fat cheddar are better choices. Some soft cheeses like cottage cheese are low in fat, but these are fairly low in calcium too so serving sizes tend to be larger.

Foods like fromage frais and ice-cream contain lower quantities of calcium compared to yoghurts or milk. In addition, they have the disadvantage of being higher in fat.

THE BEST DAIRY FOODS TO INCLUDE DAILY ARE LOW-FAT MILK AND YOGHURTS.

13. Meat, Poultry, Fish and/or Alternatives

Choose lean meat, poultry, fish and/or alternatives.

Beef, lamb, pork, poultry and fish all provide protein as well as iron. Too little iron in the diet can be a problem particularly for those who are growing (children, teenagers and pregnant women) or who have higher needs (girls and women due to menstruation). If the body's stores of iron become reduced, this can lead to anaemia, causing tiredness and increased susceptibility to infection.

Although men aged 19 to 50 years and teenage boys do not need extra iron, they do have the highest energy needs. Therefore, they may sometimes have an extra small serving from this food group, for example, an extra small slice of lean meat or chicken in a sandwich.

Red meat such as beef and lamb are the best sources of iron. Pork and poultry are also good sources, and there is some iron in fish. These animal sources of iron are very well absorbed by the body. Eating lean red meat about three times per week can help prevent low iron levels and anaemia. Some plant foods (pulses and cereals) also contain iron, but it is present in a different form which the body finds less easy to absorb. Having vitamin C (in the form of a citrus fruit or juice, e.g. orange) with these foods increases the absorption of iron from them.

Meat contains saturated fat (animal fat), which can raise blood cholesterol, which in turn can contribute to heart disease.

- Lean cuts of meat or lean mince are best and visible fat should be removed from meat and skin removed from poultry.
- Luncheon meats, processed meats and sausages are generally higher in fat and so should be limited. Ham and other salty meats should also be limited.

- Meat, poultry, fish and other foods can be cooked by grilling, baking, stewing or steaming instead of frying or deep-frying. Meat dishes such as stews and casseroles can be bulked up by adding vegetables or pulses (peas, beans or lentils) to help stretch meat further. This also makes the dish lower in fat and calories but higher in fibre, vitamins and minerals.
- Peas, beans and lentils are a great low-fat protein, high fibre alternative to meat.
- People should try to eat fish twice a week, including oily fish at least once per week. Oily fish such as salmon, herring, mackerel or sardines provide omega-3 fatty acids which are good for heart health and are important during pregnancy for the baby's brain and eye development.
- Eggs should be limited to no more than 7 per week.

14. Fat Spreads and Oils

What type? – polyunsaturated and monounsaturated spreads and oils are best for your heart.

Getting the Fat Balance Right

Some fat is needed in the diet, but it is a case of getting the balance right. People need to eat less saturated fat and *trans* fats, and replace some of these fats with monounsaturated and polyunsaturated fats.

Saturated fats (animal fats) raise harmful blood cholesterol which contributes to heart disease. Foods high in saturated fat include butter, hard margarines, cream, full-fat dairy products, fat on meat, skin on poultry, fatty meats and sausages as well as pies, pastries, cakes, biscuits, savoury snacks and confectionery.

Similarly, ***trans* fats**[3] raise harmful blood fats and reduce the beneficial blood fats. *Trans* fats are produced when oils are changed to solid hard fats during food processing, and can be present in foods cooked in fast-food outlets. Other foods likely to contain harmful *trans* fats include hard margarines and foods made from them such as biscuits, cakes, pies, pastries, chocolate, savoury snacks and confectionery.

[3] *Trans* fats are also known as hydrogenated (or partially hydrogenated) fats or hydrogenated (or partially hydrogenated) vegetable oils

To Help Reduce the Intake of Saturated Fat and *Trans* Fats, it is Best to Choose:

- Oils that are high in monounsaturates or polyunsaturates
- Reduced-fat monounsaturated or polyunsaturated spreads
- Reduced-fat milk, yoghurts and cheese
- Lean meats (no visible fat) and poultry without skin and
- Limit cream, fatty meats and sausages, pies, pastries, cakes, biscuits, chocolate, savoury snacks and confectionery

Unsaturated fats (monounsaturated and polyunsaturated fats) can be used to help to keep the heart healthy by lowering cholesterol levels and having other beneficial effects. Examples of monounsaturates include olive, peanut and canola oils or margarines made from these. Examples of polyunsaturates are sunflower, safflower and corn oil or margarines made from these. It is possible to get a mix of monounsaturated and polyunsaturated fats by choosing a reduced-fat monounsaturated spread if you use a polyunsaturated oil and vice versa.

It is important to remember that full-fat unsaturated spreads are just as high in calories as butter; unsaturated oils contain exactly the same calories as other oils.

IT IS IMPORTANT TO REMEMBER THAT FULL-FAT UNSATURATED SPREADS ARE JUST AS HIGH IN CALORIES AS BUTTER; UNSATURATED OILS CONTAIN EXACTLY THE SAME CALORIES AS OTHER OILS.

PLANT STEROL OR PLANT STANOL CONTAINING SPREADS FOR REDUCING CHOLESTEROL ARE ONLY SUITABLE FOR SOME PEOPLE WITH HIGH-CHOLESTEROL LEVELS. THESE SPREADS ARE NOT SUITABLE FOR CHILDREN OR PREGNANT WOMEN.

How Much? Use Reduced-fat Spreads and Oil Sparingly

Although polyunsaturated and monounsaturated fat spreads and oils are better for health than saturated fat, remember that they contain exactly the same amount of calories. Adults in particular, need to be careful about how much is eaten to help control body weight.

It is best to choose a reduced-fat spread and to spread it lightly on breads and rolls. Reduced-fat spreads have extra water added to them during processing to bulk them up so that the amount of fat is reduced. Full-fat poly- or monounsaturated fat spreads can be used if you are active and are not overweight.

To help limit the amount of oil used, people should be advised to grill, bake, steam, stew and boil foods, whenever possible. Oil should be used sparingly in cooking.

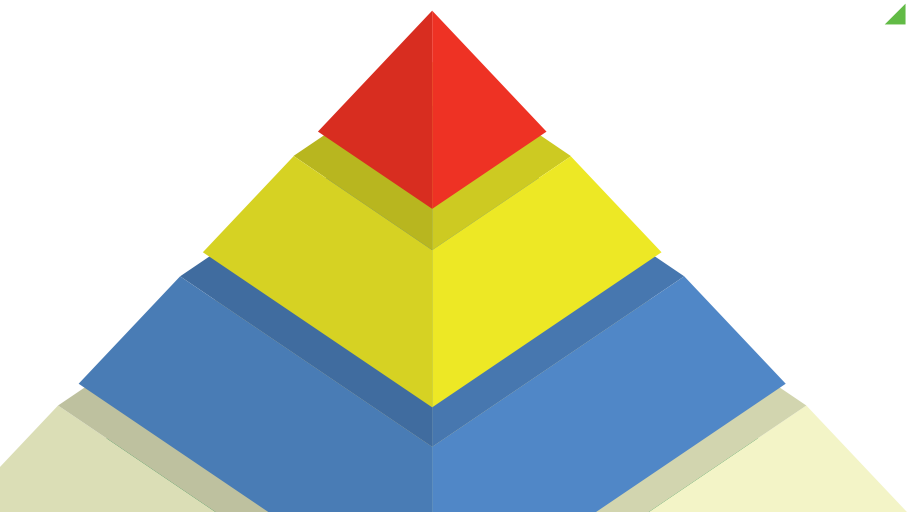
15. 'Other Foods'

Healthy eating can be enjoyed with limited amounts of 'other foods' like biscuits, cakes, savoury snacks and confectionary. These foods are rich in calories, fat, sugar and salt so remember – NOT too much and NOT too often.

Biscuits, cakes, savoury snacks and confectionary can be enjoyed as part of a healthy diet, but it is important to restrict their consumption. They have the disadvantage of being high in calories, fat, saturated fat and trans fats but without the vitamins and minerals we need. These foods should be limited to sometimes, but not every day.

Having less of these foods is another positive step towards healthy eating – the following table shows how many calories are contained in some commonly eaten snacks, and some alcoholic drinks:

Foods	Calories Per Portion	Disadvantages
1 packet crisps (25g)	133 calories	Salty and high in fat
2 wholegrain biscuits	140 calories	High in fat and saturated fat
1 large chocolate muffin	370 calories	High in fat, saturated fat and sugar
2 scoops ice-cream	212 calories	High in fat and saturated fat
1 slice apple tart	288 calories	High in fat and saturated fat
Average chocolate bar (50g)	260 calories	High in fat, saturated fat and sugar
1 glass wine (1/8 bottle)	93 calories	Alcohol
1 pint beer	172 calories	Alcohol



Sensible Snacking for Weight Control

Extra fruit and vegetables - filling up on these foods will not increase weight. **Still hungry?** Extra cereal, yoghurt or milk (nutritious calories) make a good choice. Biscuits, cakes and confectionery should be the last option. These foods are high in fat and calories but are not filling.

