

Nutrition Advisory Group

Recommendations for a

Food and Nutrition Policy

For Ireland

1995

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Foreword

We are fortunate in Ireland in 1995, as we commemorate the 150th anniversary of the Great Famine, to enjoy a standard of living which should make it possible for all our people to have access to sufficient food. A diet which includes a wide variety of food can promote health and wellbeing, as well as providing pleasure and enjoyment.

Ireland has a high death rate from diseases which are associated with modern western lifestyles. Diet is one factor leading to these diseases, but smoking, alcohol, activity and other aspects of lifestyle are also important. There have been improvements in recent years, with declines in tobacco consumption and some changes in eating patterns. There has been a decline in death rates from lung cancer in young men and reductions in deaths from heart disease and stroke in men and women in the younger age groups. Nevertheless, life expectancy in middle age in Irish men and women continues to compare unfavourably with that in other developed countries.

Economic wellbeing is probably the most important determinant of the health of any population. The agriculture and food sectors are a major contributor to the Irish economy providing income, directly and indirectly, to many of our people. We can take pride in producing fresh, wholesome food in a clean and unpolluted environment. However, our agriculture and food sectors are heavily dependent on the continuing markets for our meat and dairy produce. A substantial proportion of our other food requirements are imported, particularly cereals, vegetables and fruit.

It is the role of government to ensure access to a range of foodstuffs by the population and particularly by vulnerable groups. Given the high prevalence of nutrition-related diseases in Ireland and the increasing consumer awareness of health issues, it is vital that the Irish food industry be encouraged and supported to produce a greater range of foods, to meet the nutrition requirements of our people. This is quite compatible with the continued expansion and development of the sector, given that nutrition and health issues are receiving increasing attention in many of the countries with which we do business.

The Nutrition Advisory Group is not advocating radical changes in the national diet. Rather it is proposed that there should be a continuation of current trends, with a gradual reduction in the quantity of fat and a modest alteration in the balance of fats consumed, and increased consumption of carbohydrate foods, vegetables, fruit and fish.

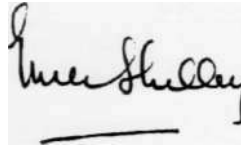
Many of the discussions of the Group concluded by recommending that further research should be undertaken. Priority should be given to acquiring basic information on current nutrient intakes by the population and by different age, sex and social groups. Research is also required into the potential for prevention of those nutrition-related diseases which have a high incidence in Ireland.

The other major issue which received a great deal of attention, both within the Group and in the submissions we received, was the extent to which there is public confusion about what constitutes a healthy diet. It is important that clear, accurate and consistent information be readily accessible to the public.

Through their involvement in the preparation of this food and nutrition policy, the members of the Nutrition Advisory Group have demonstrated their commitment to nutrition and health in Ireland. I am most grateful to them for their involvement, including their willingness to prepare background papers

and to consult with others.

Food and nutrition policy is relevant to the everyday life of all our citizens. I hope that it will be possible to engage in a formal process of discussion, consultation and feedback, so that the policy which is implemented will have the support of all the major players in the process. Above all, I hope that the government will continue, by its actions, to demonstrate its commitment to the improvement of nutrition status and health of all our people.

A handwritten signature in black ink, reading "Emer Shelley", with a horizontal line underneath.

Dr. Emer Shelley
Chairperson, Nutrition Advisory Group

Acknowledgements

The members of the Nutrition Advisory Group showed their commitment to improving the health of the population of Ireland through optimum nutrition by their dedicated and enthusiastic participation in the development of this report on food and nutrition policy.

Research for the Food and Nutrition Policy for Ireland was carried out by Ms. Sheena Rafferty who was Research Nutritionist to the Nutrition Advisory Group from March 1993 to April 1995. Ms. Rafferty was based at The Department of Preventive Medicine, Education and Research Centre, St. Vincent's Hospital, Elm Park, Dublin. We gratefully acknowledge the support provided by the staff of that Department.

We were ably assisted in our work by the Secretariat in the Public Health Division and in the Food Unit of the Department of Health. Support was also provided by Ms. Linda O'Connell and Ms. Claire Collins in the Department of Epidemiology in the Royal College of Surgeons in Ireland.

Those who sent us submissions on their views on food and nutrition policy are listed in Appendix 1. All submissions were reviewed and were an important source of opinion and information for the Group.

We consulted with experts on a number of issues and are grateful for their ready responses to our requests for information and advice. These included Mr. Brendan Dineen, Dr. Albert Flynn, Dr. Mary Flynn, Ms. Sharon Foley, Ms Valerie Freeman, Ms. Sharon Friel, Dr. Fergus Hill, Dr. Mary Kearney, Prof. Moira O'Brien, Prof. Denis O'Mullane, Prof. John Scott, Dr. Sean Strain, Dr. Declan Sugrue and the Paediatric Interest Group of the Irish Nutrition and Dietetic Institute.

Membership of the Nutrition Advisory Group

Dr. Emer Shelley, (Chairperson), Department of Epidemiology and Preventive Medicine, Royal College of Surgeons in Ireland.

Mr. Hugh Boyle, Food Unit, Department of Health (since March 1995).

Ms. Jean Cahill, Consumers' Association of Ireland (since April 1993).

Ms. Breda Cleary, Institute of Community Health Nurses, Eastern Health Board (since July 1993).

Mr. Gerard Downey, Teagasc, Agriculture and Food Development Authority (since September 1994).

Ms. Brid Farrell, Food Division, Department of Agriculture, Food and Forestry (since February 1994).

Mr. Gerard Gavin, Assistant Chief Dental Officer, Department of Health (since September 1994).

Prof. Michael J. Gibney Department of Clinical Medicine, Trinity College, Dublin.

Dr. Ronan Gormley, Teagasc, Agriculture and Food Development Authority (from February 1994 until September 1994).

Prof. Cecily Kelleher, Department of Health Promotion and National Nutrition Surveillance Centre, University College, Galway.

Dr. Aiden Meade, General Practitioner, Dublin.

Mr. Denis Mehigan, Food Division, Department of Agriculture, Food and Forestry (since February 1994).

Prof. Patrick Morrissey, Department of Nutrition, University College, Cork (until September 1994).

Ms. Lulu McGann, Food Unit, Department of Health (since January 1995).

Ms. Ursula O'Dwyer, Consultant Dietitian, Health Promotion Unit, Department of Health.

Mr. Tom Power, Public Health Division, Department of Health (until March 1995).

Ms. Vivien Reid, Department of Preventive Medicine/Cardiology, St. Vincent's Hospital, Dublin.

Ms. Alice Shortt, Nutrition Advisor to the Elderly, Eastern Health Board (until October 1992).

Ms. Helen Shortt, Irish Nutrition and Dietetic Institute (until September 1993).

Ms. Sheila Sugrue, Irish Nutrition and Dietetic Institute (since November 1993).

Secretariat, Department of Health

Ms. Emer Brady (until September 1991).

Mr. Michael Mulkerrin (from September 1991 until February 1992).

Mr. Billy McCarthy (from March 1992 until January 1995).

Ms. Brenda Lannon (since January 1995).

Research

Ms. Sheena Rafferty, Research Nutritionist, based at the Department of Preventive Medicine/Cardiology, Education and Research Centre, St. Vincent's Hospital, Dublin (from March 1993 until April 1995).

Executive Summary

1. A food and nutrition policy has been defined as "a national strategy for improving the nutritional status of the population compatible with the social, economic and cultural priorities". It includes strategies to influence food production and processing, distribution, retailing and catering, so as to encourage the consumption of nutritious food by the population.
2. Although diet alone does not cause diseases such as dental caries, cardiovascular disease, diabetes mellitus, various cancers, bowel disease, obesity and osteoporosis, it is a contributory factor along with environmental and genetic influences.
3. The Irish National Nutrition Survey provides the most comprehensive information about nutrient and food intake in Ireland in recent times. Iron, calcium and folate intakes were below the recommended dietary allowances (RDAs) in some age groups of women. Dietary fibre intakes were below the RDA in men and women. Fruit, vegetable and fish consumption is low in Ireland compared to other European countries.
4. The main dietary guidelines for the population in general are:
 - Eat a wide variety of foods;
 - Balance energy intake with physical activity levels;
 - Eat plenty of fruit and vegetables. Aim to eat at least four servings every day;
 - Starchy foods such as bread and cereals should be eaten daily;
 - Frequent consumption throughout the day of foods containing sugar should be avoided, especially by children;
 - Total fat intake should be reduced, with emphasis on reducing saturated fats.

Additional dietary recommendations are made for babies, children and adults at different stages of the life cycle.

5. Factors which influence food choice and quality include the climatic, economic and trading environment in which food is produced. Food safety, hygiene, labelling and fortification are regulated by national and EU legislation. The disposable income of the consumer is obviously important, as are knowledge and attitudes about food and nutrition.
6. The following are the key recommendations of the Nutrition Advisory Group for health gain through improved nutrition:
 - (1) Food and nutrition policy development and implementation will require long-term, sustained commitment by government;
 - (2) Organisational structures relevant to food and nutrition policy should include a mechanism for consultation with food producers and consumers;
 - (3) The activities of state and semi-state agencies should be compatible with the national food and nutrition policy;

- (4) National food consumption surveys of sufficient detail to meet the needs of both nutrition assessment and the monitoring of food safety should be carried out every five years;
- (5) A proactive approach should be taken to the dissemination of nutrition information to the public;
- (6) A community nutrition and dietetic service should be provided throughout the country;
- (7) Monitoring of changes in food consumption and in nutrition-related diseases is essential to the evaluation and on-going development of food and nutrition policy in Ireland.

Chapter Summaries

Chapter 1 sets out the terms of reference of the Nutrition Advisory Group, one of which was "To assist in the formulation of a food and nutrition policy to improve nutrition and health in Ireland".

The main aims of this report are:

To summarise what is known about nutrition and health in Ireland;
To update dietary guidelines for the population;
To make recommendations for the further development and implementation of food and nutrition policy.

The methods used in the preparation of this report are described.

Chapter 2: A national food and nutrition policy is an integrated strategic approach to improving the nutrition status of the population. Planning takes the social, economic and cultural context into account as well as baseline health and nutrition status. It is an important component of public policy for health and aims to encourage the consumption of nutritious food by the population. Strategies may involve all stages of the food chain, from the producer to the consumer.

Changes which have occurred in the diet of many Western countries during this century include a decrease in total energy intake, an increase in the percentage energy consumed as fat and a decrease in the intake of complex carbohydrates found in foods such as wholegrain cereals, bread and potatoes.

Diet alone does not cause diseases such as dental caries, cardiovascular disease, diabetes mellitus, various cancers, obesity, osteoporosis and bowel disease. It is, however, an important contributory factor along with environmental and genetic influences.

Formulation and implementation of food and nutrition policy starts with an assessment of the nutrition and health status of the population. Strategic plans are then developed to improve the nutrition status of the population. Structures are put in place to monitor and evaluate progress, thereby contributing to on-going policy development. These stages are illustrated by the experiences of a number of European countries in the implementation of food and nutrition policy.

Developments in Ireland in recent decades relevant to food and nutrition policy are summarised, including the establishment of the National Nutrition Surveillance Centre and the Food Safety Advisory Board.

Chapter 3 contains a brief review of the sources of energy (macronutrients) in the diet - carbohydrate, fat, protein and alcohol. The main micronutrients are also described; these include vitamins, both water and fat soluble, and minerals.

Chapter 4 summarises the findings of the Irish National Nutrition Survey which was undertaken in the late 1980s. Food intake was measured in a random sample of the population. The main sources of energy were bread, meat and meat products, potatoes, milk, and biscuits and cakes. Bread, potatoes and biscuits and cakes were the main sources of carbohydrates; meat and meat products, milk products and spreadable fats were the principal sources of fat; meat and meat products, milk and bread were the major sources of protein in the diet. Iron, calcium and folate intakes were below the recommended dietary allowances (RDAs) in some groups of women. Dietary fibre intakes were below the RDA in men and women.

Comparison of the national nutrition survey carried out in the late 1980s with that done forty years earlier showed that the diet in the 1940s was higher in energy and higher in complex carbohydrates and dairy products. There was a reduction in the intake of iron and of calcium between the two national surveys.

Comparisons are also provided with the findings of nutrition surveys in other European countries. Irish nutrient intakes are similar to those in the United Kingdom and Northern Ireland. The energy and nutrient intakes of most other countries are slightly higher than those in Ireland, except for calcium. Ireland has higher liquid milk consumption than many other European countries but has a low consumption of cheese and yoghurt. Fruit, vegetable and fish consumption is low in Ireland compared to other European countries.

In addition to diet, health is influenced by other lifestyle factors, including physical activity and smoking. Some information is provided on trends in nutrition-related diseases in Ireland.

Chapter 5 : Two sets of qualitative (as opposed to quantitative or numerically-stated) dietary guidelines are presented. The first set applies to the population in general :

- | | |
|---------------|---|
| Guideline 5.1 | Eat a wide variety of foods. |
| Guideline 5.2 | Balance energy intake with physical activity levels. |
| Guideline 5.3 | Eat plenty of fruit and vegetables. Aim to eat at least four servings every day. |
| Guideline 5.4 | Starchy foods such as bread (preferable wholemeal), cereals, pasta and rice, as well as fruit and vegetables, should be eaten daily. Frequent consumption throughout the day of foods containing sugar should be avoided, especially by children. |

Guideline 5.5 Total fat intake should be reduced, with emphasis on reducing saturated fats. Some of the saturated fat may be replaced by unsaturated fats. Oily fish is a good source of unsaturated fats as well as some essential fatty acids. Current evidence suggests that there should be no increase in the intake of trans fatty acids.

No guideline is proposed for alcohol consumption in view of the impending publication of a national alcohol policy.

The second set of dietary guidelines relates to groups with special dietary needs in view of their stage in the life cycle. These apply to babies, infants and toddlers, schoolchildren, adolescents and young women and men, women before and during pregnancy, mature women and men, and older people.

Chapter 6 provides information about a variety of factors which influence the food choices which are made by consumers. Food production and processing are influenced by climate and by the national and international trading environment. Thus, developments within the European Union and in the GATT (now the World Trade Organisation) negotiations have major implications for the Irish agri-food sector.

There is substantial national and EU legislation relating to food safety and hygiene. There are a number of supporting inspectorates, allied to education and training schemes. Food fortification and food labelling are also dealt with by legislation.

Retailers can act as a credible source of nutrition information for consumers. The price of food, particularly relative to income, is an important determinant of the consumer's ability to purchase sufficient and varied food for the household. Outside the home, caterers play an important role in providing access to healthy food choices. All those who participate in the food chain are influenced by the social and cultural context in which they live and work.