The Place of Sugar in Healthy Eating – Getting the Balance Right

Sugar can be taken sparingly to sweeten high fibre, nutritious foods such as stewed fruit and wholegrain cereals such as porridge. A little jam or marmalade can also sometimes replace fat spreads on wholemeal breads in order to help lower fat intakes.

However, excessive consumption of sugar, for example, in the form of sugary drinks should be avoided. Very high intakes may lead to a higher calorie intake.

It is important to limit how often sweet and sticky foods and drinks are taken throughout the day for the prevention of tooth decay. Therefore, soft drinks, cordials and sweetened juices should be limited. Although 'diet' soft drinks (sugar-free) can be used sometimes for variety, they are acidic and if taken too frequently, they can still harm teeth. Remember that water is the safest drink for teeth.

Alcohol is High in Calories but is not a Food

If alcohol is taken, care should be taken to drink sensibly by setting limits and never bingeing. The upper limits are:

- 21 standard* drinks per week for men
- 14 standard* drinks per week for women

These upper limits are not targets to be reached. Even at these limits, alcohol can harm health. Limit alcohol on each drinking occasion by including non-alcoholic drinks as far as possible.

***ONE STANDARD DRINK IS EQUAL TO A HALF PINT OF BEER, LAGER OR STOUT, ONE SMALL GLASS OF WINE OR ONE MEASURE OF SPIRITS. A FULL BOTTLE OF WINE IS EQUAL TO 7½ - 8½ STANDARD DRINKS.**

ALCOHOL SHOULD BE AVOIDED DURING PREGNANCY AND WHILST BREAST-FEEDING. IT SHOULD ALSO BE AVOIDED BY THOSE TRYING FOR A BABY.

16. Everyone should be Active to be Healthy

Balance your food with active living to help protect against disease and prevent weight gain.

The benefits of active living **for everyone** are enormous. These positive effects on health, (even if not overweight), include better protection against:

- Heart disease
- Stroke
- Diabetes
- Some forms of cancer
- Osteoporosis

As well as all these benefits, active living is also great for the mind. Being regularly active is key for good mental health, as exercise is proven to reduce stress and boost your sense of well-being.

Being Active for Adults Means:

- Taking part in a minimum of 30 minutes of moderate activity on at least 5 days of the week
- To help lose weight, taking part in at least 60-75 minutes of moderate activity per day
- To help keep weight off after weight loss, taking part in about 60-90 minutes of moderate activity per day

Examples of moderate activity for adults include: brisk walking, gardening, medium-paced cycling or swimming or even housework.

THOSE WORRIED ABOUT THEIR LEVEL OF FITNESS OR THOSE WHO HAVE NOT BEEN ACTIVE FOR SOME TIME, SHOULD SEEK ADVICE FROM THEIR DOCTOR ABOUT HOW TO INCREASE THEIR ACTIVITY LEVELS SAFELY.

Being Active for Children and Young People Means:

- Taking part in a minimum of 60 minutes of moderate to vigorous activity every day

Examples of vigorous activity for children and young people includes running, swimming, cycling, skipping with a rope, basketball, football or martial arts.

Tips for Being Active in Everyday Living:

- Spend more time outdoors with the family, in the park or playground. Remember active parents have active kids
- Walk or cycle short distances instead of taking the car, e.g. to school, to work or to the shops
- Seek activities that are enjoyable, e.g. dancing, walking with friends or martial arts instead of going to the gym
- Get off the bus or train one stop earlier and walk the rest of the way to work or home
- Take the stairs rather than the lift or escalator
- Take the dog for regular walks

Balancing Food with Active Living to Prevent Weight Gain

Excess weight gain is a problem for many people that can contribute to health problems such as heart disease, diabetes and even some cancers. Controlling body weight is a balancing act. The body turns food eaten into fuel and the more active an individual, the more fuel is used up. When an individual is not active enough, what is left over will be stored in the body as fat.

These days, there is far more access to a huge range of foods than before, some of which are high in fat and available in increasingly larger serving sizes. People also tend to eat out more often* and foods served in restaurants can often be cooked with extra fat. In addition to this, more time is spent in front of a television or computer screen and on the whole, people are not as active as they should be.

Eating nutritious foods, (by following the healthy eating advice outlined in this guide) has to be balanced with being active in everyday living to keep weight under control. Small amounts of activity, even just moving around instead of sitting, or putting extra vigour into household cleaning can all add up. It is important to find an activity that is enjoyable and fits in with a person's lifestyle, e.g. going for a brisk walk with a friend or walking the kids to school.

*** Eating Out**

When eating out, advise people to choose lower fat options. Go for grilled or baked meats and fish rather than fried; choose baked potato rather than fries; pastas in tomato sauce rather in creamy sauces; ask for sauces and dressings to be left out or served on the side; opt for fruit or sorbets for dessert rather than cream-based desserts.

Fuelling activity

Choosing more servings from the Bread Cereals and Potato Food Group is the ideal way to increase intake when a person is becoming more regularly active. These foods provide the best source of calories or energy to fuel the body, as well as fibre, vitamins and minerals. They also help satisfy the appetite.

FOR CHILDREN AND ADOLESCENTS, BALANCING ACTIVE LIVING WITH FOOD FOR ADEQUATE GROWTH AND DEVELOPMENT IS THE MOST IMPORTANT PRIORITY.

17. Drink Plenty of Water

Water is essential for life. It is necessary to absorb nutrients from food, carry nutrients around the body and to get rid of the waste products from the body. Through perspiration (sweating), the body uses water to lower body temperature when it is warm.

Regular drinks are necessary to replace fluid lost during the day. Without enough water or fluid in the short-term, the dehydration that results causes tiredness. In the long-term, drinking enough water or fluids may be important to help prevent kidney stones. Elderly people need to be especially careful to drink enough as the sensation of thirst can decline in later life, and they may drink less than they need.

- Adults need 8-10 cups of fluid every day. Most of this comes from food itself (all food contains water) and drinks such as tea, coffee, milk as well as water.
- Water is the safest drink for our teeth. 'Diet' soft drinks (sugar-free) can sometimes be taken for variety, but not too often. This is because the acid they contain can still be harmful to teeth if taken too frequently.
- The more active a person is, the more fluid is needed to replace fluid lost as sweat.
- Water is great for quenching thirst, but it is better to drink enough before thirst is registered, as thirst can be a sign that dehydration is already happening.

18. Limit Your Salt Intake

Eating too much salt can contribute to raised blood pressure, which can in turn lead to stroke or heart disease. Cutting back on salt in the diet, along with other important measures such as eating plenty of fruit and vegetables, not drinking too much alcohol, being active, and controlling body weight can all help to keep blood pressure in check.

Many foods which are relied on every day, such as breakfast cereals, margarines, and breads **already** contain a significant amount of salt. Of course, these foods play a very important role in healthy eating as they provide a lot of vital nutrients. However, there are steps that can be taken to lower the amount of salt eaten.

Top Tips for Limiting Salt:

- Avoid adding salt to foods during cooking and also avoid having salt at the table
- Our sense of taste adapts well to eating less salt, and after a while, it becomes easy to enjoy food without adding it
- Flavour food with pepper, herbs and spices
- Use fruit to make tasty sauces for meat and poultry, e.g. apple or cranberry sauce, or fruit juices with fish, e.g. lemon juice
- Avoid putting salt out on the table at mealtimes (low-sodium salt substitutes are not recommended)

IT IS ESPECIALLY IMPORTANT TO AVOID GIVING CHILDREN THE SALT HABIT. DO NOT ADD SALT TO THEIR FOODS DURING COOKING AND KEEP SALT OUT OF SIGHT AT THE TABLE.

To Help Lower Salt Intake, there are many Foods that can be Limited

These include:

- Salty, smoked and cured meats, e.g. ham, bacon
- Stock cubes, instant gravies, packet soups and sauces
- Savoury snacks, e.g. crisps, salted nuts, pretzels
- Ready-meals and take-aways
- Foods tinned in brine
- Smoked cheeses

Check Labels for Salt Content

Adults should consume no more than 6 grams of salt or 2.4 grams of sodium per day (children under 11 years should have far less). Food labels list salt as either salt or sodium chloride. To convert salt to sodium, divide by 2.5 and to convert sodium to salt, multiply by 2.5.

For example:
1 grams of salt = 0.4 grams sodium
0.8 grams of sodium = 2 grams of salt

19. Eating Well during Pregnancy and Breastfeeding

It is important to follow the advice contained in this 'food guide' to get all the nutrients needed for a healthy pregnancy. Doctors may advise some women to take extra iron in the form of a prescribed supplement. Pregnant women may need more calories in the third trimester than usual. This is best provided by including just 1-2 extra servings each day from either the fruit and vegetable *or* the dairy *or* the bread, potatoes and cereal food groups.

For example, have extra fruit and yoghurt for a snack, *or* having an extra slice of toast at breakfast and an extra glass of milk in the evening.