A variety of government and semi-state agencies have an impact on food production and have an important role in the implementation of food and nutrition policy.

Chapter 7 sets out the recommendations of the Nutrition Advisory Group for the further development and implementation of food and nutrition policy in Ireland. Key recommendations are as follows (numbered as in the text of the chapter):

Policy development and implementation will require the long-term, on-going and sustained commitment of government. All government departments should be required to take health considerations into account when deciding on policies which influence food production and consumption. (7.1.2)

One organisation should be responsible for the implementation and co-ordination of food and nutrition policy measures. (7.2.1)

Mechanisms for consultation should be established where account can be taken of the views of consumers, scientists, the agri-food industry and regulatory authorities. (7.2.3)

National food consumption surveys of sufficient detail to meet the needs of both nutrition and the monitoring of food safety should be carried out every five years. (7.3.1)

Methods to promote healthy eating among at risk groups should be further investigated. (7.3.5)

A database should be established on national, European Union and international regulations about food standards. (7.4.3)

Food producers, processors, retailers and restaurateurs should be encouraged and supported to increase the range of healthy food choices available to consumers. (7.5.1, 7.5.2, 7.5.3, 7.5.5)

A proactive approach should be taken to the dissemination of nutrition information to the public. (7.6.1)

All educational establishments should formulate and implement a nutrition policy and review it regularly. (7.7.1)

Community nutrition and dietetic services should be provided throughout the country; in addition, clinical nutrition services should be developed, in association with general practitioners, in hospitals, nursing homes, ante-natal clinics and day centres for the elderly. (7.8.5, 7.8.6, 7.8.7, 7.8.8)

Monitoring of changes in food consumption and in nutrition-related diseases is essential to the evaluation and on-going development of food and nutrition policy in Ireland. (7.9.1)

Chapter

Introduction

one

i.i Terms of Reference

The Nutrition Advisory Group was established by the Minister for Health in June 1991, with the following terms of reference:

- To assist in the formulation of a national food and nutrition policy to improve nutrition and health in Ireland;
- To review and update dietary guidelines in the light of new scientific and surveillance information;
- To advise the Minister for Health and the Department of Health on specific nutrition issues such as very low calorie diets or nutritional labelling;
- To advise and represent the Department of Health on media issues relating to nutrition as appropriate;
- To identify specific sub-groups in the population with particular nutritional needs;
- To combat misinformation on nutrition.

This report relates mainly to the first term of reference, the formulation of a food and nutrition policy for Ireland. Revised dietary guidelines are included (*Chapter 5*). Recommendations are also made on the provision of appropriate information to the public about nutrition-related matters (*Chapter 7*).

1.2 Aims of a Food and Nutrition Policy for Ireland

The overall aim of any national food and nutrition policy is to facilitate the development and maintenance of good health through appropriate food consumption. At one extreme the aim is to ensure adequate food and nutrient intake to prevent malnutrition and, at the other extreme, to avoid excessive intake leading to increased risk of developing several chronic diseases.

This document aims to:

- Outline the food and nutrient intake which would maintain and promote health and prevent disease;
- Update dietary guidelines for the population in the context of what is known about nutrition and health in Ireland;
- Consider the barriers to the attainment of optimum nutrition by consumers;
- Consider the implications of dietary recommendations for the national food supply and particularly for the Irish food industry;
- Make recommendations for the further development and implementation of food and nutrition policy in Ireland.

In compiling this report, the Nutrition Advisory Group considered that the concept of a food and nutrition policy should be elaborated (*Chapter 2*), the elements of a healthy diet should be discussed (*Chapter 3*) and the particular nutrition and health circumstances pertaining to Ireland should be described (*Chapter 4*). The Group considered that a revised statement on dietary

guidelines was necessary (*Chapter 5*) and was also aware of the many non-nutritional issues that influence food consumption (*Chapter 6*). Finally, (*Chapter 7*), the Nutrition Advisory Group in its recommendations seeks to chart the way forward for the formulation and implementation of an appropriate food and nutrition policy for Ireland.

1.3 The Development of A Food and Nutrition Policy for Ireland

The Nutrition Advisory Group used the following methods to prepare its report:

- (a) Reports on research, nutrition, health and disease were reviewed, including relevant Irish reports. Among these were three reports of the Food Advisory Committee, one issued in 1979 and two in 1984, the Irish National Nutrition Survey (Irish Nutrition and Dietetic Institute 1990), the Kilkenny Health Project (1992) and the National Nutrition Surveillance Centre (1993 and 1994). The Health Promotion Unit of the Department of Health is implementing the "Nutrition Health Promotion Framework for Action" which was published in 1991. The health strategy document "Shaping a Healthier Future" published by the Department of Health in April 1994 provided important information on plans for health policy in general. Since then the Department of Health has published a document setting out priorities for health promotion and a discussion document on women's health (Department of Health 1995a, 1995b).
- (b) The Secretariat of the Nutrition Advisory Group advertised inviting submissions in July 1992 and wrote to 40 organisations for comments on the formulation of a food and nutrition policy. A total of 34 submissions were received (Appendix 1).
- (c) Guidance was obtained from government departments on various aspects of the policy .
- (d) Nutrition and medical researchers were consulted on the advice that should be given to the general population and on nutrition issues specific to sub-groups of the population.

Chapter

The Development of a Food and Nutrition Policy

Two

2.1 Health Promotion

Health promotion has been defined as the process of enabling individuals and communities to increase control over the determinants of health and thereby improve their health (World Health Organisation 1986a). Health promotion involves action at five different levels including building healthy public policy, the creation of supportive environments, strengthening community involvement, the development of personal skills and reorientation of health services. A national food and nutrition policy is an important component of building a public policy on health (Milio 1991). This has been accepted by Ireland as a signatory to the declaration of the International Conference on Nutrition of 1992 which was jointly organised by the World Health Organisation and the Food and Agriculture Organisation.

The strategy of the European Region of the World Health Organisation to achieve Health For All by the year 2000 focuses on the health problems of industrialised societies (World Health Organisation 1986b). The main areas of activity are the promotion of lifestyles conducive to health, the reduction of preventable conditions and the provision of care that is adequate, accessible and acceptable to all.

There has been an increased emphasis on disease prevention and health promotion since Health for All 2000 was initiated. This is reflected in the Irish health strategy document "Shaping a Healthier Future" (Department of Health 1994a).

2.2 Definition of a Food and Nutrition Policy

A food and nutrition policy should facilitate access to healthy food by all of the population irrespective of their geographic, social, cultural or economic circumstances. Various definitions are available. The Nutrition Advisory Group agreed to adopt the definition of the Food Advisory Committee (1979) :

"...a national strategy for improving the nutritional status of the population in a manner compatible with social, economic and cultural priorities".

The components of a policy have been described in more detail as follows:

"A national policy should involve a formalised, coherent set of statements by government, setting a framework for the control of food production, processing, distribution, retailing and trade, so as to encourage the consumption of nutritious food by the population" (Downey 1987).

2.3 Issues Relevant to a Food and Nutrition Policy

The concept of a food and nutrition policy has changed in the past century (Helsing 1990). The main issues which influenced policy development are summarised below:

- (a) Initially policies were based on providing a sufficient supply of food for the population. There was an underlying need to distribute food in an economic way to prevent deficiencies arising. There was a tendency to assume that if the food supply was adequate there would be no need for a food policy (Helsing 1990). This concept gradually changed in the 1970s and 1980s when several countries developed nutrition policies (see, for examples, section 2.5).

- (b) The emergence of modern lifestyles has been associated with access by the majority of the population to a wide range of food. Changes in dietary patterns are characterised by (Downey 1987):
- A decrease in total energy consumption;
 - An increase in the percentage energy consumed as fat;
 - A decrease in the intake of complex carbohydrates and an increase in the intake of simple carbohydrates;
 - An increase in the intake of protein from animal sources.
- (c) In most Western countries the disease pattern has shifted from diseases caused by deficiency to those caused by excess. Although diet alone cannot be blamed for the prevalence of diseases such as dental caries, cardiovascular disease, hypertension, diabetes mellitus, various cancers, obesity, osteoporosis, anaemia, goitre and bowel disease, it can be seen as a contributory factor along with other environmental and genetic influences.
- (d) There have been major developments in food production and processing in Ireland in recent decades, as well as substantial changes in distribution and in the retail sector. The Irish food industry operates within the directives and regulations which apply within the European Union and is influenced by international trade agreements and by changes in economic circumstances in other countries.

Given the changes in diet and the developments which have occurred in the food sector it is timely to review recommendations for nutrient intake and to formulate a food and nutrition policy for Ireland.

2.4 Policy Development and Implementation

As the development of a food and nutrition policy usually falls to a committee, the process must be consultative (Gibney 1991). Intersectoral discussion with government departments and representative bodies of all involved parties is essential.

The experience of different countries in the development of policies on food and nutrition shows the need for a three stage process (Helsing 1990):

- Problem definition and formulation of goals;
- Strategic planning based on these goals;
- Monitoring, evaluation and feedback.

The detailed components of a food and nutrition policy as delineated by Helsing (1990) are set out in Figure 2.1.

Figure 2.1 Components of a National Food and Nutrition Policy
(derived from Helsing 1990)

Prerequisites	Nutrition policy objectives - Goals for food and health Nutrition information system - Data on food and health
Food Quality	Food quality standards, fortification Food safety
Food Availability	Agricultural policy Food processing Prices, taxes and subsidies Mass catering Food trade
Knowledge	Professional training in nutrition Nutrition information to the public Nutrition labelling
Organisation	Co-ordinating body Advisory body Decision makers

An acknowledgement of the role of food and nutrition in promoting health and preventing disease is basic to the formulation of food and nutrition policy. Consideration is given to food safety and standards, and to the food and nutrient components of the diet which would best attain the desired health outcomes in the population and in groups with special needs.

It is not, however, sufficient to set goals in terms of food, nutrients and health. It is also necessary to review the agricultural, trade, economic, social and environmental context in which the policy is being developed. In addition, the barriers to making healthy food choices should be considered. Thus, the information-gathering process for policy formulation should be comprehensive and broadly based.

Strategies for the attainment of food and nutrition goals include the assurance of food quality and safety, increasing access to healthy food choices, and improving knowledge, both of health professionals and of the public.

Food and nutrition policy formulation should be a dynamic and evolving process, moving gradually to the attainment of nutrition and health goals, through multisectoral co-operation. Monitoring of progress is an integral component of this process, estimating the rate at which goals are being achieved, acknowledging those strategies which are successful and highlighting areas in which additional efforts will be required.

The World Health Organisation has emphasised the need for a national organisational structure for the implementation of food and nutrition policy (WHO 1990). This is essential to ensure that decisions and trends in all relevant sectors are compatible with the food and nutrition policy.

The Nutrition Advisory Group accepts and has sought to follow the approach to policy formulation outlined above but also recognises that the goals, strategies and structures will be unique to each country. Ireland can learn from and will be influenced by the experiences of other countries. In addition, the extent to which health and nutrition are integral elements of food policy in our major export markets will have implications for the strategic development of our national agri-food industry.

Food and Nutrition Policies in Europe

It is instructive to consider the approach adopted elsewhere. Norway, The Netherlands and Malta are examples of European countries which have developed and implemented a food and nutrition policy. The United Kingdom is implementing a nutrition health promotion programme as one component of a strategic plan to improve health.

2.5.1 Norway

The Norwegian food and nutrition policy document was published in 1976, with the Departments of Agriculture and Health having central roles in its formulation (Royal Norwegian Ministry of Agriculture 1975-76). The main objectives of the food and nutrition policy were:

- To reduce the prevalence of nutrition-related illness in the population;
- To ensure the safety of food products;
- To contribute to strengthening the influence of consumers on food and nutrition policy;
- To contribute to the safe production, distribution and marketing of food products and to safe consumption patterns in terms of health, the environment and appropriate use of resources.

Strategies such as the integration of policy, the establishment of an inter-ministerial co-ordinating committee for nutritional issues, the dissemination of information, and legislation and control were all reviewed in order to update the Norwegian food and nutrition policy (Royal Norwegian Ministry of Health and Social Affairs 1981-82). The need for surveillance and monitoring to facilitate policy updating has been emphasised (National Nutrition Council 1991).

Pricing policies have been used to support the nutrition policy. For example, producers are paid on the basis of milk protein content, as opposed to fat content. Differential price subsidies have been used to promote the consumption of skimmed milk.

The structures used to implement the policy included The National Nutrition Council (established in 1946) and the Norwegian Food Control Authority (established in 1988).

Nutrient intakes in Norway have changed since the initiation of the first national food and nutrition policy; protein intake has stabilised, fat intake which had been greater than 40% of food energy has declined to 34%, and carbohydrate and sugar intakes have increased.

The policies which are being pursued at present are aimed at (Royal Norwegian Ministry of Health and Social Affairs 1993):

- Increasing consumption of fish, wholemeal flour, potatoes, cereals, fruit and vegetables;
- Decreasing fat and whole milk consumption, increasing consumption of low fat dairy products and lean meat, and stabilising the intake of meat, cheese and cream;
- Decreasing the intake of sugar, salt and alcohol.

The Norwegian experience in the development, implementation, evaluation and reappraisal of food and nutrition policy illustrates how government departments, particularly agriculture and health, can co-ordinate their activities towards the long term attainment of improved nutrition and health in the population.

2.5.2 The Netherlands

The Dutch Food and Nutrition Policy was adopted by parliament in 1984 (Ministry of Welfare, Health and Cultural Affairs 1992). The policy aimed, as part of a broader framework of measures for health protection and disease prevention, to provide for an adequate supply of safe foodstuffs and to promote healthy eating habits. The document highlights the need for co-ordination between the development of food policy and the development of other policies including those relating to the environment, consumers, education, media, international trade and research. It also emphasises the need for closer co-operation between ministries and advisory boards. Issues relating to food composition, food safety and eating habits are considered.

A progress report on the Dutch policy describes the merger of the Netherlands Institute for Nutrition and the Institute for Scientific Guidance on Nutrition to form the Dutch Nutrition Foundation (Ministry of Welfare, Health and Cultural Affairs 1993). Guidelines for a healthy diet were published in April 1986 by the Dutch Nutrition Council. The Netherlands Food and Nutrition Council published Recommended Dietary Allowances in 1989. The Steering Committee for Healthy Nutrition (Project Group) have developed various programmes to support policy implementation, including community-based catering and media programmes. There have been changes in food consumption in recent years, supported by the provision of an increased range of healthy food choices by the agri-food sector (Traill, in press).