Fish is an important source of many essential nutrients, and should be eaten as part of a healthy, balanced diet. Oily fish, e.g. salmon, sardines, herring and mackerel, provide special fatty acids (long chain omega-3 fatty acids) which are important during pregnancy for eye and brain development in the baby. Women should try to include 2 servings of fish per week – oily if possible.

However, certain types of fish need to be avoided because they contain contaminants such as mercury which may be harmful to the developing baby. For this reason, pregnant women should avoid eating large predatory fish such as marlin, shark and ray. Fresh or tinned tuna may also be higher in mercury than other fish, and so pregnant women should not consume more than 1 serving of fresh tuna weekly, and not greater than two cans (2 × 240g) of tinned tuna per week.

Caffeine in the mother's diet can reach the baby and may be harmful. High caffeine intakes during pregnancy are not advisable, and mothers should aim to keep their caffeine intake below 200mg of caffeine per day. The table below shows the caffeine content of the most common caffeine containing foods and drinks, and will help to ensure the caffeine intake is within recommended limits.

Food or drink	Serving size	Caffeine content
Coffee, brewed	1 cup (200ml)	111mg (range 102-200mg)
Coffee, instant	1 cup (200ml)	78mg (range 27-173mg)
Coffee, decaffeinated	1 cup (200ml)	4mg (range 3-12mg)
Espresso	1 shot (30ml)	40mg (range 30-90mg)
Tea, brewed	1 cup (200ml)	44mg (range 40-120mg)
Cola	1 bottle (500ml)	32mg
Diet cola	1 bottle (500ml)	39mg
Stimulant energy drink	1 can (250ml)	80mg
Dark chocolate	1 bar (45g)	31mg

Information adapted from the Centre for Science in the Public Interest.

The exact amount of caffeine will vary according to cup size, brewing methods and brands of coffee or tea.

NO AMOUNT OF ALCOHOL IS SAFE DURING PREGNANCY, AND SO PREGNANT WOMEN SHOULD AVOID ALL ALCOHOLIC DRINKS.

Good food preparation and hygiene practices are important at all stages of life in order to prevent potentially harmful foodborne illnesses. However, during pregnancy this is particularly important, as certain bacteria in food (such as *Listeria* and *Salmonella*), or parasites (such as *Toxoplasmosis*) can reach the developing baby and can be extremely harmful. To minimise the risk of becoming infected, pregnant women should:

- Avoid unpasteurised milk and any cheese or yoghurts made with unpasteurised milks
- Avoid cheeses which have been ripened by mould, e.g. Camembert, Danish Blue
- Avoid eating deli meats and deli salads, and pre-packed salads and coleslaws
- Avoid smoked fish such as smoked salmon, pre-cooked ready-to-eat meats, cured and smoked meats, e.g. salami
- Wash all raw ingredients such as fruits and vegetables very well before eating
- Keep raw and cooked meats separate, and use different knives, chopping boards and other kitchen utensils when preparing these foods to avoid cross-contamination

- Cook all food well throughout, and serve when still hot
- Ensure fridge temperature is below 5°C, and put food in fridge as quickly as possible
- Always wear gloves when gardening or changing cat litter, and always wash hands very well after these activities

EVERYONE IN IRELAND NEEDS TO ENCOURAGE AND SUPPORT BREASTFEEDING.

Best for Baby

Human milk is the best and most natural food for infants. It provides all the nutrients a baby needs such as protein, carbohydrate, fat, essential fatty acids, vitamins and minerals. In human milk, a mother's immunity to infections (in the form of antibodies) is passed on to the baby offering protection against infectious illnesses. Breastfeeding may even provide protection against some conditions later on in life such as childhood obesity, diabetes and some gastrointestinal disorders.

Human milk:

- Contains cells, hormones and antibodies that fight disease and provide special growth factors
- Has anti-infective agents, which protect against diarrhoea
- Protects against asthma and lung infections
- Protects against eczema

Best for Mothers

Breastfeeding protects the health of the mother too. It helps reduce the risk of breast cancer and ovarian cancer, as well as helping the recovery after childbirth and the return to normal body weight. It also enhances the close relationship between mother and baby.

Healthy Eating for Breastfeeding Mothers

It is important during breastfeeding to have a good diet and to limit consumption of alcohol and stimulants such as caffeine (see table above). The healthy eating advice in this 'food guide' should ensure that all the nutrients needed for mother and baby are obtained. A vitamin D supplement containing 5µg per day, and a folic acid supplement containing 400µg per day should be taken. Breastfeeding mothers may also need extra calories, and so, as for pregnancy, this is best provided as an extra 1-2 Recommended Servings each day, in the form of extra bread or cereal or fruit or milk or yoghurt. Plenty of water is needed as breastfeeding can make a woman very thirsty.

ALL FAMILY MEMBERS, INCLUDING PARTNERS AND GRANDPARENTS AS WELL AS FRIENDS, NEED TO BE INVOLVED BY OFFERING PRACTICAL HELP AND ENCOURAGEMENT TO A MOTHER WHO IS BREASTFEEDING.

20. Prepare and Store Food Safely

Care needs to be taken to ensure that food does not become contaminated with harmful bacteria ('germs') and therefore, unsafe to eat. Correct handling and storage of food is important to minimise the chances of becoming sick from eating unsafe food.

How Germs Cause Illness

The germs that can contaminate food are bacteria and viruses. If they come into contact with food, these germs feed on it and multiply, especially if the temperature is right for them. Eating a contaminated food brings all these germs into the stomach from where they can cause illness.

Some germs produce toxins in the food. When the food is eaten, the toxin causes the problems that follow, rather than the germs themselves. The effects of eating spoiled food vary widely. It may only lead to minor effects in healthy adults, such as an upset stomach. However, symptoms can be more severe and include stomach pains, vomiting and diarrhoea. These can be particularly harmful to pregnant women, the young, the sick and the elderly.

How Does Food Become Unsafe?

Bacteria are present everywhere and so foods should be stored, prepared and cooked safely. There are a number of ways that food can become contaminated.

For example:

- Touching food with unclean hands
- Using dirty kitchen utensils
- Allowing raw foods, such as meat, fish and poultry, to come into contact with cooked foods. This can occur if raw and cooked foods are prepared on the same chopping board or with the same knife. Raw meats stored in the refrigerator can also drip onto cooked foods

The Importance of Temperature

Bacteria thrive in warm temperatures - not too hot, not too cold. Problems can come about when cooked food is kept lukewarm for long periods. Although the bacteria may have been killed when a food was first cooked, it is possible for food to become contaminated again and for the bacteria to grow. At low temperatures, bacteria are still alive but do not multiply in numbers and spoil food. This explains why food keeps longer in the fridge than at room temperature. At high temperatures, bacteria die. If fresh food is well cooked and eaten straight away, it is generally safe to eat.

Tips for Keeping Food Safe

- Always wash hands before preparing or serving food and after handling animals or using the toilet
- Wash everything well after use
- Store raw foods down low in the fridge and check fridge temperatures regularly
- Foods and left-overs that belong in the refrigerator should always be returned there as soon as possible
- Thaw frozen meats in the refrigerator
- Take special care with the storage and handling of seafood and raw meat
- Left-over canned foods should be put into covered containers, stored in the fridge and eaten within a few days
- With packaged food, always pay attention to the ‘use-by’ or ‘best-before’ date
- Do not eat if the date has passed

PART 3

Food Safety
AUTHORITY OF IRELAND

ADVICE FOR CONSUMERS ON HEALTHY EATING AND ACTIVE LIVING IN IRELAND

Guidelines for children over the age of 5 years, teenagers, adults and older adults

ADVICE FOR CONSUMERS ON HEALTHY EATING AND ACTIVE LIVING IN IRELAND

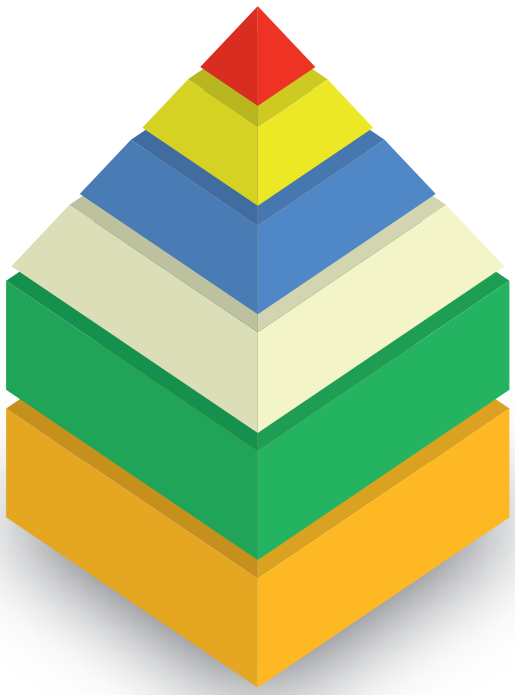
Guidelines for children over the age of 5 years, teenagers, adults and older adults

1. Introduction

We need to eat food in the right amounts and right combinations for healthy eating

Eating a wide variety of nutritious foods, coupled with active living, is the key to maintaining good health throughout life. Active living and eating well go hand in hand. Eating nutritious foods in the right quantity is important for disease and obesity prevention. It also supplies the calories needed for active living. Being active has enormous health benefits for everyone and it is essential to be active at every opportunity and in everything you do as part of your daily routine. Putting extra vigour into housework, going up and down the stairs, playing outdoors with the children, mowing the lawn, washing the car, taking the dog for a walk – this is what is meant by 'active living'.