2.5.3 Malta

The development of a national policy for Malta was supported by three national nutrition conferences (National Advisory Committee on Food and Nutrition 1990; Bellizzi, Muscat, Galea 1993). The national food and nutrition policy has two aims - to assist the Maltese population towards adopting a healthy dietary pattern and to take into consideration the provision and production of food. The objectives of the policy are:

- To establish nutrient goals and 'Recommended Daily Intakes' as the basis for the Maltese Food and Nutrition Policy;
- To determine and update, by an advisory board on nutrition, the food goals and forecasts for the year 2000;

- To review measures for dealing with food availability, quality and safety;
- To disseminate information on dietary guidelines;
- To establish specific sectoral and intersectoral objectives and strategies, and to formulate and implement intersectoral plans with short term and long term goals.

The intersectoral National Advisory Committee on Food and Nutrition is responsible for implementing the policy.

2.5.4 The United Kingdom

The United Kingdom has launched a strategic plan - "The Health of the Nation" - to improve the health status of the population (Department of Health, UK, 1992). The plan aims to achieve reduced mortality rates from coronary heart disease, stroke and cancers by the year 2000. The dietary targets include a reduction in total fat and saturated fatty acid intake to 35% and 11% of total energy respectively. Targets for the year 2005 are to reduce the proportion of men and women aged between 16 and 64 years who are obese by at least 25% and 33% respectively and to reduce alcohol consumption in the population.

The Nutrition Task Force was established in 1992 to devise programmes of action to attain the Health of the Nation targets. The Task Force's report "Eat Well" makes detailed recommendations based on the deliberations of its four Working Groups: education and information; catering; the food chain; and the National Health Service and health professionals (Department of Health, UK, 1994). The programmes of action in each of these areas include recommendations on how progress should be monitored, and by whom, when the Task Force is disbanded at the end of 1995.

While the Task Force dealt specifically with England, it is intended that there will be parallel developments in food and nutrition policy in the other countries of the United Kingdom. The implementation of nutrition action programmes in the U.K. presents important challenges and opportunities to the agriculture and food processing industries in Ireland.

2.6 Developments in Ireland relevant to Food and Nutrition Policy

- (a) A report titled "Considerations for a Food and Nutrition Policy in Ireland" outlined the need for a coherent policy on food and nutrition to improve the health and well-being of the population (Food Advisory Committee 1979). The links between nutrition, health and disease within the population as a whole and in at-risk groups (infants, adolescents, the elderly etc.) were briefly described. The following recommendations were made :
 - A national system for the continuous assessment of food and nutrition should be developed on the basis of surveillance indicators and periodic microsurveys;
 - A comprehensive plan should be developed for the adequate staffing of institutional and community health services by dietetic and catering personnel, together with appropriate guidelines and standards for delivery of nutrition services;

- A co-ordinated programme of nutrition education should be developed by the Departments of Health and Education for application throughout the formal education system with campaigns for at-risk groups and dissemination of information to the general public;
- Standards and guidelines should be developed at national level for the training and education of professionals in nutrition and in related areas such as medicine, nursing and dentistry;
- Technical norms and standards should be elaborated for a wide range of nutritional parameters including physical status, dietary intake and food composition. These should be widely disseminated through government services and form the basis for education activities and for surveillance. Priorities for research in human nutrition should be determined taking into account service needs relating to vulnerable population sub-groups.

The report stated that the Department of Health would require the active involvement of a wide range of state agencies in developing a comprehensive food and nutrition policy. The report went on to recommend the establishment of an intersectoral or co-ordinating unit to develop, implement and evaluate a food and nutrition policy for Ireland.

- (b) A consultative document on health policy published in 1986, "Health The Wider Dimensions", reviewed health service structures. It recognised the importance of health promotion and the resulting requirement to reshape the health services to bring about a more appropriate balance between prevention, cure and care. The report concluded that integrated policies for health promotion were required at national and local level.
- (c) The Health Education Bureau produced a report in 1987, "Promoting Health through Public Policy", which referred to the role of diet and nutrition in health. The trends in the Irish diet and international developments which impact on food production and supply were considered. The report recommended a multisectoral approach taking health, commercial and agricultural interests into account.
- (d) In 1991 the Health Promotion Unit (the successor to the Health Education Bureau) of the Department of Health produced a document on proposed nutrition education initiatives. "Nutrition Health Promotion Framework for Action" emphasised the need for the development of a national food and nutrition policy. It recognised that the formulation of such a policy would involve participation by trade, industry, agriculture, food scientists, health professionals, non-governmental organisations and the community. The Nutrition Advisory Group was established by the Department of Health in 1991 and began work on the formulation of this Food and Nutrition Policy for Ireland.
- (e) The nutrition policy of the Irish Heart Foundation outlined practical points required for the implementation of a policy in all sectors such as health, industry and education (Graham et al 1992). The report recommended the development of a co-ordinated national policy on nutrition.
- (f) The Report of the Expert Group on the Food Industry which was published by the Department of Agriculture, Food and Forestry in April 1993 also emphasised a multisectoral approach to food and nutrition policy. The group recommended "that farming and food processing representatives should be closely involved in national policy formulation and in on-going action and information on nutrition (including information on nutritional requirements in other EU Member States) so that dietary requirements

may be reflected as closely as possible in what is produced".

- (g) A comprehensive strategy for health entitled "Shaping a Healthier Future - A Strategy for Effective Healthcare in the 1990s" was published in 1994 (Department of Health 1994a). The aim is to make the health services more effective by reshaping the way they are planned and delivered in order to attain maximum health and social gain for the resources expended. A four year action plan with specific targets for health promotion and disease prevention will be implemented. A health promotion strategy was published in 1995 as well as a discussion document on women's health (Department of Health 1995a, 1995b).
- (h) Recent institutional changes in Ireland should assist the consultation process between the food sector and nutrition policy makers. An Bord Bia (the Irish Food Board) under the aegis of the Department of Agriculture, Food and Forestry, has responsibility to promote, assist and develop the marketing of Irish food.

2.7 Nutrition Surveillance in Ireland

The first nutrition surveillance unit in Ireland was set up in Trinity College Dublin in the mid-1980s with support from the Department of Health. Two reports were published by the unit on the nutritional status of the Irish population (Kelly, Kevany 1984; Kelly 1985).

The National Nutrition Surveillance Centre was established by the Department of Health in 1992 in the Department of Health Promotion in University College Galway. It is a centralised source of information with three functions (National Nutrition Surveillance Centre 1993):

- To provide relevant information in an accessible form at short notice;
- To monitor trends in health status, correlated with food supply and consumption and advise on these findings for health planners;
- To provide a source of information and research expertise, particularly in epidemiological or surveillance methodology to those wishing to mount specific projects such as microsurveys.

The annual reports from the National Nutrition Surveillance Centre (1993, 1994) provide a review of available data on nutrition-related diseases in Ireland, as well as on food production, supply and consumption.

2.8 The Food Safety Advisory Board

The Nutrition Advisory Group had almost completed its deliberations on a food and nutrition policy when the Statutory Instrument establishing the Food Safety Advisory Board was signed (Minister for Health 1995). The functions of the Board are set out as follows:

- To organise and administer a service for obtaining and assessing information as regards the safety of food;
- To organise and administer a service for obtaining and assessing information as regards zoonotic diseases;
- To advise the Minister of developments in domestic and European law relating to food;

- To advise the Minister on matters relating to food with particular reference to nutrition;
- To co-ordinate scientific co-operation with other European Union Member States in accordance with Council Directive 93/5/EEC;
- If requested by the Minister, to consider and report to him or her on arrangements to be made:
 - for ensuring that the control of food processing and handling is compatible with accepted safety standards,
 - for the registration and inspection of premises carrying on a food business;
- To undertake such other tasks as are consistent with its remit which the Minister for Agriculture, Food and Forestry and the Minister for the Marine may require.

It is timely that the Food Safety Advisory Board has been established just as the Nutrition Advisory Group completes this report on food and nutrition policy. The Board has a broad remit, encompassing food safety and nutrition. In the light of the experience of other countries, it will be vital that the organisational structures and responsibilities of the Food Safety Advisory Board and of other agencies should be clarified to ensure effective implementation of food and nutrition policy in Ireland.

Chapter

Nutrients for Health

Three

3.1 Introduction

The following is a short review of the sources of energy (macronutrients) in the diet. The main micronutrients (vitamins and minerals) are also described briefly. More detailed information may be found in a nutrition textbook, such as Shils, Olson and Shike (1994).

3.2 Energy

Energy intake is measured either in kilocalories (kcal) or megajoules¹ (MJ). Intake varies substantially from one individual to another. In adults, requirements depend on the amount of energy needed to maintain essential functions of the body (resting metabolic rate) and for physical activity. There should be a balance between energy intake and energy output; body weight should remain relatively stable. In infants and children energy is also needed for growth and development. During adolescence a rapid growth spurt occurs which requires additional energy. Some extra energy is also required during pregnancy though there seems to be an increase in efficiency of energy utilisation. Additional energy is also required for lactation. Energy needs decline in the elderly due to a combination of the metabolic effects of ageing and decreased physical activity.

Excess energy intake over a period of time may be associated with the development of overweight and, after further weight gain, with obesity. Body weight is also influenced by physical activity levels. Obesity, particularly in the context of a genetic predisposition and other lifestyle factors, is associated with increased risk of a number of diseases including diabetes mellitus and coronary heart disease.

3.3 Sources of Energy - the Macronutrients

The macronutrients - carbohydrate, fat, protein and alcohol - are the main sources of energy in the diet.

3.3.1 Carbohydrates

Carbohydrates are a major source of energy, providing approximately 17 kJ (4 kcal) per gram. The term encompasses two different types of food constituent - starches and sugars.

- Starches are an important component of the diet and can contribute up to 80% of total energy in some countries. They are required as the primary energy source of the body. Foods which contain a large amount of starch include bread, potatoes, cereals, rice and pasta. A diet which is very high in starch can be nutrient deficient and this can occur in conditions of extreme poverty.
- Sugars are soluble carbohydrates, either mono- or disaccharides. They have been classified into two types. Some sugars are incorporated naturally into the cell structure of the food, as in fruit or vegetables. Other types of sugars are not incorporated (naturally or artificially) into the food's cellular structure as in honey, fruit juices, table sugar and confectionery. The latter sub-group of sugars (principally sucrose) is associated with the development of dental caries.

¹ 1 kcal = 1000 calories 1 kilojoule = 1000 joules 1kcal=4.18kJ
1 MJ = 1 million joules 1 MJ = 239.2 kcal

3.3.2 Fat

Dietary fat is a source of energy providing 37 kJ (9 kcals) per gram. It is also a source of vitamins A, D, E and K, and provides the essential fatty acids.

Fats are made up of fatty acids. Depending on their molecular structure, fats may be classified into saturated fatty acids, monounsaturated fatty acids and polyunsaturated fatty acids.

Certain polyunsaturated fatty acids are deemed to be essential because they fulfil various metabolic roles in the body and yet cannot be synthesised by humans. These essential fatty acids are of two types - the n-6 series and the n-3 series. The former are found in high levels in most vegetable oils and the latter are found in high levels in fish oils and some seed oils. Examples of essential fatty acids are linoleic acid (18:2 n-6) and alpha-linolenic acid (18:3 n-3). A recent joint WHO/FAO (1995) report advises a balance between n-6 and n-3 essential fatty acids.

Fats can also be classified according to whether or not they contain trans or cis fatty acids. This terminology refers to the arrangement of the fatty acid molecule. Most fatty acids which occur naturally in food are cis. Trans fatty acids are formed from unsaturated fatty acids by a chemical process known as hydrogenation. This takes place during the manufacture of margarine from oils and also in nature in the rumen of cattle and sheep.

A wide range of foods provide fat in the Western diet. In some foods fat occurs naturally (e.g. milk, cheese, meat etc.) and in other cases fat is added during the manufacturing process (e.g. pastry, biscuits, chocolate etc.). In general most foods contain a mixture of all fatty acid types. Foods of animal origin generally contain a mixture of saturated fatty acids and monounsaturated fatty acids. Foods which contain polyunsaturated fatty acids are usually of vegetable origin. Fish oils are a major source of n-3 polyunsaturated fatty acids. Trans fatty acids come mainly from hydrogenated fat in margarines, especially hard margarines and in products made from them such as cakes, biscuits and confectionery. They occur naturally in dairy and meat products.

Diets high in fat are frequently also high in energy. If more energy is eaten in the diet than is used for growth and activity, the excess is stored as adipose (fat) tissue; this happens to a greater extent if the excess energy is consumed as fat, compared to energy derived from other sources.

There is substantial evidence of an association between fat intake and the development of arterial diseases such as coronary heart disease. A high intake of saturated fatty acids is associated with an increase in the level of total blood cholesterol and its components such as low density lipoprotein (LDL) cholesterol and very low density lipoprotein (VLDL) cholesterol. A high intake of trans fatty acids can lead to an increase in total cholesterol levels. A high polyunsaturated fatty acid intake (exceeding 13% of total energy) has been shown to decrease high density lipoprotein (HDL) cholesterol levels which is the beneficial carrier of fat in the blood. Very high intake of trans fatty acids can cause a slight decrease in HDL cholesterol. People with raised levels of total cholesterol, with raised LDL cholesterol or with low HDL cholesterol are at increased risk of coronary heart disease. This risk may be ameliorated by an adequate intake of antioxidant vitamins, for example Vitamin E (section 3.4.1.2). Risk is also affected by genetic and other lifestyle factors, such as smoking.

Diets high in fat have also been linked to increased risk of some cancers, such as cancer of the colon. However, it is unclear whether it is the fat per se which

is important; fat may act as a marker for other characteristics of such diets or may be one aspect of diet and lifestyle which increases risk.

3.3.3 Protein

Protein is not usually required for energy on a daily basis but it may be used as an energy source during starvation or other stresses on the body. It provides 17 kJ (4 kcal) of energy per gram. It is also necessary for growth and repair of body tissues. Amino acids are the building blocks from which proteins are made. Nine amino acids are described as being essential as they cannot be made by the body. The remaining amino acids can be made in the body as long as there is an adequate dietary intake of protein and essential amino acids. The main dietary sources of protein are meat, poultry, fish, eggs, cheese, peas, beans and lentils. The staple foods in the diet (bread and potatoes) have a lower protein content but are consumed in large amounts and so contribute to protein intake. A variety of protein-containing foods is required in the diet to provide sufficient protein and the necessary amino acid balance. Protein deficiency is rarely seen in Western countries unless there is a predisposing factor such as serious alcohol misuse, chronic intestinal disease, surgery or burns.

3.3.4 Alcohol

Alcohol yields 29 kJ (7 kcal) of energy per gram and most alcoholic beverages are high in energy. In addition to its contribution to energy and to body weight, alcohol intake raises blood pressure. High alcohol consumption can influence nutrient intake as alcohol can take precedence over food. People with alcohol-related problems are at risk from a range of chronic diseases in addition to the many social problems associated with alcohol misuse.

Micronutrients

There are many vitamins and minerals required for optimal body function - these are known as micronutrients. A deficiency of some micronutrients has been related to the development of disease. People who suspect they have a particular vitamin or mineral deficiency should contact a health professional for advice.

3.4.1 Micronutrients - The Vitamins

Vitamins are important dietary constituents. An adequate intake is achieved by eating a wide variety of foods. The common food sources of vitamins are shown in Tables 3.1 (water soluble vitamins) and 3.2 (fat soluble vitamins).

Table 3.1 Sources of Micronutrients: Water Soluble Vitamins

Micronutrient	Common Food Sources
Thiamin	All foods of plant and animal origin Rich sources: Cereals, nuts, peas, beans and other pulse vegetables
Riboflavin	Liver, milk, cheese, eggs and some green vegetables
Niacin	Widely found in plant and animal foods in small amounts
Vitamin B12	Almost all foods of animal origin
Folate	Rich sources: Liver, broccoli, spinach, cabbage, runner beans, peanuts and hazelnuts. Other sources: Bread, rice, oranges, bananas and breakfast cereals
Vitamin C	Citrus fruit, fresh fruit, fresh fruit juice and vegetables

3.4.1.1 Water soluble vitamins

Thiamin

This vitamin is required for the metabolism of carbohydrate, fat and alcohol. Thiamin is present in all whole natural foods of plant and animal origin. Rich sources of the vitamin are the germ of cereals, nuts, peas, beans and other pulses. Important amounts of the vitamin are found in all green and root vegetables, fruit, meat, poultry and dairy produce (except butter). Deficiency results in the development of beriberi and can arise if insufficient thiamin is taken in a diet which is high in carbohydrate. This is seldom seen in the Western world.

Riboflavin

Riboflavin is an essential requirement for biochemical reactions within the cells of the body. An inadequate intake of this vitamin can result in clinical signs including disorders of the mouth, skin and cornea. The best sources of riboflavin are liver, milk, cheese, eggs and some green vegetables. Deficiency is uncommon.

Niacin

The term niacin describes the active form of the vitamins nicotinic acid and nicotinamide. Nicotinic acid is widely distributed in small amounts in both animal and plant foods. Nicotinamide can be synthesised from the amino acid tryptophan. Niacin supports biochemical reactions in the body. A deficiency of the vitamin results in the development of pellagra, which manifests itself as a severe rash on the skin exposed to sunlight and any pressure areas (elbows, knees etc.). This condition is common in underdeveloped countries and, untreated, it may be fatal.

Vitamin B12

Vitamin B12 describes the physiologically active cyanocobalamin and other related substances which are involved in folate metabolism. A deficiency of vitamin B12 can result in anaemia and in neurological dysfunction as it is required for nerve function. Most of the vitamin B12 in the body (about 80%)

is stored in the liver. Animal products are the only dietary sources of vitamin B12, so strict vegetarians who consume no animal products are at risk of a deficiency. Other groups at risk are those with alcohol-related problems, breastfed babies whose mothers are vegans or vegetarians and individuals with malabsorption syndromes which interfere with intrinsic factor¹ production.

Folic Acid

Folic acid, which is found in foods as folate, is needed for the metabolism and synthesis of some amino acids and other tissue components. Folate deficiency has an effect on rapidly regenerating tissues and is especially important in babies and young children. Nutritional megaloblastic anaemia, one cause of which is folate deficiency, is common in underdeveloped countries.

Good sources of dietary folate include liver, broccoli, spinach, cabbage, runner beans, peanuts and hazelnuts. Other sources include bread, rice, oranges and bananas. Many breakfast cereals are supplemented with folate.

Low maternal folate levels very early in pregnancy increase the risk of a defect in the development of the neural tube in the foetus, resulting in anencephaly or spina bifida. The risk of neural tube defect is reduced by taking a daily supplement of 400ug of folic acid before conception and in early pregnancy, in addition to the normal dietary intake of folate. A leaflet on this topic is available from the Health Promotion Unit (Department of Health 1994b).

Vitamin C

Classical roles of ascorbic acid (vitamin C) are the prevention of scurvy, the promotion of wound healing and enhancement of the absorption of non-haem iron. Another role in human metabolism is as an antioxidant vitamin i.e. it prevents the attachment of oxygen to other molecules. It is an essential factor in a series of oxidative enzyme reactions for numerous different metabolic functions.

Fresh fruit, especially citrus fruits, and vegetables are excellent dietary sources of vitamin C. As ascorbic acid is easily oxidised the vitamin can be lost from food during storage, preparation and cooking. Deficiency resulting in clinically evident scurvy is seldom seen in the developed world. Research is ongoing into whether a high intake of vitamin C reduces risk of developing some diseases, for example coronary heart disease.

Table 3.2 Sources of Micronutrients: Fat Soluble Vitamins

Micronutrient	Common Food Sources
Vitamin A	Liver, fish liver oil, dairy products; some vegetables and fruits (β-carotene)
Vitamin D	Fatty fish, eggs, fortified foods such as margarine and milk
Vitamin E	Vegetable oils and margarine
Vitamin K	Green leafy vegetables

¹Intrinsic factor is produced by cells in the stomach and is required for the absorption of vitamin B12.

3.4-1.2 Fat soluble vitamins

Vitamin A

This vitamin is found in two forms, preformed vitamin A called retinol (found in liver, fish liver oils and dairy products) and B-carotene which is present in plant foods and is a dietary precursor of vitamin A. B-carotene is an antioxidant vitamin which is required for numerous biochemical reactions at a cellular level. Vitamin A deficiency can result in night blindness and other eye disorders, although these take a long time to develop. Smokers who subsequently develop lung cancer have lower levels of vitamin A in their blood but it is unclear if this is a cause or a result of the cancer. Excess intakes of vitamin A during pregnancy can result in congenital defects in the baby.

Vitamin D

The active form of vitamin D promotes calcium absorption from the gastrointestinal tract and influences bone formation. A deficiency of vitamin D can result in the development of rickets in children and osteomalacia in adults. Dietary sources of vitamin D include fatty fish, eggs and fortified foods such as margarines and milk. Most of the requirement, however, is met by the sun's ultraviolet rays transforming a constituent of the skin into vitamin D. Vitamin D status is therefore related to the time spent out of doors during the day and is influenced by factors such as mobility and inclement weather.

Low levels of vitamin D can still occur in the developed world. Deficiency can develop in the elderly due to low exposure to sunlight and dietary inadequacies. Vitamin D supplements, in addition to dietary intake, may be indicated in some elderly people, in women who are pregnant or breastfeeding, and in infants and young children (Panel on Dietary Reference Values 1991).

Vitamin E

The function of vitamin E is carried out by two types of derivatives, the tocopherols and the tocotrienols. These act as antioxidants to prevent damage which may be caused to tissues when molecules such as lipids (containing fat) react with oxygen. The requirement for the vitamin is largely dependent on the amount of polyunsaturated fatty acids in the diet. The dietary sources of vitamin E are vegetable oils, including wheat germ, sunflower seed, cotton seed, safflower, palm, rapeseed and other oils. Margarines made from vegetable oils are a major source of vitamin E in the Western diet. Deficiencies are seldom seen but some of the symptoms include a progressive neurological syndrome involving the central and peripheral nervous systems, retina and skeletal muscles.

Vitamin K

There are two different forms of vitamin K, the phylloquinones which are found in plants and the menaquinones which are produced by intestinal bacteria. The vitamin is required for the regulation of blood clotting. Deficiency can result in abnormal bleeding. Most of the population have adequate levels of vitamin K. Rich sources of phylloquinone include green leafy vegetables.

3.4-2 Micronutrients - the Minerals

These are found in everyday foods. A varied diet will ensure an adequate intake of minerals. Table 3.3 contains a summary of mineral sources.

Table 3.3 Sources of Micronutrients: Minerals

Micronutrient	Common Food Sources
Iron	Haem: Meat, poultry, fish, offal Non-haem: Pulses such as peas, beans, lentils and fortified cereals
Calcium	Milk, fortified milk, cheese, yoghurt and some vegetables
Iodine	Milk, seafood and fortified salt
Flouride	Tea, carbonated drinks and drinking water*
Trace Elements	All foods as part of a varied diet

*Depends on source of water

Iron

Iron is required by the body as a component of haemoglobin and myoglobin and functions as a carrier of oxygen in blood cells and muscle. There are two types of iron in the diet. Haem iron is present in meat, poultry and fish and is well absorbed from these foods. Non-haem iron is found in foods of vegetable origin and is less well absorbed. An adequate intake of ascorbate (vitamin C) can improve iron absorption. A mixed and varied diet will ensure sufficient iron intake.

The need for iron may be greater than the amount consumed in those with increased physiological requirements such as infants, toddlers, adolescents, women of reproductive age, during pregnancy and in the elderly. Iron deficiency may result in anaemia and may be associated with growth retardation.

Calcium

The primary role of calcium in the body is as a structural component of bones and teeth. It is also found in tissues and fluids where it has important functions in cell metabolism. The main dietary sources are dairy products such as milk, cheese and yoghurt. Calcium is also found in some green vegetables.

Adequate calcium intake is required for bone growth and development during childhood and adolescence. Insufficient dietary calcium, especially with inadequate physical activity, is associated with the development of osteoporosis, particularly in women.

Iodine

Iodine is an essential element especially for the development of the central nervous system before birth. A deficiency of iodine intake at this time can result in suboptimal growth and development of the child. This is a serious public health problem in some underdeveloped countries and parts of Eastern Europe. Milk, seafish and other seafood are rich sources of iodine. It is efficiently absorbed from the normal diet. Salt may be fortified to increase

iodine intake, particularly in regions with low soil iodine concentrations.

Fluoride

Water is the most important source of fluoride. The dietary intake of fluoride is usually low, coming mainly from tea, fish, processed foods and beverages. Bottled drinking water contains highly variable amounts of fluoride depending on the source. High concentrations of fluoride may occur naturally. As a public health measure to prevent dental caries, there has been a mandatory requirement on local authorities since 1963 to adjust the level of fluoride in drinking water to one part per million. The improvement in the dental health of children and adults over the past 30 years is attributed to the National Fluoridation Programme and to the widespread use of fluoride toothpaste. There are no other known roles for fluoride in the body.

Trace Elements

Trace elements such as manganese, molybdenum, chromium, selenium, copper and zinc are essential components of enzymes (except for chromium) and are obtained in trace amounts from a mixed diet. Research into their role in the diet has been reviewed by the Panel on Dietary Reference Values in the UK (1991). Though the trace elements have a wide variety of metabolic functions in the body, deficiencies in the healthy adult population are rare.

3.4.3 Dietary Fibre

Dietary fibre is a non-specific term for that fraction of dietary carbohydrate which cannot be digested in the human small intestine. An adequate intake of dietary fibre is required to maintain bowel function. It has a laxative effect; a high fibre diet can be used in the treatment of constipation. The relationship between low intakes of dietary fibre and diseases such as diverticular disease, appendicitis and large bowel cancer has been studied. However it is difficult to separate the effects of dietary fibre from those of other aspects of diet and lifestyle. Important sources of dietary fibre include cereal (especially wholegrain) products, bread, potatoes, and fruit and vegetables.

Chapter

Diet, Health and Disease in Ireland

Four

4.i Current Diet in Ireland

The main source of data on the modern Irish diet is the Irish National Nutrition Survey (Irish Nutrition and Dietetic Institute 1990) which collected data from 676 adults aged 18 to 60+ years and 538 young people aged 8 to 17 years. The diet history method was used to estimate usual diet. This was supplemented by food photographs to estimate the size of portions consumed. The recommended dietary allowances (RDAs) used in the Irish National Nutrition Survey are shown in Appendix 2. Tables 4.1 and 4.2 summarise some of the important findings of the survey. When examining data from the Irish National Nutrition Survey it should be noted that the number of subjects within each subgroup was quite small.

4.1.1 Energy

The energy intake in males was much higher than that in females. Energy intake was highest in males between the ages of 15 and 24 years who had an intake above the recommended dietary allowance. For men over the age of 25 years the energy intake was similar to the recommended dietary allowance.

The energy intake in females in the 12 to 17 year age group was slightly higher than in older women and was similar to the recommended dietary allowance. Women over 18 years had an energy intake well below the recommended dietary allowance for women.

The sources of energy in the diet were similar for males and females, with bread, meat, meat products and milk being major contributors (Figure 4.1). Potatoes were important sources of energy; a substantial proportion of potato consumption in the under 25s was in the form of chips. Biscuits, cakes, table sugar and confectionery (sweets and chocolate) also made a substantial contribution to total energy intake.