The information contained in this guide outlines the right types of foods to eat, and how much of them you need to get all of your vitamins and minerals. It also offers you some tips on how to make the best food choices.



EATING PLENTY OF FOODS SUCH AS FRUIT AND VEGETABLES AND CHOOSING WHOLEMEAL VARIETIES OF CEREALS WHERE POSSIBLE, HELP PROTECT AGAINST HEART DISEASE AND CANCER.

2. Guidelines for Healthy Eating

- Enjoy a wide variety of foods from the five food groups.
- Find enjoyable ways to be physically active every day - balancing your food intake with active living will help protect you against disease and prevent weight gain.
- Keep an eye on your serving size – choose smaller serving sizes and add plenty of vegetables, salad and fruit.
- Plain wholemeal breads, cereals, potatoes, pasta and rice provide the best calories for a healthy weight. Base your meals on these simple foods with plenty of vegetables, salad and fruit.
- Eat plenty of different coloured vegetables, salad and fruit – at least five a day.
- Low-fat milk, yoghurt and cheese is best – choose milk and yoghurt more often than cheese.
- Choose lean meat and poultry; include fish (oily is best) and remember, peas, beans and lentils are good alternatives.
- Use polyunsaturated and monounsaturated spreads and oils sparingly – reduced fat spreads are best.
- Grill, bake, steam or boil food, instead of frying or deep frying.
- Healthy eating can be enjoyed with limited amounts of 'other foods' like biscuits, cakes, savoury snacks and confectionary. These foods are rich in calories, fat, sugar and salt so remember – NOT too MUCH and NOT too OFTEN.
- Limit your salt intake.
- Drink plenty of water.
- Everyone should take a daily vitamin D supplement.

  For healthy bones, everyone needs to take a daily vitamin D supplement. A vitamin D3-only supplement is best.

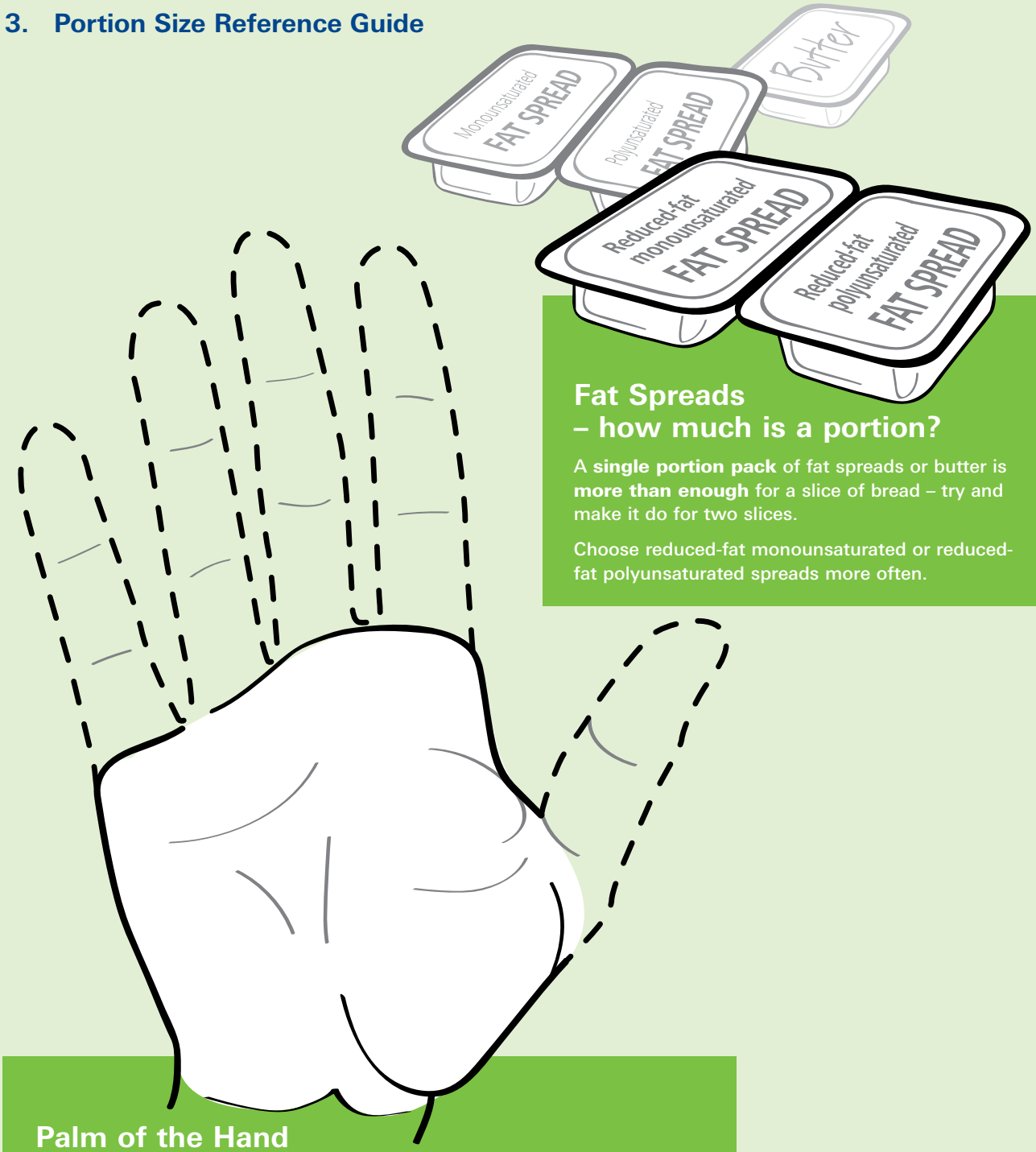
  – 5 micrograms (µg) vitamin D every day is recommended for everyone aged 5 to 50 years.

  – 10 micrograms (µg) vitamin D every day is recommended for everyone aged 51 years and over.

- All women of childbearing age who are sexually active should take a folic acid supplement (400 micrograms (µg)) every day to help prevent neural tube defects (NTDs) in babies, e.g. Spina Bifida.
- Breastfeeding should be encouraged and supported by everyone in Ireland because it gives babies the very best start in life and helps protect women's health.

- Prepare and store food safely.

3. Portion Size Reference Guide



Fat Spreads – how much is a portion?

A **single portion pack** of fat spreads or butter is **more than enough** for a slice of bread – try and make it do for two slices.

Choose reduced-fat monounsaturated or reduced-fat polyunsaturated spreads more often.

Palm of the Hand

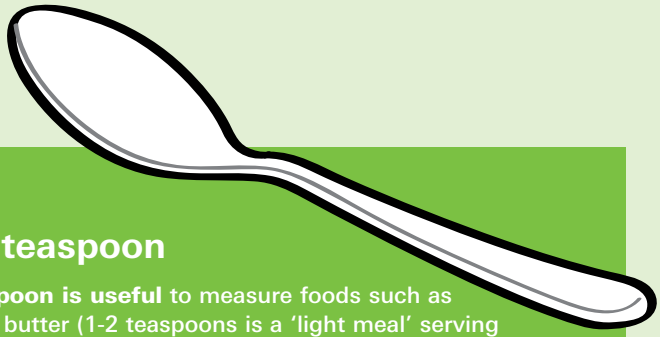
Use the size of the **palm of your hand** as a guide for how much meat, poultry or fish you need in a whole day. Most of this amount can be used for your main meal, with the remaining smaller amount used for your light meal.

Therefore, choosing a portion of meat, poultry or fish that is **roughly the thickness and size of the palm of your hand** (without fingers or thumb) is more than enough for your main meal.

200ml Disposable Cup

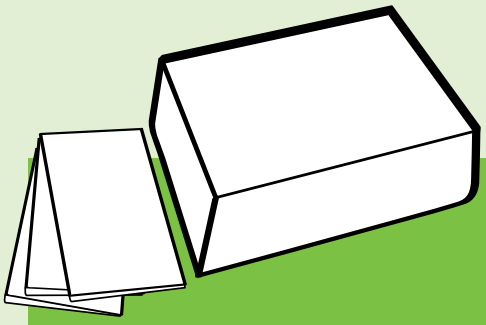
The regular, disposable plastic cup is a **handy way to assess portions of cereals, cooked pasta, cooked rice, cooked vegetables, stewed or tinned fruit**.