Table 4.1 Mean Nutrient Intakes in Irish Males

	Age (years) Number Surveyed	8-11 n=85	12-14 n=93	15-17 n=73	18-24 n=51	25-39 n=85	40-59 n=87	60+ n=82
Energy Intake	MJ (Kcals)	9.7 (2,397)	11.3 (2,709)	14.0 (3,342)	13.7 (3,273)	12.7 (3,035)	10.6 (2,526)	9.5 (2,262)
Carbohydrate Intake	% Energy (g/day)	50.1 (310)	50.3 (262)	49.3 (438)	45.6 (393)	45.0 (363)	46.3 (310)	48.6 (292)
Fat Intake	% Energy (g/day)	36.0 (94)	36.3 (110)	36.0 (135)	35.5 (133)	36.2 (123)	34.3 (98)	33.4 (85)
Protein Intake	% Energy (g/day)	13.8 (79)	13.3 (90)	14.2 (117)	13.6 (111)	14.9 (112)	15.2 (94)	15.0 (84)
Alcohol Intake	% Energy (g/day)				5.4 (22.6)	3.9 (16.7)	4.1 (14.7)	2.9 (9.7)
Iron Intake	(mg/day)	12.9	14.7	19.3	15.4	15.0	13.1	11.2
Dietary Fibre Intake	(g/day)	16.7	19.7	25.4	22.1	20.2	19.6	20.1

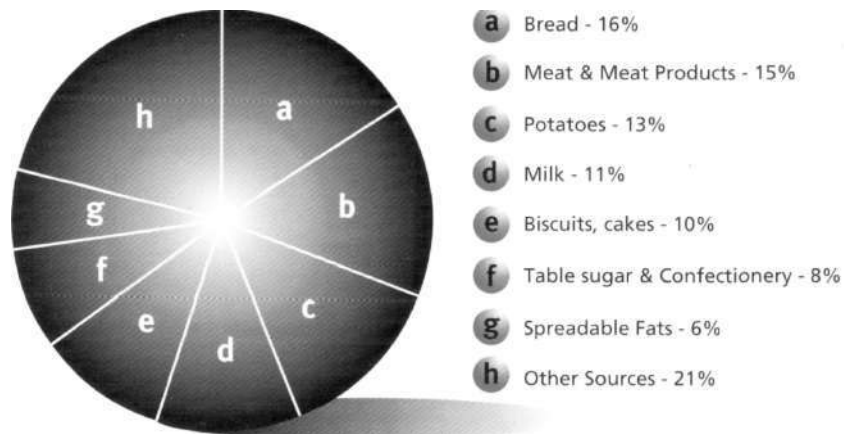
Source: Irish Nutrition and Dietetic Institute 1990

Table 4.2 Mean Nutrient Intakes in Irish Females

	Age (years) Number Surveyed	8-11 n=63	12-14 n=114	15-17 n=110	18-24 n=54	25-39 n=122	40-59 n=111	60+ n=84
Energy Intake	MJ (Kcals)	8.4 (1,997)	9.1 (2,181)	8.9 (2,139)	8.6 (2,048)	7.7 (1,842)	7.3 (1,748)	7.2 (1,710)
Carbohydrate Intake	% Energy (g/day)	50.6 (267)	50.2 (293)	48.9 (278)	46.8 (256)	46.4 (256)	47.6 (220)	49.1 (226)
Fat Intake	% Energy (g/day)	35.8 (80)	36.0 (88)	37.1 (89)	36.4 (85)	35.3 (73)	34.6 (70)	33.8 (65)
Protein Intake	% Energy (g/day)	13.6 (68)	13.7 (73)	13.9 (73)	14.5 (71)	16.0 (72)	16.1 (68)	16.4 (67)
Alcohol Intake	% Energy (g/day)				2.2 (5.9)	2.2 (5.9)	1.4 (3.6)	0.7 (1.6)
Iron Intake	(mg/day)	11.0	12.4	11.6	10.8	10.8	10.0	9.8
Dietary Fibre Intake	(g/day)	14.5	17.4	17.3	15.6	16.5	16.7	18.2

Source: Irish Nutrition and Dietetic Institute 1990

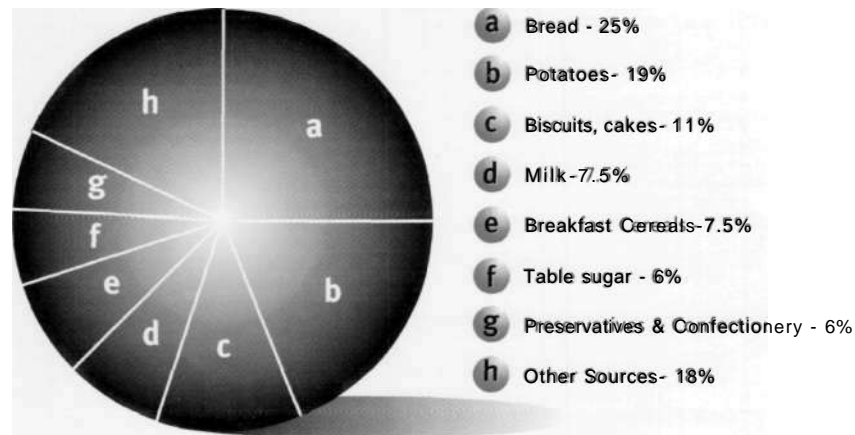
Figure 4.1 Main Sources of Energy in the Irish Diet



4.1.2 Carbohydrates

Approximately half of total energy intake was obtained from carbohydrates by males and females aged 8 to 15 years and by those in the 60+ years age group. Carbohydrate intakes were proportionately lower in the intervening age groups. The main sources of carbohydrates in the diet were bread, potatoes and biscuits, pastries and cakes (Figure 4.2).

Figure 4.2 Main Sources of Carbohydrate in the Irish Diet



4.1.3 Fat

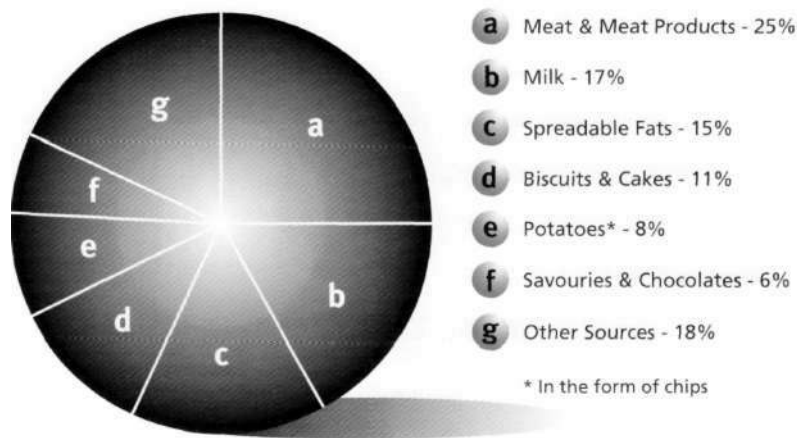
Despite the fact that women consumed less fat in grams per day than men, their fat intake as a percentage of total energy intake (including alcohol sources) was slightly higher than that of men in all age groups except for those aged 25 to 39 years. Men in this age group and females in the 15 to 17 year age group obtained the highest percentage of their energy from fat compared to all other age groups.

The percentage energy in the diet from fat is higher if alcohol is removed from the calculations and only energy derived from food is considered. It reached a peak of 36% to 37% energy in the 40 to 59 year age group in both men and women. Fifty-five per cent of those over 60 years of age had fat intakes between 30% to 35%. In the Kilkenny Health Project seven day weighed dietary survey of 35 to 44 year olds, fat intake (excluding alcohol) was 39.7% of total energy in women and 38.8% in men, giving higher estimates than the Irish National Nutrition Survey (Gibney, Moloney, Shelley 1989). It is possible that the Irish National Nutrition Survey underestimated the percentage energy derived from fat.

- Meat and meat products were the main sources of fat in the Irish National Nutrition Survey and men consumed more meat than women (Figure 4.3).
- Milk was the next largest source of fat in the diet, especially in the 8 to 11 year age group. The contribution of milk to total fat intake was lower in the 18 to 24 year age group of women compared to men, reflecting the low intake of milk in this group. Older women had higher intakes of fat intake from milk.
- In all age groups spreadable fats were consumed in larger quantities by men. The range was from 16% to 23% of total fat intake for men compared to 11% to 17% for women. Margarine contributed 3% of fat intake and butter contributed 14% in males and 9% in females.
- Biscuits, cakes and pastries accounted for 11 % of fat.
- Potatoes in the form of chips contributed 7% of fat intake in the 8 to 24 year age group compared to 2% in the 60+ groups.

Savoury snacks and chocolate were major sources of fat in the diets of young males (10%) and females (12%) aged 12 to 24 years.

Figure 4.3 Main Sources of Fat in the Irish Diet

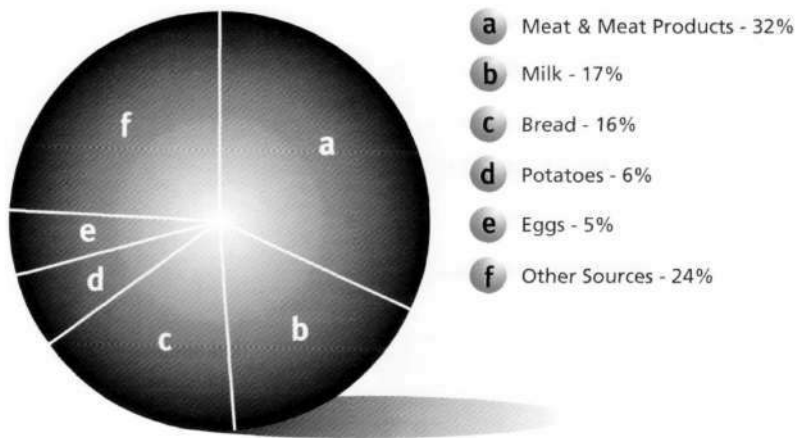


4.1.4 Protein

The protein intake in both sexes was above the recommended dietary allowance up to the age of 40 years. Consumption declined with age in older men but there was only a small decline with age in women. The contribution of protein to total energy intake increased from 13% in 8 to 12 year olds to 15% in men and to 16% in women over the age of 40 years.

The sources of protein in the diet are shown in Figure 4.4. The contribution of meat to protein intake was lowest in females between the ages of 18 to 24 years (29%) and highest in males between the ages of 25 to 59 years (41%). Bread was an important source of protein in the 60+ age group (21%). Overall, seafood contributed less than 5% to protein intake.

Figure 4.4 Main Sources of Protein in the Irish Diet



4.1.5 Alcohol

Alcohol intake was highest among 18 to 24 year old males at 23 g/day and in females of the same age at 6 g/day. Consumption was 50% lower in those aged 60 or over in both sexes and the alcohol consumption of women was 25% that

of men in each of the age groups. There were differences between men and women when the contribution of alcohol to total energy intake was examined. In women in the 18 to 39 years age group 2.2% of energy came from alcohol. This fell to 1% in the over 60 age group. In 18 to 24 year old males, 5.4% of energy came from alcohol and this declined to 2.9% in males over 60 years.

4.1.6 Micronutrients

When vitamin A, thiamin, niacin, riboflavin and vitamin B12 were examined in the Irish National Nutrition Survey the mean (average) and median (central) intakes were approximately equal to or greater than the recommended dietary allowances (Irish Nutrition and Dietetic Institute 1990). The micronutrients which will be examined here are those for which a deficiency or excess intake was found compared to the recommended dietary allowance. Fifteen per cent of females were taking a vitamin or mineral supplement but no further information on this was provided in the report.

4.1.6.1 Water Soluble Vitamins

Vitamin C

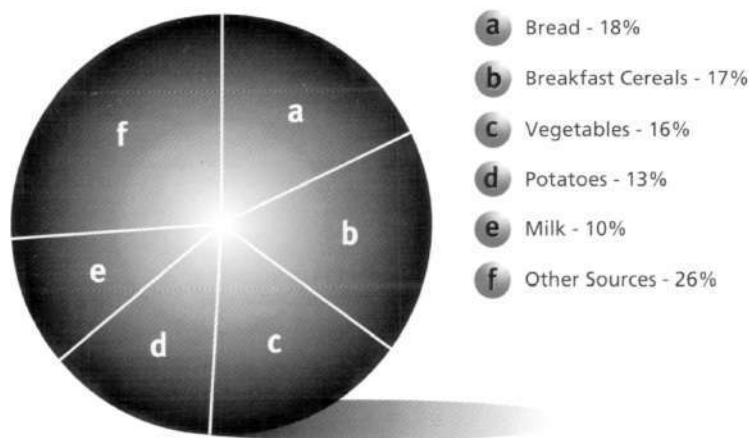
Vitamin C was largely obtained from potatoes (42% in men and 31% in women), other vegetables (18% in men and 30% in women) and fruit (17% in women and 23% in men). Vitamin C intake in all age groups was above the recommended dietary allowance.

Folate

Ninety per cent of women had a folate intake below the recommended dietary allowance (200 ug/day under 10 years and 300 ug/day thereafter). In view of the role of folic acid in reducing risk of neural tube defect (see section 3.4.1.1), the Department of Health has recommended that women of childbearing age who could become pregnant should take 400 ug/day of folic acid as a daily supplement to their intake from food.

The main sources of folate in the Irish diet were bread, breakfast cereals, vegetables, potatoes and milk (Figure 4.5).

Figure 4.5 Main Sources of Folate in the Irish Diet



4.1.6.2. Fat Soluble Vitamins

Vitamin D

Dietary sources of vitamin D in the Irish National Nutrition Survey included spreadable fats (26%), eggs (24%), breakfast cereals (23%), and buns, cakes and pastries (10%). The dietary intake was below the recommended dietary allowance (RDA) in all age groups. However, the RDA requires review. Most vitamin D is obtained from the action of ultraviolet light on the skin. The Panel on Dietary Reference Values (1991) in the UK did not recommend a necessary dietary intake for individuals living a normal lifestyle. Vitamin D supplements, in addition to dietary intake, may be indicated in at risk groups, such as the elderly, women who are pregnant or lactating, and infants and young children.

Vitamin E

Vitamin E intake was below the RDA of 10 mg/day, especially in older age groups. However, the current RDA may be higher than necessary. Vitamin E requirements are determined by the polyunsaturated fatty acid (PUFA) content of the diet. In addition, foods rich in PUFAs tend to contain large amounts of vitamin E. The Panel on Dietary Reference Values in the UK (1991) estimated that current intakes of vitamin E are likely to be adequate. However, the RDA should be kept under review in view of the antioxidant function of vitamin E and its potential protective role against coronary heart disease and cancer.

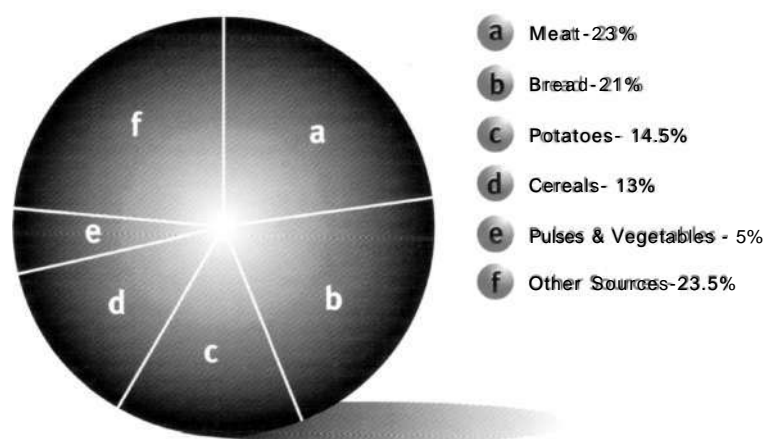
4.1.6.3 Minerals

Iron

Because of their lower total energy intake and their food choices, average iron intake in females was below the recommended dietary allowance of 14 mg/day. The intake was 12.4 mg/day in the 12 to 15 year age group and 9.8 mg/day in the 60 plus age group. Three quarters of women aged 12 to 59 years had iron intakes below the recommended dietary allowance.

The main sources of iron in the diet are shown in Figure 4.6. Meat consumption was lower in females than in males, even allowing for the lower total energy intake in women. Those on low incomes and the unemployed had lower intakes of iron per 10 MJ of energy than other groups.

Figure 4.6 Main Sources of Iron in the Irish Diet



Calcium

Calcium intake was adequate in all age groups except in 12 to 17 year old females for whom the recommended dietary allowance is 1200 mg/day and the intake was 950 mg/day. The main sources of calcium were milk (44%) and bread (15%).

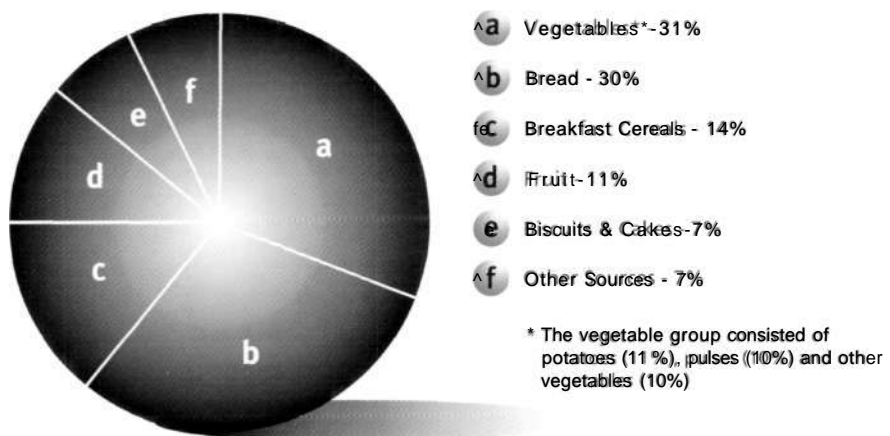
4.1.7 Dietary Fibre Intake

Dietary fibre intake decreased with age. Intake in women was lower than in men, but this difference decreased with increasing age.

On the basis of fibre intake per 10 MJ of energy (fibre density), the intake of dietary fibre was similar for males and females between the ages of 8 and 17 years. The fibre density of women's diets increased gradually with age. The fibre density of the diet was lower in men in their twenties compared to the teenage years but intakes were higher in older men.

The largest source of dietary fibre was vegetables, contributing 31% to total intake. Within the vegetable group, potatoes contributed 11%, pulses 10% and other vegetables 10% of total dietary fibre intake (Figure 4.7). Bread was also an important source of dietary fibre.

Figure 4.7 Main Sources of Dietary Fibre in the Irish Diet



4.2 Changes since the National Nutrition Survey 1946 - 1948

Two national nutrition surveys have been carried out in Ireland. The first, the National Nutrition Survey, was done from 1946 to 1948 and involved 2,983 people. The findings of the second survey are summarised in section 4.1 above (Irish Nutrition and Dietetic Institute 1990); that survey included 1,114 people.

Different methodologies were used but some comparisons can be made between the two surveys (Table 4.3) (Moloney 1992). The 1946 to 1948 survey found a higher energy intake compared to the more recent survey. This was consistent with the greater energy needs at the time of the earlier survey due to more physical labour, fewer cars and other forms of transport, fewer labour saving devices, poor housing, lack of heat and insulation. It should be noted that there were still some post-war supply problems during the first survey. The foods affected were sugar, butter, margarine, flour and bread.

Comparison of the foods consumed shows a higher consumption of milk,

potatoes, eggs and vegetables in the first survey. The higher milk and potato consumption may be attributed to the higher percentage of farming families taking part. Also, in the 1940s there was relatively few shop goods. Thus, comparison between the two national surveys indicates a diet in 1946 to 1948 which was higher in complex carbohydrates and dairy products than in the more recent survey. There was also a substantial reduction in iron and calcium intake between the two national surveys.

Table 4.3 Average nutrient intakes per person in the two Irish Nutrition Surveys

Year	Energy/ day (MJ)	Protein (%)	Fat (%)	CHO* (%)	Iron mg/day	Calcium mg/day
1946-1948 (NNS ¹)	13	13	29	58	20	1369
1990 (INNS ²)	9	15	36	49	12	1075

¹ NNS = National Nutrition Survey 1946-1948
² INNS = Irish National Nutrition Survey, 1990
 * CHO = Carbohydrate

4.3 Comparisons with other European Countries

4.3.1 Nutrition Surveys

A variety of methods were used in national nutrition surveys in different European countries. However, some comparisons can be made between the intake of nutrients by different populations. These have been combined into a database, Nutrifile, by Nutriscan (1993). The daily nutrient intake in several countries of the European Union is shown in Table 4.4. Irish nutrient intakes are similar to those in the United Kingdom and Northern Ireland. The energy and nutrient intakes of most other countries are slightly higher than those in Ireland, except for calcium. Some of these differences may be explained by variations in different dietary survey methods.

Table 4.4 Average Daily Adult Nutrient Intakes in some European Countries*

Country	Energy (MJ)	Protein (g)	Fat (g)	CHO** (g)	Dietary Fibre (g)	Iron (mg)	Calcium (mg)	Vit. C (mg)
Ireland	9.7	85	92	291	19	12	1030	73
Belgium	10.4	84	116	240	21	15	810	97
Denmark	11.3	90	128	268	25	16	1684	69
Germany	8.8	74	93	223	25	13	687	88
Italy	11.4	98	108	326	21	15	936	120
Netherlands	10.1	80	110	254	24	12	1062	73
Portugal	10.7	82	98	347	NA***	13	691	111
Spain	12.7	97	145	332	22	15	883	134
United Kingdom ¹	8.7	73	88	232	22	12	831	64
Northern Ireland	8.7	71	90	239	18	12	NA***	NA***

*Data obtained from national nutrition surveys, adapted from Nutrifile, Nutriscan 1993
 CHO = Carbohydrate, *NA = Not available ¹United Kingdom data does not include Northern Ireland

4-3-2 Food Consumption

WHO Eurostat figures are based on national food balance sheets and show trends in food data for recent decades (National Nutrition Surveillance Centre 1993, 1994). In Ireland, larger quantities of liquid milk are consumed per capita than in other EU countries though the intake of butterfat decreased sharply in the mid-1980s. The consumption of cheese and yoghurt in this country is the lowest in the EU. There has been a steady increase (46% per capita) in the consumption of fruit since the early 1960s. However, levels of fruit and vegetable intake in this country are still quite low compared to our European counterparts. Traditional fruit and vegetables are still strongly favoured with a small growth in the popularity of 'minor crops' such as peaches or courgettes. The per capita consumption of meat and meat products has increased since the 1960s. Potato consumption declined during the 1970s but subsequently increased. Recently there has been an increase in the intake of pasta and rice as alternative starch sources. Fish consumption remains low compared to other EU countries (Fernandez-Celemin et al 1995).

4.4 Physical Activity Levels

Apart from growth or illness, physical activity is the main determinant of energy needs. Body weight remains stable when energy intake is appropriate for the level of energy usage.

Physical activity is perceived as being important to health by the general public (Kearney 1994, Conroy et al 1994). The Happy Heart National Survey 1992 (Happy Heart Research Committee 1994) found that for those in paid employment, about one quarter of men and one third of women were sedentary during an average day at work. Those living in urban areas were more likely to be sedentary at work compared to those in rural areas.

Approximately four out of ten adults were sedentary at leisure, on the basis of taking less than four hours exercise of moderate intensity weekly. One in five were classified as being sedentary when those who engaged in any form of leisure activity were categorised as being active. Slightly more of those in the 50 to 69 year age group were sedentary. More of those in the manual social classes were sedentary at leisure, this difference being most marked in women.

Watson (1990) studied Irish post-primary schoolchildren and found 25% of the boys and 33% of the girls seriously lacking in aerobic fitness. A study in Northern Ireland illustrated that girls of all ages seldom participated in vigorous physical exercise (Riddoch et al 1991). Hope (1994) concluded that the involvement and interest of girls in sport during childhood strengthens the likelihood of continued participation in adulthood.

It is likely that a substantial proportion of the population, young and old, are habitually sedentary and unfit. Further research is necessary to provide baseline information on fitness and activity levels to monitor progress towards attainment of the targets for activity in the national health strategy (Department of Health 1994a).

4.5 Nutrition, Health and Disease in Ireland

The National Nutrition Surveillance Centre has reported on trends in mortality (death) and morbidity (sickness) rates for those conditions where diet plays a major role (National Nutrition Surveillance Centre 1994). Cardiovascular

diseases, mainly coronary heart disease and stroke continue to be the main causes of death in Ireland - 45% of all deaths in 1993. While rates are declining, mortality in Ireland from coronary heart disease continues to be substantially higher than in most other European countries. The morbidity data presented by the National Nutrition Surveillance Centre show increasing hospital admission rates attributed to cardiovascular disease.

Although overall cancer mortality rates are not among the highest in Europe, cancer is the second highest cause of death in Ireland and accounted for nearly one in four of all deaths in 1993. The most common cancers for which there is evidence of a link with diet were those of the colon, rectum, stomach and oesophagus in men and cancer of the breast, colon and rectum in women.

The aetiology of cancer is complex and still under investigation. It is likely that various genetic and environmental factors will be implicated, depending on the site, as well as dietary factors. However, the type of diet which is recommended to promote health and to prevent other diseases, such as coronary heart disease, stroke and diabetes mellitus, will probably also prove to be protective against those common cancers which are diet-related.

The National Nutrition Surveillance Centre 1994 report also presents hospital discharge data for other nutrition-related diseases. Fractures, which may or may not be associated with osteoporosis, accounted for the majority of these diseases, followed by diabetes mellitus and diseases of the teeth.

4.6 Smoking

The national health strategy, the health promotion strategy and the discussion document on women's health (Department of Health 1994a, 1995a and 1995b) all place emphasis on smoking as the chief cause of premature death in Ireland.

Cigarette smoking is associated with a different food pattern and altered nutrient intake compared to non-smoking; smokers consume more saturated fat and have a lower intake of polyunsaturated fat and of antioxidant vitamins (Thompson et al 1992). The increased intake of damaging chemicals from cigarette smoke, together with the lower intakes of dietary antioxidants, may account for the acceleration of arterial disease in smokers compared to non-smokers.

Stopping smoking has been shown to lead to an increase in body weight although this is not true for all smokers. Changes in metabolism and altered eating habits appear to contribute to weight gain. After stopping, weight gain may continue for up to one year, after which some of the weight may be lost before equilibrium is reached.

Smokers planning to stop should be reassured that a large gain in weight is not inevitable. They should be reminded that the benefits to health from stopping smoking are substantially greater than any additional risk as a result of an increase in body weight. Those stopping smoking should be advised to pay particular attention to their eating habits, to make healthier food choices and to take regular exercise.

Chapter

Dietary Guidelines

Five

5.1 Introduction

The Nutrition Advisory Group gave consideration to setting quantitative targets for macronutrient intakes by the population. It was decided that at present there is inadequate information on nutrient intakes and on the rate of dietary change in recent years to permit such targets to be set. Furthermore, many people have difficulty in interpreting numeric targets and in estimating the extent of proposed change. It would, however, be useful for the Food Safety Advisory Board to reconsider this issue as progress can best be evaluated when the desired end results are clearly defined.

The Nutrition Advisory Group proposes two sets of qualitative guidelines:

- The first set of guidelines apply to the general population;
- Guidelines for special groups are also provided in view of the specific dietary requirements of some groups and the prevalence of disease or deficiencies in others.

5.2 General Dietary Guidelines

5.2.1 Variety of Food

By incorporating a wide variety of foods in the diet most dietary requirements will be met. The diet should be based on fresh foods as far as possible. It is important to taste food before seasonings are added. Herbs and spices including pepper can enhance the flavour of food. Reliance on salt to flavour food is not recommended.

Guideline 5.1

Eat a wide variety of foods.

5.2.2 Food and Exercise

Food provides energy or fuel for the body. It is recommended that a high energy intake, to ensure an adequate intake of nutrients, be balanced with sufficient physical activity to maintain a healthy weight.

Exercise should be incorporated into the daily routine on at least five days a week. This will not only improve physical fitness and wellbeing but can also protect against a number of diseases including coronary heart disease and osteoporosis.

Guideline 5.2

- Balance energy intake with physical activity levels.

5.2.3 Fruit and Vegetables

Irish people have very low intakes of fruit and vegetables, in comparison to

those living in Southern European countries. Fruit and vegetables are rich sources of micronutrients such as folic acid and the antioxidant vitamins - B-carotene (vitamin A), vitamin E and vitamin C. There is evidence that these antioxidant vitamins play a role in the prevention of coronary heart disease and certain cancers. Adequate intake of folic acid in early pregnancy reduces the incidence of neural tube defects in the newborn. Fruit and vegetables are also rich sources of dietary fibre. Four or more servings¹ of fruit or vegetables per day are likely to provide adequate amounts of these nutrients.

Guideline 5.3

Eat plenty of fruit and vegetables. Aim to eat at least four servings every day.

5.2.4 Starchy Foods

Starchy foods include bread, potatoes, rice, cereals, cereal-based foods, fruit and vegetables. Research shows that many Irish people restrict their intake of the starchy foods because they perceive these foods to be "fattening". However, there is substantial evidence that diets rich in carbohydrates are less likely to lead to excess weight gain compared with diets which are high in fat. People, especially those who are physically active, are advised to eat more starchy foods to ensure an adequate intake of energy, vitamins and dietary fibre.

It is recommended that frequent consumption throughout the day of foods containing sugar be avoided to reduce the risk of dental caries, particularly among children.

Guideline 5.4

Starchy foods such as bread (preferable wholemeal), cereals, pasta and rice, as well as fruit and vegetables, should be eaten daily. Frequent consumption throughout the day of foods containing sugar should be avoided, especially by children.

5.2.5 Fat

There is a need to reduce the total fat intake of the Irish population and to attain an appropriate balance of fats in the diet (see section 3.3.2). This should be achieved primarily by reducing the intake of saturated fats.

The fat content of food can be decreased by using appropriate cooking methods. Boiling, braising, baking, steaming or poaching may be used to reduce fat intake. Microwave ovens can also reduce the amount of fat used in cooking.

If fat is added to foods, using an unsaturated oil or spread, either monounsaturated or polyunsaturated, improves the balance of fat in the diet. Oily fish is a good source of unsaturated fats and of some essential fatty acids.

¹ serving = 1/2 glass fruit juice, 2 tablespoons cooked vegetables or salad (minimum), small bowl of homemade vegetable soup, 1 medium sized fresh fruit, 2 tablespoons cooked fruit.

Salad dressings based on unsaturated oils may be substituted for traditional mayonnaise or salad cream which are high in saturates.

Much of the fat (especially saturated fat) eaten in Ireland is consumed in confectionery, biscuits and cakes. These foods are also likely to provide a substantial proportion of the trans fatty acids in the Irish diet (see section 3.3.2).