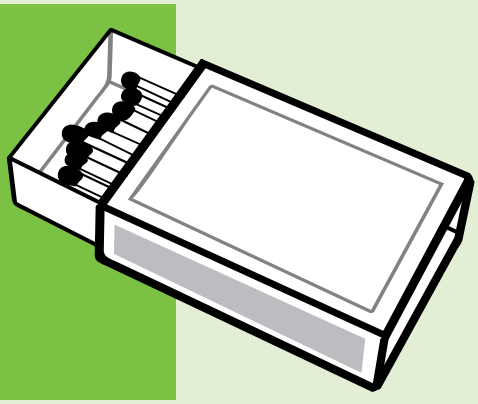
See how much of this cup (½ or 1½) is a portion for these different foods on the next page. Use this cup to find out the amount of these foods that make up a portion. Then, from time-to-time, use the cup to check your portions sizes remain accurate.



5ml teaspoon

A **teaspoon is useful** to measure foods such as peanut butter (1-2 teaspoons is a 'light meal' serving from the Meat Fish and Alternatives Food Group – see next page); or a teaspoon of jam, marmalade or honey, which is more than enough for one slice of bread.





Matchbox Size Piece of Cheese

Think of the size of a **match-box when you are estimating how much cheese** is in a serving.

4. Your Daily Recommended Number of Servings from each Food Group for 'Active Living'

Bread, Cereal and Potatoes

Choosing the **right amounts** is crucial for a **healthy weight**.

The **more** active you are – the **more** servings you need.

If you are **not** active – eat **fewer** servings.

Wholemeal and **wholegrain** are the **best** choice for **healthy** calories.

How many servings do you need every day?

This depends on your age, gender and how active you are.

Boys and girls (5-13 years) need 3-5 servings
(younger, smaller children need less than older, bigger children in this age group)

Teens (14-18 years) need 3-7 servings
(boys need more than girls and active teens need more than inactive teens)

Adults (19-50 years) need 3-7 servings
(men need more than women, and active adults need more than inactive adults)

Older adults need 3-5 servings
(men need more than women, active older adults need more than inactive adults)

If you are **very active** you may need to eat **more** than 7 servings from this food group.

Fruit and Vegetables

Choose a wide variety of colours.

Eat **plenty** of **different coloured** fruit and vegetables - at least **5 servings a day**

Boys and girls (5-18 years) need at least 5 servings

Adults (19-50 years) need at least 5-7 servings

Older adults (51 years+) need at least 5 servings

Milk, Yoghurts and Cheese

Low-fat is best – choose milk and yoghurt more often than cheese.

Choose 3 servings from this food group each day.

Children and teens aged 9-18 years of age need 5 servings each day to meet calcium needs.

Meat, Fish and Alternatives

Lean is best.

Choose 1 main meal and 1 light meal serving each day.

Fat Spreads and Oils

Reduced fat is best.

Fat spreads (margarines and butter) – Use a reduced-fat spread sparingly and choose one that is monounsaturated or polyunsaturated. Use butter less often. Use oils sparingly – oils such as sunflower, safflower or corn oil are rich in polyunsaturated fats, whilst olive oil, canola and peanut oil are mainly monounsaturated.

Other Foods

Cakes, Biscuits, Savoury Snacks and Confectionery
Sugar and Jams, Marmalades and Honey

5. What is One Serving?

Bread, Cereal and Potatoes

Each of the following counts as **one** serving.

Some foods are higher than others in calories – use the guide to **choose wisely** for a **healthy weight**.

The **more** active you are – the **more** servings you need. If you are **not** active – eat **fewer** servings.

Wholemeal and **wholegrain** are the **best** choice for fibre-rich **healthy** calories.*

	CEREALS	BREADS	
100 – 135 CALORIES	⅓ cup raw porridge oats	1 slice soda bread*	1 slice batch loaf*
135 – 160 CALORIES	2 whole-wheat breakfast cereal biscuits*	2 regular slices pan bread*	1 oval pitta bread*
160 – 190 CALORIES	½ cup muesli*	1 tortilla bread* (for wrap)	5 inch (13cm) baguette roll* (approx. ½ lunch size baguette roll)
190 – 220 CALORIES	1½ cups cereal flakes*	2 "thick cut" slices pan bread*	1 bagel*

Fruit and Vegetables

Each of the following counts as **one** serving. To get all the goodness you can from fruit and vegetables, choose a variety of colours.

Each counts as **one** serving but more is better

FRUIT			VEGETABLES
1 medium apple	2 small kiwis	16 blackberries (⅔ cup)	½ cup cooked carrots/parsnip/tu
1 medium orange	2 small plums	16 raspberries (⅔ cup)	½ cup cooked broccoli/cauliflowe
1 medium peach	2 small mandarins/satsumas	4-6 strawberries (1 cup)	½ cup cooked cabbage/kale/spin
1 medium banana	2 small passion fruits	½ cup blueberries	½ cup celery/leeks
1 medium pear	2 small apricots	10 grapes (½ cup)	½ cup courgette/aubergine
½ grapefruit	1 large/2 small slices pineapple	10 cherries (½ cup)	½ cup peppers/mushrooms
⅔ cup stewed fruit – no added sugar (apple, pear, rhubarb)	½ mango	½ cup prunes/apricots stewed – no added sugar	½ cup asparagus/mangetout
	1 large slice melon		1 cup chunky vegetable soup (pre

Milk, Yoghurts and Cheese

Choose low-fat milk and yoghurt more often than cheese

1 cup low-fat milk (about 240mg calcium)	1 cup full-fat milk (about 240mg calcium)	¾ cup natural yoghurt – *low-fat is best* (about 260mg calcium)	¾ cup 'diet' yoghurt (about 260mg calcium)	1 cup f *low-fat* 210mg
1 cup skimmed milk (about 240mg calcium)	1 cup flavoured milk – *low-fat is best* (about 230mg calcium)	¾ cup fruit yoghurt – *low-fat is best* (about 260mg calcium)	1 cup natural yoghurt drink – *low-fat is best* (about 210mg calcium)	1 cup f drink – (about

Meat, Fish and Alternatives

Lean is best.

MAIN MEAL				
Lean cooked meat, e.g. beef, pork, lamb: the size of *the palm of your hand is more than enough*	Lean cooked poultry, e.g. chicken or turkey without skin: the size of *the palm of your hand is more than enough*	Fish- a medium cooked fillet the size of *the palm of your hand is more than enough*	Cooked peas, beans, lentils – ¾ cup	Eggs – 2 eggs

Fat Spreads and Oils

Reduced fat is best

One portion pack of reduced fat polyunsaturated or monounsaturated spread is more than enough for 1 slice of bread. Try to make it do for 2.	Oils are healthier than solid fats, but are just as fattening. Choose cooking methods such as grilling or baking more often. When oil is used in cooking, use sparingly.

Other Foods

These foods are high in calories, fat, sugar and salt and need to be limited

- **you can enjoy healthy eating with minimal amounts of these foods – NOT too much and NOT too often**
- **sugar can be taken sparingly to sweeten high fibre, nutritious foods such as stewed fruit and wholegrain cereals, e.g. porridge**
- **jams, marmalades and honey can sometimes replace fat spreads on wholemeal bread.**

		POTATO, PASTA, RICE ETC.			
	1 medium bread roll*	1 medium sized boiled or baked potato	3 scoops mashed potato (adding only low-fat milk)	1 cup cooked pasta shapes*	⅔ cup sweet corn (⅔ small 150g tin)
	6 wholemeal crispbread or crackers*	1 cup yam or sweet potatoes (boiled and mashed)	1 cup cooked basmati rice*		
	½ panini bread or ½ ciabatta roll	8 baby potatoes	1 cup cooked "easy cook" white rice	1 cup cooked brown spaghetti*	1 cup cous cous / quinoa
	2 round pitta bread*		1 cup cooked brown rice	1 ½ cup wholewheat noodles	

		SALAD (1 cup of any salad vegetables)
rnip	½ cup cooked peas	lettuce
er	½ cup green/French beans	tomatoes
ach/brussels sprouts	½ cup cooked lentils (green, brown, red)	onion (scallions, red and white onions)
	½ cup red kidney beans	cucumber
	½ cup cooked chick peas	radishes
	½ cup broad beans	beetroot
	½ cup runner beans	watercress
eferably homemade)	½ cup baked beans	any raw vegetables

OTHER FRUIT
Each of these also count as **one** serving. But no matter how many of these you eat, only count each as **one** of your daily servings.
¾ cup fruit juice/smoothie
⅔ cup stewed fruit + sugar (apple, rhubarb)
⅔ cup tinned fruit (e.g. fruit cocktail, pear)
½ avocado
¼ - ½ cup dried fruit (prunes, apricots, sultanas, dates etc)

ruit yoghurt drink – *is best* (about calcium)	¾ cup natural pouring yoghurt – *low-fat is best* (about 200mg calcium)	1 matchbox-size piece of hard cheese e.g. cheddar – *choose reduced-fat cheddar or lower-fat hard cheeses, such as Edam, more often* (about 240mg calcium)	1 cup cottage cheese – *choose reduced fat varieties* (about 250mg calcium)	¾ cup custard made with low-fat milk (about 200mg calcium)
lavoured yoghurt *low-fat is best* 210mg calcium)	¾ cup flavoured pouring yoghurt – *low-fat is best* (about 200mg calcium)	1 matchbox size piece of soft cheese e.g. camembert cheese or brie – *choose lower fat versions more often* (about 220mg calcium]	1 cup rice pudding made with low-fat milk (about 200mg calcium)	1 cup semolina made with low-fat milk (about 240mg calcium)

LIGHT MEAL					
Lean cooked meat, e.g. beef, pork, lamb: 1 small slice	Lean cooked poultry, e.g. chicken, turkey: 1 small slice	Fish- small portion cooked or tinned the size of half *the palm of your hand*	Cooked peas, beans, lentils – ½ cup	Nuts – handful of unsalted nuts or small portion of peanut butter (1-2 teaspoons)	Eggs – 1 egg

Cakes, biscuits, savoury snacks and confectionery – are high in fats (saturated fat and trans fats) and calories, which should be limited.