Starchy foods such as bread, potatoes and cereals, fruit and vegetables are all low fat foods. Other low fat choices include lean meat, fish and chicken. Foods with a fat content lower than the original product are becoming increasingly available.

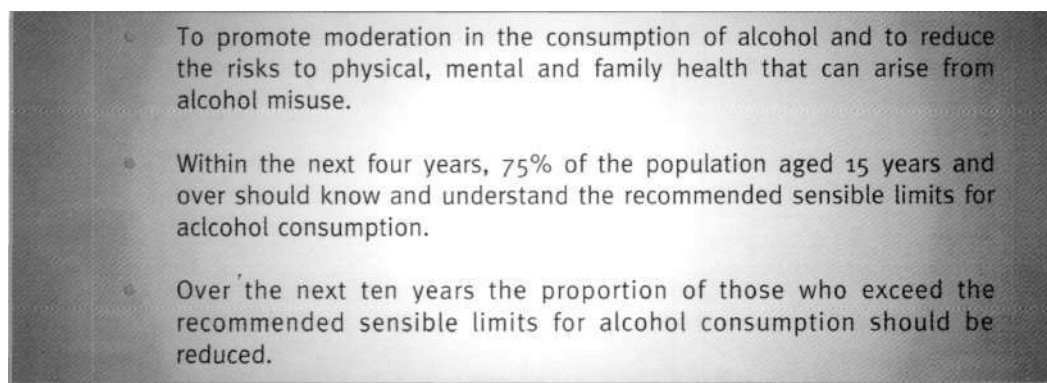
Guideline 5.5

Total fat intake should be reduced, with emphasis on reducing saturated fats. Some saturated fat may be replaced by unsaturated fats. Oily fish is a good source of unsaturated fats as well as some essential fatty acids. Current evidence suggests that there should be no increase in trans fatty acid intake.

5.2.6 Alcohol

The Department of Health intends to publish a policy document on alcohol. Consequently, the Nutrition Advisory Group does not wish to make any recommendation on alcohol consumption at this time. However, the Group endorses the three targets for alcohol intake by the general population set in the national health strategy document "Shaping a Healthier Future" (figure 5.1); these targets are endorsed in the national health promotion strategy document (Department of Health 1995a).

Figure 5.1 Targets for Alcohol Intake

- 
- To promote moderation in the consumption of alcohol and to reduce the risks to physical, mental and family health that can arise from alcohol misuse.
 - Within the next four years, 75% of the population aged 15 years and over should know and understand the recommended sensible limits for alcohol consumption.
 - Over the next ten years the proportion of those who exceed the recommended sensible limits for alcohol consumption should be reduced.

5.3 Nutrition through the Life Cycle

Special dietary advice is necessary for different groups in the population, depending on age and nutritional requirements. This section sets out guidelines for these groups.

5-3-1 Babies

Breastfeeding

During the first few months of life breastfeeding is recommended. The prevalence of breastfeeding in Ireland is very low compared to other European countries. In July 1994 a National Breastfeeding Policy for Ireland was launched (Department of Health 1994c). This report, prepared by the National Committee to Promote Breastfeeding, made several recommendations. These aim "...to increase the percentage of mothers in all socio-economic groups who breastfeed and to increase the number of mothers who practice exclusive breastfeeding for at least four months and thereafter with appropriate weaning foods".

Specific targets for breastfeeding were set:

- an overall breastfeeding initiation rate of 35 per cent by 1996 and 50 per cent by the year 2000;
- a breastfeeding initiation rate of 20 per cent among lower socio-economic groups by 1996 and 30 per cent by the year 2000;
- a breastfeeding rate of 30 per cent at four months by the year 2000. At present it is estimated that 11% of mothers are breastfeeding at three months (Department of Health 1995b).

Bottle Feeding

No artificial infant milk formula can confer the same anti-infection properties as breastmilk. However, mothers who do not wish to breastfeed or those who are changing from breast to bottle should choose the most appropriate infant milk formula feed. Details of the different formulae on the market are included in "Food and Babies" - a guide for feeding babies up to one year of age, available from the Health Promotion Unit (Department of Health 1995c).

Follow-on Milks

The type of milk given to babies from the age of six months up until one year needs careful consideration.

Cow's or goat's milk is totally unsuitable for this age group. "Follow-on milks" are fortified with vitamin D and iron and may have a role in the diet as an alternative to cow's milk. However, it is recommended that breastmilk or an infant milk formula should be used up to one year of age. The composition of infant formulae are subject to regulation (Minister for Health 1994).

Weaning

It is recommended that breast or bottle feeding should continue on demand until four to six months of age. Weaning on to appropriate foods then commences which will help to maintain the baby's iron stores. The length of time during which the baby is weaned on to solid foods varies. "Food and Babies", the guide for mothers on feeding their baby (see above), also contains information on weaning.

5.3.2 Infants and Toddlers

Babies gain about 6 kg (15 lbs) in the first year of life. In the second, third and

fourth years they gain on average 2 kg (5 lbs) per year. After weaning, infants and toddlers can participate in family mealtimes and this will introduce them to a wide range of foods. They can be quite conservative in their food preferences and may take sudden dislikes to foods. Parents need not be unduly worried about transient food fads.

Milk

Milk contributes a large proportion of nutrients and energy to the baby's diet. Whole cow's milk when used as a replacement for breastmilk or infant milk formula is totally unsuitable for babies up to one year of age. This is mainly due to the composition of whole cow's milk. Low fat milk is not recommended for children under two years of age. It is unlikely that the use of low fat milk in healthy two to five year old children consuming a diet adequate in nutrients and energy will cause any detrimental effects. Children who should not take low fat milk include those on special diets, children who are failing to thrive and children on vegetarian diets or any other dietary restriction. Skimmed milk is unsuitable for children under five years of age.

Guideline 5.6

All mothers should be encouraged to breastfeed. The recommendations of the National Committee to Promote Breastfeeding should be implemented.

Infant milk formula may be used as an alternative to breast milk or when changing from breast to bottle feeding. Breastfeeding or infant milk formula feeds should be used up to the age of one year.

Weaning onto solid foods should start between the ages of four and six months.

Cow's or goat's milk is not recommended for infants under the age of one year. Low fat milk is not recommended for children under two years of age. Skimmed milk is not recommended for children under five years of age.

5.3.3 Schoolchildren

Little research has been done in Ireland on the overall diet of this age group and most available information deals with breakfast and lunch. Lifestyles are changing and in many households regular family meals are less common than in the past. Regular mealtimes are advised to ensure an adequate intake of energy and nutrients. Smaller meals or snacks of starchy foods, milk or fruit juice may also be necessary. Frequent consumption throughout the day of foods containing sugar can contribute to the development of dental caries in schoolchildren and should be avoided.

Schoolchildren should follow the guidelines for the general population, taking into account specific considerations for this age group. The food intake of schoolchildren should not be limited unnecessarily. Children need energy and nutrients to fulfil growth needs and requirements for everyday activities. To ensure that a child grows and develops to his/her maximum potential, an

adequate intake of all foods in a balanced way, with plenty of exercise, is recommended. Usually, children do not need any vitamin supplements unless there is a medical reason for their use.

School Lunch Schemes

Schemes for children in deprived areas include the provision of a school lunch consisting of sandwiches and buns. There are two such schemes in operation, one in urban areas and the other in Gaeltacht areas. The EU milk scheme is also available free to all schoolchildren in Dublin Corporation areas and at a nominal charge in other schools. However, only a minority of schoolchildren in participating schools avail of this scheme.

In 1993, the Departments of Health and Education undertook a joint initiative to highlight the nutritional importance of the school lunch. Each school was encouraged to adopt a policy to promote the consumption of healthy school lunches, as appropriate to their pupils.

Guideline 4.7

A balanced intake of all foods in the appropriate amounts should ensure the optimal development of a child.

Healthy eating in schools should be incorporated into the overall school policy and curriculum. A consistent health message should be given in the classroom and reinforced by the provision of healthy food choices in the tuck shop and canteen.

It is recommended that schoolchildren should avoid the frequent consumption throughout the day of foods containing sugar, as this contributes to the development of dental caries. Good oral hygiene practices including the use of fluoride toothpaste at least twice a day should be taught within the school setting and at home.

5.3.4 Adolescents

This is a period of very rapid growth and sufficient energy and nutrients are needed to fulfil these extra requirements. At this time young people are becoming more independent and because of their activities may not be present for family meals, especially lunch and dinner. Main meals may need to be supplemented with smaller meals of starchy foods, milk or fruit juice to meet the increased energy requirements of this group.

The Irish National Nutrition Survey showed that 2% of girls did not eat meat (Irish Nutrition and Dietetic Institute 1990). In a smaller survey of Irish schoolchildren 3% of boys and 6% of girls claimed not to eat red meat¹ for various reasons (Cunningham 1993). Education of this group is important. If valuable sources of nutrients such as meat, chicken, fish or milk-based foods are excluded from the diet, advice is needed about alternative sources of protein, iron, calcium and vitamin B12 (see section 3.4.1 and 3.4.2).

¹ Red meat includes beef, lamb/mutton and pork.

Exercise

A pattern of regular physical activity should be established in boys and girls during the teenage years. There is a substantial decrease in the amount of regular exercise taken during these years, particularly by girls. This difference in exercise levels between males and females continues into adulthood.

5.3.4.1 Adolescent Girls and Young Women

Eating Patterns in Girls

The Irish National Nutrition Survey showed that girls had lower energy intakes than boys of the same age. Other studies found significantly lower energy intakes in women than in men, even in sportswomen who require large amounts of energy. Young girls are particularly conscious of their body image. The practice of dieting has been identified among schoolgirls; they tend to cut back on the amount of bread and potatoes eaten to lose weight. Reduced energy intake can result in a poor nutrient intake. The focus on the restriction of food intake may be a factor in the development of illnesses such as anorexia nervosa and bulimia nervosa. It is important for girls to eat plenty of staple foods including cereals, bread, potatoes, fruit and vegetables.

Iron

In the Irish National Nutrition Survey 75% of females between the ages of 12 and 59 years had an iron intake below the recommended dietary allowance for that group. Adolescent girls have a particular need for iron due to weight gain and the onset of menstruation. An adequate intake of vitamin C is needed for the efficient absorption of iron in the diet (Section 3.4.1.1 and 3.4.2).

Calcium

From childhood until about 18 years of age, bone develops in size, strength and mineral content. The Irish National Nutrition Survey found that girls from the ages of 12 to 17 years had a calcium intake lower than the recommended dietary allowance for that group. It is recommended that a positive calcium balance should be maintained during adolescence (Section 3.4.2). Exercise can help to develop bone strength and should be encouraged. Adequate calcium intake is also required in young women as bone continues to develop into the third and fourth decade of life. Adequate calcium intake and regular physical activity in young women contribute to the prevention of osteoporosis in later life.

Folate

Folate deficiency has an effect on rapidly regenerating tissues. This is especially important in babies and young children and supplementation of at-risk mothers during pregnancy can protect against the development of neural tube defects in the developing foetus. All women of childbearing age, including post-primary school pupils and early school leavers, should be aware of the importance of folate in the diet (Section 3.4.1.1).

Guideline 5.8

An eating pattern similar to that recommended for the general population should be encouraged in adolescent girls and young women, with a varied intake of food and regular physical exercise.

Inappropriate and faddy "dieting" should be strongly discouraged.

Special attention should be paid to calcium, iron and folic acid intakes in this group.

5.3.4.2 Adolescent Boys and Young Men

Adolescent Boys

Physiological changes which occur in boys include a doubling of red blood cell mass and increased haemoglobin concentration. When growth rate is at its highest from ages 14 to 18 years, total body iron increases by up to 25% per annum. This is also a critical phase for the development of peak bone mass. As in girls, a positive calcium balance is recommended for boys at this time.

Adolescent boys have a very high energy intake (Irish Nutrition and Dietetic Institute 1990) and as a result have an adequate intake of all nutrients. Compared to girls, boys consume more foods which are high in fat and sugar. A higher percentage of boys than girls participate in regular physical exercise.

Young Men

Young men participate in physical activity at leisure to a greater extent than women; these differences are particularly marked in the lower socio-economic groups. They have a large food intake and have no specific nutritional deficiencies. Some research has shown that fruit and vegetable intake is lower in young men than in young women. The development of obesity in young men can have serious consequences for health later in life. With increasing obesity there is a higher risk of developing cardiovascular disease, diabetes mellitus, some cancers and other chronic diseases.

Guideline 5.9

A high energy intake is needed in adolescent boys engaged in regular training and exercise. This high energy intake may require an increased meal frequency but should not be associated with frequent consumption throughout the day of foods containing sugar.

Young men should follow the general dietary guidelines for the population with special emphasis on increasing their consumption of fruit and vegetables.

5-3-5 Nutrition Before and During Pregnancy

Nutrition prior to pregnancy

Research has highlighted the importance of the nutritional status of the mother prior to and during the initial months of pregnancy (Institute of Medicine 1990). Ideally a woman should enter pregnancy in a nutritionally prepared state. Factors such as body weight, folate intake, iron status, energy intake and vitamin and mineral intakes are important. Education on smoking and on alcohol consumption is also needed at this time.

Pregnancy - Initial Stages

The initial three months of gestation are the most important for the developing foetus. During this time there is a rapid increase in the number of cells and development of the organ systems occurs. Dietary requirements at this stage are supplied by a varied diet, following the general guidelines for healthy eating, unless a specific nutritional problem is evident. Special attention to folate intake is needed at this stage of pregnancy (section 3.4.1.1).

Later Stages of Pregnancy

After the third month, there is a rapid weight gain by the foetus (500 fold) until birth. During pregnancy there is a small increase in energy requirements of approximately 300 kcal per day. This varies widely depending on factors such as changes in metabolism and decreased activity levels. Recommended weight gain depends on the woman's weight before pregnancy (Institute of Medicine 1990). Adherence to weight reduction diets during pregnancy is not advised and any weight problems should be tackled at a later stage.

An additional 6g per day of protein is recommended during the second half of pregnancy to ensure normal foetal growth and development. This brings the recommended dietary allowance up to 60g per day. The majority of the population eat sufficient protein and it may therefore not be necessary to specifically increase protein intake during pregnancy.

Adequate intakes of vitamin D and calcium are needed to ensure the optimal development of the baby's skeleton. Vitamin D requirements increase from 7.5 ug to 10 ug daily during pregnancy (section 3.4.1.2). In Ireland, the recommendation is to increase calcium intake by 400 mg per day, from 800 to 1,200 mg/day, during the second half of pregnancy (section 3.4.2). Women who have a low calcium intake and pregnant adolescents require calcium supplementation during pregnancy. Excessive intake of phytates (found in wholegrain and wholemeal cereal foods) should be discouraged as they interfere with calcium absorption. However, an adequate dietary fibre intake and plenty of fluids are needed to prevent constipation.