Sugar, jams, marmalades and honey add extra calories without essential nutrients.

LIMIT THESE OTHER FOODS TO SOMETIMES BUT NOT EVERY DAY

See section on 'Other Foods' in following pages for typical calorie content of 'other foods'.

<< Please Open

6. How are Food Servings Counted in a Meal?

Here is an example

Beef stew with vegetables, stewed fruit and yoghurt

Lean, cooked beef, roughly the size of the palm of your hand (fat removed)	= 1 larger serving from the meat and alternatives group
3 scoops of mashed potatoes	= 1 serving from the bread, cereal and potato group
½ cup of peas, carrots, cauliflower	= 1 serving from the fruit and vegetables group
½ cup of stewed apple	= 1 serving from the fruit and vegetable group
¾ cup low-fat yoghurt	= 1 serving from the milk and dairy group

MANY FOODS SUCH AS CEREALS, JUICES, SPREADS AND DAIRY PRODUCTS ARE FORTIFIED, I.E. THEY HAVE EXTRA VITAMINS AND MINERALS ADDED. WHILE THESE FOODS CAN BE USEFUL TO INCREASE YOUR INTAKE OF NUTRIENTS, THEY CANNOT BE RELIED ON TO PROVIDE EXACT AMOUNTS OF THE NUTRIENTS REQUIRED.

7. Fat Spreads and Oils

What type? Polyunsaturated and monounsaturated spreads and oils are best for your heart.

We need some fat in our diet, but it is a case of getting the balance right. We need to eat less saturated fat and trans fats, and replace some of these fats with unsaturated fats such as monounsaturated and polyunsaturated fats.

Unsaturated fats (monounsaturated and polyunsaturated fats) can be used to help keep the heart healthy by lowering cholesterol levels and having other beneficial effects. Examples of monounsaturated fats or oils include olive, peanut and canola oils or margarines made from these. Examples of polyunsaturated fats or oils are sunflower, safflower and corn oil or margarines made from these. You can get a mix of monounsaturated and polyunsaturated fats or oils by choosing a reduced-fat monounsaturated spread if you use a polyunsaturated oil and vice versa.

Saturated fats (animal fats) raise blood cholesterol which contributes to heart disease. Foods high in saturated fat include butter, hard margarines, cream, full-fat dairy products, fat on meat, skin on poultry, fatty meats and sausages as well as pies, pastries, cakes, biscuits, savoury snacks and confectionery.

***Trans* fats**[4] raise harmful blood fats and reduce the beneficial blood fats. *Trans* fats can be present in foods cooked in fast-food outlets. Other foods likely to contain harmful *trans* fats include hard margarines and foods made with hard margarines such as biscuits, cakes, pies, pastries, chocolate, savoury snacks and confectionery.

IT IS IMPORTANT TO REMEMBER THAT FULL-FAT UNSATURATED SPREADS ARE JUST AS HIGH IN CALORIES AS BUTTER. UNSATURATED OILS CONTAIN EXACTLY THE SAME CALORIES AS OTHER OILS.

PLANT STEROL OR PLANT STANOL CONTAINING SPREADS FOR REDUCING CHOLESTEROL ARE ONLY SUITABLE FOR SOME PEOPLE WITH HIGH-CHOLESTEROL LEVELS. THESE SPREADS ARE NOT SUITABLE FOR CHILDREN OR PREGNANT WOMEN.

HOW MUCH? USE REDUCED-FAT SPREADS AND OIL SPARINGLY.

Although polyunsaturated and monounsaturated fat spreads and oils are better for health than saturated fat, remember that they contain exactly the same amount of calories.

It is best to choose a reduced-fat spread and to spread it lightly on breads and rolls. Reduced-fat spreads have extra water added to them during processing to bulk them up so that the amount of fat is reduced. Full-fat poly- or monounsaturated fat spreads can be used if you are active and are not overweight.

To help limit the amount of oil used, people should be advised to grill, bake, steam, stew and boil foods, whenever possible. Oil should be used sparingly in cooking.

*** Eating Out**

When eating out, try to choose lower fat options: go for grilled or baked meats and fish rather than fried; choose baked potato or pastas in tomato sauce rather than fries or creamy pasta dishes; ask for sauces and dressings to be left out or served on the side; opt for fruit or sorbets for dessert rather than cream-based desserts.

[4] *Trans* fats are also known as hydrogenated (or partially hydrogenated) fats or hydrogenated (or partially hydrogenated) vegetable oils

8. 'Other Foods'

Healthy eating can be enjoyed with limited amounts of 'other foods' like biscuits, cakes, savoury snacks and confectionary. These foods are rich in calories, fat, sugar and salt so remember - NOT too much and NOT too often.

Biscuits, cakes, savoury snacks and confectionary can be enjoyed as part of a healthy diet, but it is important to restrict their consumption. They have the disadvantage of being high in calories, fat, saturated fat and *trans* fats, but without the vitamins and minerals we need. Limit having these foods to sometimes, but not every day.

Having less of these foods is another positive step towards healthy eating. The following table shows how many calories are contained in some commonly eaten snacks, and some alcoholic drinks.

Foods	Calories Per Portion	Disadvantages
1 packet crisps (25g)	133 calories	Salty and high in fat
2 wholegrain biscuits	140 calories	High in fat and saturated fat
1 large chocolate muffin	370 calories	High in fat, saturated fat and sugar
2 scoops ice-cream	212 calories	High in fat and saturated fat
1 slice apple tart	288 calories	High in fat and saturated fat
Average chocolate bar (50g)	260 calories	High in fat, saturated fat and sugar
1 glass wine (1/8 bottle)	93 calories	Alcohol
1 pint beer	172 calories	Alcohol

Sensible Snacking for Weight Control

Choose extra fruit and vegetables - filling up on these foods will not increase your weight. **Still hungry?** Then choose extra cereal, yoghurt or milk (nutritious calories). Make biscuits, cakes and confectionery your last option. These foods are high in fat and calories but are not filling.

The Place of Sugar in Healthy Eating – Getting the Balance Right

Sugar can be taken sparingly to sweeten high fibre, nutritious foods such as stewed fruit and wholegrain cereals such as porridge. A little jam or marmalade can also sometimes replace fat spreads on wholemeal breads in order to help lower fat intakes.

However, excessive consumption of sugar, for instance, in the form of sugary drinks should be avoided. Very high intakes may lead to a higher calorie intake.

It is important to limit how often you take sweet, sticky foods and drinks throughout the day for the prevention of tooth decay. Therefore, limit soft drinks, cordials and sweetened juices. Although 'diet' soft drinks (sugar-free) can be used sometimes for variety, they are acidic and if taken too frequently, they can still harm teeth. Remember that water is the safest drink for teeth.

Alcohol is High in Calories but is not a Food

If you do drink alcohol, drink sensibly by setting limits and never bingeing.

The upper limits are:

- 21 standard* drinks per week for men
- 14 standard* drinks per week for women

These upper limits are not targets to be reached. Even at these limits, alcohol can harm your health. Limit alcohol on each drinking occasion, by including non-alcoholic drinks as far as possible.

***ONE STANDARD DRINK IS EQUAL TO A HALF PINT OF BEER, LAGER OR STOUT, ONE SMALL GLASS OF WINE OR ONE MEASURE OF SPIRITS. A FULL BOTTLE OF WINE IS EQUAL TO 7½ - 8½ STANDARD DRINKS.**

ALCOHOL SHOULD BE AVOIDED DURING PREGNANCY AND WHILST BREAST-FEEDING. IT SHOULD ALSO BE AVOIDED BY THOSE TRYING FOR A BABY.

9. Everyone should be Active to be Healthy

Balance your food with active living to help protect against disease and prevent weight gain.

Being active has enormous health benefits for everyone and it is essential to make it part of your everyday life. Active living means finding ways to be physically active every day. Examples are putting extra vigour into housework and gardening, taking the stairs where possible or going for a walk instead of watching TV.

The benefits of eating well and being active include:

- A lower risk of diseases such as diabetes, heart disease and cancer
- Stronger muscles and bones
- A healthy body weight
- Feeling and looking better

As well as these benefits, active living is also great for the mind. Being regularly active is key for good mental health as exercise is proven to reduce stress and boost your sense of well-being.

Being Active for Adults Means:

- Taking part in a minimum of 30 minutes of moderate activity on at least 5 days of the week
- To help lose weight, taking part in at least 60-75 minutes of moderate activity per day
- To help keep weight off after weight loss, taking part in about 60-90 minutes of moderate activity per day

Examples of moderate activity for adults include: brisk walking, gardening, medium-paced cycling or swimming or even housework.

THOSE WORRIED ABOUT THEIR LEVEL OF FITNESS OR THOSE WHO HAVE NOT BEEN ACTIVE FOR SOME TIME, SHOULD SEEK ADVICE FROM THEIR DOCTOR.

Being Active for Children and Young People Means:

- Taking part in a minimum of 60 minutes of moderate to vigorous activity every day

Examples of vigorous activity for children and young people includes running, swimming, cycling, skipping with a rope, basketball, football or martial arts.

Tips for Being Active in Everyday Living:

- Spend more time outdoors with the family, in the park or playground.

  Remember, active parents have active children
- Walk or cycle short distances instead of taking the car, e.g. to school, to work or to the shops
- Take the dog for regular walks
- Seek activities that you enjoy, e.g. you might prefer dancing, walking with friends or martial arts instead of going to the gym
- Get off the bus or train one stop earlier and walk the rest of the way to work or home
- Take the stairs rather than the lift or escalator

Fuelling activity

Choosing more servings from the Bread, Cereal and Potato Food Group is the ideal way to increase your intake when you are becoming more regularly active. These foods provide the best source of calories, or energy needed to fuel the body, as well as fibre, vitamins and minerals. They also help to fill you up and satisfy your appetite.

FOR CHILDREN AND ADOLESCENTS, BALANCING FOOD WITH ACTIVE LIVING FOR ADEQUATE GROWTH AND DEVELOPMENT IS THE MOST IMPORTANT PRIORITY.

10. Drink Plenty of Water

Water is essential for life. It is necessary to absorb nutrients from our food, carry nutrients around the body and to get rid of the waste products from the body. Through perspiration (sweating) the body uses water to lower our body temperature when it is warm. We need regular drinks to replace fluid lost from our bodies during the day.

- Adults need 8-10 cups of fluid every day – most of this comes from food itself (all foods contain water) as well as drinks such as tea, coffee, milk and water.
- Water is the safest drink for our teeth – 'diet' soft drinks (sugar-free) can sometimes be taken for variety, but not too often. This is because the acid they contain can still be harmful to teeth if taken too frequently.
- The more active you are, the more fluid you need to replace fluid lost as sweat.
- Water is great for quenching thirst, but it is better to drink enough before you feel thirsty, as thirst can be a sign that you are already becoming dehydrated.

11. Limit Your Salt Intake

Eating too much salt can contribute to raised blood pressure, which can in turn lead to strokes or heart disease. Cutting back on salt in the diet, along with other important measures such as eating plenty of fruit and vegetables, not drinking too much alcohol, being active, and controlling body weight can all help to keep your blood pressure in check.

Many foods which we rely on every day, such as breakfast cereals, margarines, and breads **already** contain a significant amount of salt. Of course, these foods play a very important role in healthy eating as they provide us with a lot of vital nutrients. However, there are steps you can take to lower the amount of salt you eat:

- Avoid adding salt to foods during cooking and also avoid having salt at the table
- Our sense of taste adapts well to eating less salt, and after a while, it becomes easy to enjoy food without adding it
- Flavour food with pepper, herbs and spices
- Use fruit to make tasty sauces for meat and poultry, e.g. apple or cranberry sauce, or fruit juices with fish, e.g. lemon juice
- Avoid putting salt out on the table at mealtimes (Low-sodium salt substitutes are not recommended)

IT IS ESPECIALLY IMPORTANT TO AVOID GIVING CHILDREN THE SALT HABIT. DO NOT ADD SALT TO THEIR FOODS DURING COOKING AND KEEP SALT OUT OF SIGHT AT THE TABLE.

To Help Lower Salt Intake, there are Many Foods that can be Limited

These include:

- Salty, smoked and cured meats, e.g. ham, bacon
- Stock cubes, instant gravies, packet soups and sauces
- Savoury snacks, e.g. crisps, salted nuts, pretzels
- Ready-meals and take-aways
- Foods tinned in brine
- Smoked cheeses

Check Labels for Salt Content

Adults should consume no more than 6 grams of salt or 2.4 grams of sodium per day (children under 11 years should have far less). Food labels list salt as either salt or sodium chloride. To convert salt to sodium divide by 2.5 and to convert sodium to salt, multiply by 2.5.

For example:

1 grams of salt = 0.4 grams sodium

0.8 grams of sodium = 2 grams of salt

12. Eating Well during Pregnancy and Breastfeeding

It is important to follow the advice contained in this 'food guide' to get all the nutrients needed for a healthy pregnancy. Doctors may advise some women to take extra iron in the form of a prescribed supplement. Pregnant women may need more calories in the third trimester than usual. This is best provided by including just 1-2 extra servings each day from either the Fruit and Vegetable or the Dairy or the Bread, Potatoes and Cereal Food Groups.

For example, have extra fruit and yoghurt for a snack, or having an extra slice of toast at breakfast and an extra glass of milk in the evening.

Fish is an important source of many essential nutrients, and should be eaten as part of a healthy, balanced diet. Oily fish, e.g. salmon, sardines, herring and mackerel, provide special fatty acids (long chain omega-3 fatty acids) which are important during pregnancy for eye and brain development in the baby. Women should try to include 2 servings of fish per week – oily if possible.

However, certain types of fish need to be avoided because they contain contaminants such as mercury which may be harmful to the developing baby. For this reason, pregnant women should avoid eating large predatory fish such as marlin, shark and ray. Fresh or tinned tuna may also be higher in mercury than other fish, and so pregnant women should not consume more than 1 serving of fresh tuna weekly, and not greater than two cans (2 × 240g) of tinned tuna per week.

Caffeine in the mother's diet can reach the baby and may be harmful. High caffeine intakes during pregnancy are not advisable, and mothers should aim to keep their caffeine intake below 200mg of caffeine per day. The following table shows the caffeine content of the most common caffeine containing foods and drinks, and will help to ensure the caffeine intake is within recommended limits.

Food or drink	Serving size	Caffeine content
Coffee, brewed	1 cup (200ml)	111mg (range 102-200mg)
Coffee, instant	1 cup (200ml)	78mg (range 27-173mg)
Coffee, decaffeinated	1 cup (200ml)	4mg (range 3-12mg)
Espresso	1 shot (30ml)	40mg (range 30-90mg)
Tea, brewed	1 cup (200ml)	44mg (range 40-120mg)
Cola	1 bottle (500ml)	32mg
Diet cola	1 bottle (500ml)	39mg
Stimulant energy drink	1 can (250ml)	80mg
Dark chocolate	1 bar (45g)	31mg

Information adapted from the Centre for Science in the Public Interest.

The exact amount of caffeine will vary according to cup size, brewing methods and brands of coffee or tea.

NO AMOUNT OF ALCOHOL IS SAFE DURING PREGNANCY, AND SO PREGNANT WOMEN SHOULD AVOID ALL ALCOHOLIC DRINKS.

Good food preparation and hygiene practices are important at all stages of life in order to prevent potentially harmful food borne illnesses. However, during pregnancy this is particularly important, as certain bacteria in food (such as *Listeria* and *Salmonella*), or parasites (such as *Toxoplasmosis*) can reach the developing baby and can be extremely harmful. To minimise the risk of becoming infected, pregnant women should:

- Avoid unpasteurised milk and any cheese or yoghurts made with unpasteurised milks
- Avoid cheeses which have been ripened by mould, e.g. Camembert, Danish Blue
- Avoid eating deli meats and deli salads, and pre-packed salads and coleslaws
- Avoid smoked fish such as smoked salmon, pre-cooked ready-to-eat meats, cured and smoked meats, e.g. salami
- Wash all raw ingredients such as fruits and vegetables very well before eating
- Keep raw and cooked meats separate, and use different knives, chopping boards and other kitchen utensils when preparing these foods to avoid cross-contamination
- Cook all food well throughout, and serve when still hot
- Ensure fridge temperature is below 5°C, and put food in fridge as quickly as possible
- Always wear gloves when gardening or changing cat litter, and always wash hands very well after these activities

EVERYONE IN IRELAND NEEDS TO ENCOURAGE AND SUPPORT BREASTFEEDING.

Best for Baby

Human milk is the best and most natural food for infants. It provides all the nutrients a baby needs such as protein, carbohydrate, fat, essential fatty acids, vitamins and minerals. In human milk, a mother's immunity to infections, (in the form of antibodies) is passed on to the baby offering protection against infectious illnesses. Breastfeeding may even provide protection against some conditions later on in life such as childhood obesity, diabetes and some gastrointestinal disorders.

Human milk:

- Contains cells, hormones and antibodies that fight disease and provide special growth factors
- Has anti-infective agents, which protect against diarrhoea
- Protects against asthma and lung infections
- Protects against eczema

Best for Mothers

Breastfeeding protects the health of the mother too. It helps reduce the risk of breast cancer and ovarian cancer, as well as helping the recovery after childbirth and the return to normal body weight. It also enhances the close relationship between mother and baby.

Healthy Eating for Breastfeeding Mothers

It is important during breastfeeding to have a good diet and to limit consumption of alcohol and stimulants such as caffeine (see table above). The healthy eating advice in this 'food guide' should ensure that all the nutrients needed for mother and baby are obtained. A vitamin D supplement containing 5µg per day, and a folic acid supplement containing 400µg per day should be taken. Breastfeeding mothers may also need extra calories, and so, as for pregnancy, this is best provided as an extra 1-2 Recommended Servings each day, in the form of extra bread or cereal or fruit or milk or yoghurt. Plenty of water is needed as breastfeeding can make a woman very thirsty.

ALL FAMILY MEMBERS, INCLUDING PARTNERS AND GRANDPARENTS AS WELL AS FRIENDS, NEED TO BE INVOLVED BY OFFERING PRACTICAL HELP AND ENCOURAGEMENT TO A MOTHER WHO IS BREASTFEEDING.

13. Prepare and Store Food Safely

Care needs to be taken to ensure that food does not become contaminated with harmful bacteria ('germs') and therefore, unsafe to eat. Correct handling and storage of food is important to minimise the chances of becoming sick from eating unsafe food.

How Germs Cause Illness

The germs that can contaminate food are bacteria and viruses. If they come into contact with food, these germs feed on it and multiply, especially if the temperature is right for them. Eating a contaminated food brings all these germs into the stomach from where they can cause illness.

Some germs produce toxins in the food. When the food is eaten, the toxin causes the problems that follow, rather than the germs themselves. The effects of eating spoiled food vary widely. It may only lead to minor effects in healthy adults, such as an upset stomach. However, symptoms can be more severe and include stomach pains, vomiting and diarrhoea. These can be particularly harmful to pregnant women, the young, the sick and the elderly.

How Does Food Become Unsafe?

Bacteria are present everywhere and so foods should be stored, prepared and cooked safely. There are a number of ways that food can become contaminated.

For example:

- Touching food with unclean hands
- Using dirty kitchen utensils
- Allowing raw foods, such as meat, fish and poultry, to come into contact with cooked foods. This can occur if raw and cooked foods are prepared on the same chopping board or with the same knife. Raw meats stored in the refrigerator can also drip onto cooked foods

The Importance of Temperature

Bacteria thrive in warm temperatures - not too hot, not too cold. Problems can come about when cooked food is kept lukewarm for long periods. Although the bacteria may have been killed when a food was first cooked, it is possible for food to become contaminated again and for the bacteria to grow. At low temperatures, bacteria are still alive but do not multiply in numbers and spoil food. This explains why food keeps longer in the fridge than at room temperature. At high temperatures, bacteria die. If fresh food is well cooked and eaten straight away, it is generally safe to eat.

Tips for Keeping Food Safe

- Always wash hands before preparing or serving food and after handling animals or using the toilet
- Wash everything well after use
- Store raw foods down low in the fridge and check fridge temperatures regularly
- Foods and left-overs that belong in the refrigerator should always be returned there as soon as possible
- Thaw frozen meats in the refrigerator
- Take special care with the storage and handling of seafood and raw meat
- Left-over canned foods should be put into covered containers, stored in the fridge and eaten within a few days
- With packaged food, always pay attention to the 'use-by' or 'best-before' date
- Do not eat if the date has passed

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ANNEX 2. RESEARCH TEAM AND ADDITIONAL PUBLICATIONS

The FSAI gratefully acknowledges the input of the following people who worked with the Public Health Nutritionists in the FSAI (Dr Mary Flynn and Dr Sarah Burke) to complete the research that underpins this report and who contributed to the report write-up:

Ms Niamh Devaney, Ms Gemma Faulkner, Ms Cliona Flynn, Ms Magda Gajownik, Dr Edel Keaveney, Ms Marianna Mc Feeley, Dr Claire O'Brien, Dr Annalouise O'Connor and Ms Victoria Ross.

Flynn MAT, O'Brien CM, Faulkner GP, Flynn CA, Gajownik M and Burke SJ (2010) Revision of food-based dietary guidelines for Ireland, Phase 1: Evaluation of Ireland's food guide. *Public Health Nutrition*: SUBMITTED.

Flynn MAT, O'Brien CM, Ross VM, Flynn CA and Burke SJ (2010) Revision of food-based dietary guidelines for Ireland, Phase 2: Recommendations for healthy eating and affordability. *Public Health Nutrition*: SUBMITTED.

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McFeely M, O'Brien CM, Burke SJ and Flynn MAT (2010) Evaluation of current food-based dietary guidelines for healthy eating in Ireland. Proceedings of the Nutrition Society. In Press

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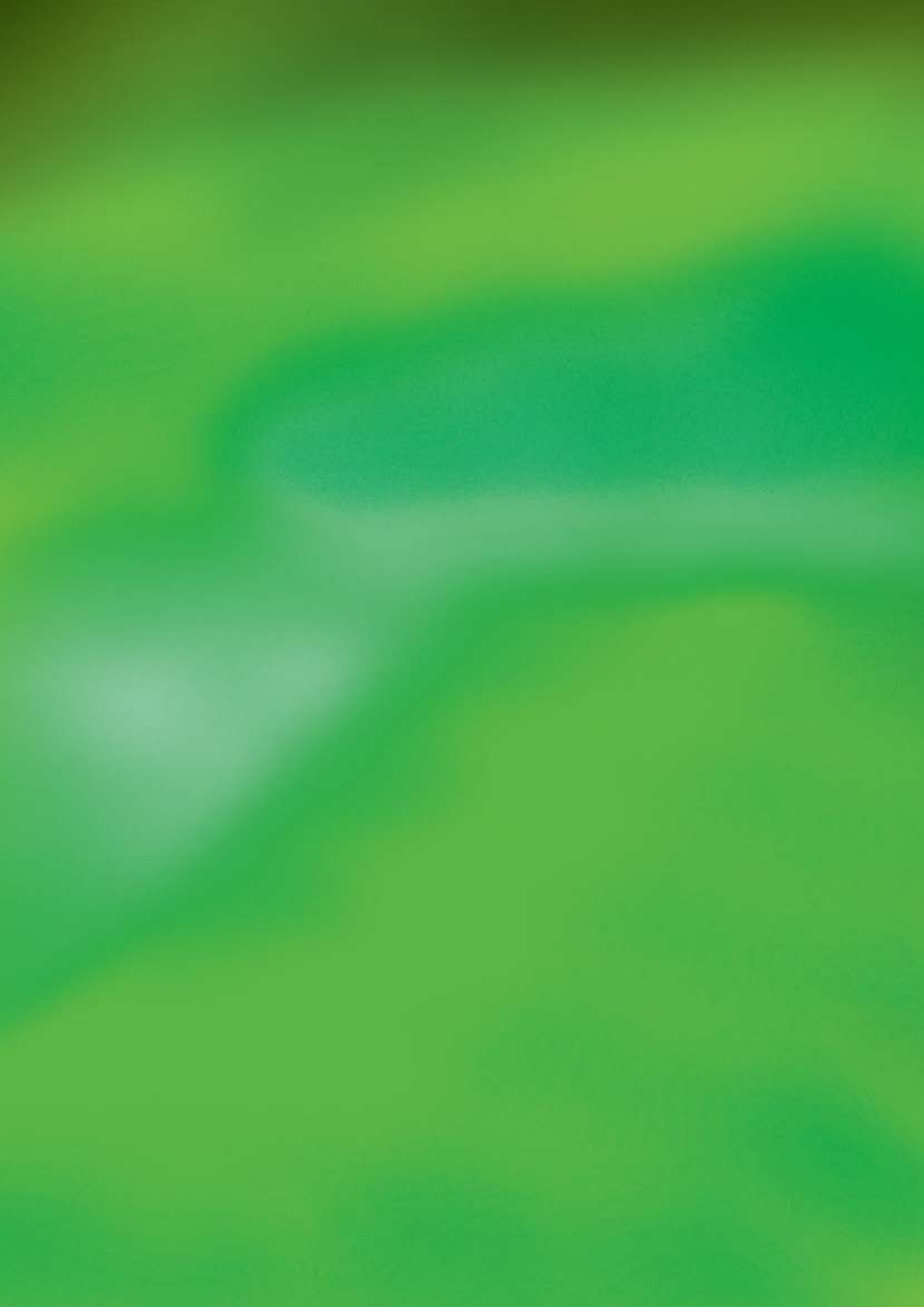
NOTES



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