Estimated iron requirements during pregnancy vary from 550 mg to 680 mg per day (section 3.4.2). The extra need for iron is offset partly by cessation of menstruation (200 mg daily) and partly by a progressive increase in iron absorption throughout pregnancy.

The status of the mother's iron stores before pregnancy can influence the subsequent development of iron deficiency anaemia. Due to the difficulty in identifying those at risk from anaemia, iron supplementation is often prescribed. As with other medications in pregnancy, women should follow the advice given to them personally in relation to iron supplementation.

Guideline 5.10

- Good nutritional status is desirable prior to pregnancy.
- An adequate diet with regular meals is needed during pregnancy. Special consideration should be given to energy, protein, folate, calcium, vitamin D and iron intakes at this time.

After Delivery

The diet should contain an adequate intake of energy and nutrients. A realistic expectation of weight loss should be emphasised to the mother and a gradual increase in physical activity is recommended. If the mother is breastfeeding she requires an increased fluid intake. Specific recommendations are made on this subject in the Health Promotion Unit publication "Food and Babies" (Department of Health 1995c).

5.3.6 Mature Women

At this stage of life good eating patterns may already have been developed along the principles of the guidelines for the general population. If not, these general guidelines should form the basis of any change in diet.

The prevalence of post-menopausal osteoporosis is high in Ireland. This may be linked to a poor calcium intake combined with insufficient physical activity in younger women. Older women appear to have an adequate calcium intake from dietary sources.

There is evidence of an increase in the prevalence of overweight and obesity with increasing age in Irish women. This is likely to increase risk of raised blood pressure and diabetes mellitus and lead to problems with mobility and osteoarthritis.

There is concern regarding the risk of breast cancer in women. The association between diet and cancer is the subject of research internationally. A high consumption of fruit and vegetables appears to be protective and to reduce the risk of some cancers. In general, a balanced and varied eating pattern will be protective against coronary heart disease and cancer.

Guideline 5.11

The dietary recommendations for the general population are appropriate for mature women. | j

Women in middle age should pay special attention to their calcium and vitamin D intake. | j

It is recommended that this group participate in regular physical activity. | l

5.3-7 Mature Men

Middle age is a time when many people decide to change to healthier lifestyles. A lifestyle with healthy eating patterns and plenty of physical activity will reduce the incidence of chronic disease.

The general guidelines for the population apply to this group. There is evidence that men eat less fruit and vegetables than women. Alcohol consumption is substantially higher in men than in women.

Guideline c.12

The guidelines for the general population apply to this age group, with attention to the balance of fats in the diet, increased fruit and vegetable consumption, moderation in alcohol intake and increased levels of physical activity.

5.3.8 Older People

There are no population surveys available about the dietary intake of older people in Ireland. Retirement can be a time of lifestyle change for many people. The routine of work has gone and this can affect the eating pattern of the retired person and their household.

As people get older various problems may arise if they are living alone with limited mobility and have difficulty getting to shops. A lack of variety of food in the diet can result in low nutrients intakes. Poor mobility may result in vitamin D deficiency, which is dependent on exposure to sunlight, and is a particular problem for those residing in institutions. Low calcium intakes can contribute to the development of osteoporosis. Milk fortified with vitamin D and calcium is recommended for this group.

Elderly people, especially those with poor mobility, can suffer from constipation. An adequate intake of fluids as well as dietary fibre from cereals, fruit and vegetables will alleviate this problem. A fruit and vegetable intake of at least four servings per day is essential for this group as vitamin C assists the absorption of iron and the dietary fibre in these foods helps prevent constipation.

Guideline 5.13

In general, an eating pattern similar to that in earlier life is recommended. The older person should continue to remain as physically active as possible.

This group are recommended to increase fruit and vegetable intake and to ensure an adequate fluid intake.

Milk fortified with vitamin D and calcium is recommended for elderly people, particularly in the winter months.

Chapter

Influences on food choice

Six

Food Production and Processing in Ireland

6.1.1 Introduction

The Irish food industry has an annual output valued at approximately £8 billion (Department of Agriculture, Food and Forestry 1993). The percentage of the labour force involved in agriculture is high in Ireland compared to other European countries. Agriculture and food production account for 16% of employment, 15% of Gross Domestic Product (GDP), about 22% of exports and 40% of net exports, i.e. the difference between imports and exports.

Recent developments in the industry include substantial rationalisation of food processing companies. There has been a move towards added-value as opposed to first stage processing, considerable growth in the range of manufactured food products and an increased emphasis on quality and marketing. The future development of the food industry will be strongly influenced by trends in international markets.

The food processing industry plays a substantial role in providing healthy food choices and influencing dietary behaviour. Food companies have an important role to play in the provision of information to the consumer. Processors are aware of the concern among consumers regarding food additives, biotechnology procedures, packaging and the ecological results of food processing.

The Expert Group on the Food Industry (1993) pointed out that market and consumer developments form an important backdrop against which policy must be framed. The Expert Group recommended that farming and food processing representatives be closely involved in the formulation and implementation of food and nutrition policy.

Recommendations about food production from a nutritional perspective must be considered within the context in which the Irish food industry operates. In addition to local conditions such as climate, land and soil, the food industry is affected by national, European and international economic and trade factors.

6.1.2 Impact of the Single Market

The Single Market of the EU will increase the power of multinational food companies and the need for large scale production. As a result of this, the main determinants of success for Irish companies in Europe will be efficiency, quality and new product development.

6.1.3 The Effect of Common Agricultural Policy (CAP) Reform

The price and market support policy under the CAP, particularly intervention purchasing, led to an over-emphasis on commodity production. Under the CAP reform the medium to long-term strategy will be to encourage continued movement towards the manufacture of products demanded by the market.

6.1.4 The Uruguay Round of GATT Negotiations

The recent GATT (now the World Trade Organisation) agreement is likely to result in an increase in competition. This will occur from, for example, increased imports into the EU. Export potential will also be affected by the reduction in export subsidies and the imposition of import quotas in other regions. There will be a greater emphasis on international regulations. The

importance of international standards will increase, influencing food quality.

6.2 Food Safety and Hygiene

6.2.1 Monitoring and Surveillance

Potentially serious risks arise from foodborne disease caused by contamination of food or drink by pathogenic micro-organisms or their toxins. The incidence of foodborne disease is increasing in the developed world.

The increased risk and frequency of foodborne infections and intoxication can be attributed to several factors, including intensive farming methods, the mass production and processing of food of animal origin and with an increase in international trade in food and animal feed. Also, the large-scale migration of people, for example, tourists and those who travel for work and business purposes, has contributed to the spread of human enteric pathogens.

In Ireland, there are procedures in place to monitor possible hazards. Pesticides are monitored under the surveillance programme carried out by the Department of Agriculture, Food and Forestry Pesticide Control Unit. The use of additives in food manufacture is controlled by regulations. Inspection systems operating under the aegis of the Departments of Health and Agriculture, Food and Forestry together with education and training of food operatives, aim to produce food which conforms to the highest international standards.

The Food Safety Advisory Committee have submitted several reports on aspects of food safety to the Ministers for Health and Agriculture, Food and Forestry (Appendix 3).

6.2.2 The Regulatory Arrangements

All premises engaged in the production, processing, preparation or retailing of food in Ireland are subject to official regulatory control. They must be registered with the Department of Agriculture, Food and Forestry or with the health boards, as appropriate. Annual licensing of certain types of food stalls by health boards is also provided for. Increasingly, Irish regulations are based on E.U. Directives and Regulations.

In general terms, the Minister for Agriculture, Food and Forestry has responsibility for premises engaged in the production and primary processing of milk, milk products and meat products (beef, pigmeat, poultry (including eggs), sheepmeat, game). The responsibilities of the Minister for Health, under the Food Hygiene Regulations implemented by the eight regional health boards, extend to all other food production premises and stages (Lyons 1981). The Minister for Health also has responsibility for those engaged in the preparation for final consumption and/or retailing of all foods, including those which in the first stages are controlled by the Department of Agriculture, Food and Forestry.

The inspection, sampling and analysis operations carried out by both Departments are backed-up by extensive laboratory systems, including the Public Analyst Laboratories, food microbiology laboratories, veterinary and cereals research laboratories.

The various regulations provide enforcement procedures and penalties for non-compliance, including closure orders. In 1994, the establishment of a national food surveillance programme was recommended (Food Safety

Advisory Committee 1994a). The national health strategy contains a commitment to set up a national surveillance programme for the control of foodborne infections (Department of Health 1994a). The monitoring of food safety and foodborne infections are among the terms of reference of the newly established Food Safety Advisory Board (see section 2.8).

6.2.3 The Food Hygiene Regulations

Good hygiene is a basic element of food safety and an important preventive public health measure. Consumers nowadays demand that high standards and stringent controls operate throughout the food chain from production to consumption. The food hygiene regulations play an important role in this regard. They set out the statutory requirements in relation to food hygiene and food premises and are important in ensuring the maintenance of standards throughout the food industry. They prohibit the sale for human consumption of food which is diseased, contaminated or otherwise unfit for human consumption. The regulations require that adequate precautions be taken to prevent the contamination of food intended for human consumption at all stages of importation, manufacture and distribution. This includes the maintenance of hygienic conditions in food premises and observance of specific hygienic precautions by food handlers. The regulations also provide for the seizure of unfit food and for its destruction.

6.3 Food Fortification

Some foods are fortified; for example, calcium is sometimes added to flour used for commercial bread baking, and one Irish flour mill adds iron, thiamin and niacin to retail flour. Table margarines have added fat soluble vitamins. Some milks and breakfast cereals are fortified with micronutrients. Foods are fortified for the following reasons (Food Safety Advisory Committee 1994b):

- Restoration of micronutrient levels due to their loss in processing;
- Establishing levels equal to comparable products;
- Public health issues; and
- Marketing reasons.

There is limited legislation regarding the fortification of foodstuffs in Ireland. The Food Safety Advisory Committee recommended that "...developments in food fortification should be carefully monitored".

6.4 Food Labelling

A food label should help to inform and educate the consumer regarding nutritional choice. Information should be presented in a format which is easily understood by the consumer and in compliance with Irish legislation and EU Directives. Food labelling Directives cover ingredient listing, nutrition labelling, 'best before'/'use by' dates and claims.

6.4.1 Labelling and its Uses

In a survey of 1,400 Irish adults on attitudes to diet and health, less than 1% volunteered food labelling as either the most important or second most important source of nutrition information (Kearney, Gibney 1992). Research shows that consumers have difficulty in understanding numerical expressions

and cannot easily use the nutrient information presented in order to make food choices (Black, Raynor 1992). Some shoppers use labels for product comparison (Conroy et al 1994). Consumers may use nutritional claims for information more often than ingredient labels and nutrition labels (Mahon, Gibney 1995). Overall, studies on the use of food labels show that, although consumers want comprehensive nutritional information, their understanding of the information is limited (Earl et al 1990).

6.4.2 Food and Nutrition Labelling in Ireland

Council Directive 79/112/EEC lays down requirements for the labelling of foodstuffs. It is implemented in Ireland by the Department of Enterprise and Employment. The Office of the Director of Consumer Affairs has issued a publication, "Guidelines for Food Labelling" to explain the EU Directives to food manufacturers and retailers. A publication on food and nutrition labelling aimed at the general public has also been produced by the Office of the Director of Consumer Affairs in conjunction with the Consumers' Association of Ireland.

At present, foods which claim to provide various nutritional benefits must be labelled with additional particulars to support this claim. Foods which claim to fulfil a particular nutritional use must also be labelled appropriately.

Council Directive 90/496/EEC, implemented by the Department of Health, facilitates a gradual phasing in of nutritional labelling regulations. It states that nutritional labelling is voluntary. Labelling becomes compulsory, however, on any product if a nutritional claim is made. The directive lists how these details must be presented and provides technical definitions.

When nutritional labelling is provided, the information shown on the product must consist of one of two types of presentation.

1. Group One

- energy value
- the amount of protein, carbohydrate and fat

2. Group Two

- energy value
- the amount of protein, carbohydrate, sugars, fat, saturates, fibre and sodium.

If nutritional claims are made, the Directive specifies the nutrient information which must be provided.

The European Union have reached agreement on proposed amendments to the food labelling legislation (Council 1995). When enacted, it will be necessary to provide quantitative ingredient listing, i.e. the quantities of ingredients must be indicated, but only for those ingredients which are 'mentioned, emphasised or characteristic'.

6.5 Food Retailing

In recent decades there has been an important change in the type and distribution of retail outlets around Ireland, with the grocery trade being dominated by supermarkets. In 1993, it was estimated that 5% of retail outlets accounted for 60% of total business (National Nutrition Surveillance Centre

1993). There has been an increase in the range and availability of foods in supermarkets in recent years.

Many Irish households now rely on a once weekly shopping trip to the supermarket. The attractions of the supermarket for the consumer are price, convenience, availability and variety. However, there may be a difference in the range, variety and price of goods available in different branches of the supermarket chain depending on the socio-economic groups they serve (Dineen et al 1992).

The link between the consumer and the retailer is vital as it provides potential for feedback from the consumer. Irish consumers perceived retailers to be an accurate source of nutrition information (Downey 1987). Some retail outlets now employ nutrition and food advisors to provide information to consumers.

6.6 The Consumer

Consumers' attitudes toward food quality are changing and now include ethical, environmental and animal welfare considerations. Consumers expect their food to meet quality standards and to be of the variety, content, composition, nutritional value, taste, freshness and appearance they want.

Access to a secure supply of staple foods is fundamental. In this context, the price of food is important to consumers. It affects their ability to exercise choice in the marketplace. This is especially so when food represents a high percentage of expenditure, as is the case for low income families.

Consumers want to be confident that the food they eat is safe. Relevant issues include the use of additives, veterinary drug residues, pesticide residues and the incidence of microbiological contamination.

In order to make informed choices about their purchases and diet, consumers need clear, consistent and reliable information. This helps them to make valid comparisons when deciding about quality and value (including nutritional value) for money.

In conclusion, consumers should have access to a wide choice of foods, including fresh food. They should be in a position to follow dietary and nutrition advice and low income should not be a barrier to having a safe and healthy diet.

6.7 Catering

Caterers are responsible for the provision of food outside the home. Techniques such as ingredient manipulation, food selection, cooking and marketing methods should all be used to provide the consumer with healthy food choices. The guidelines in the Irish Heart Foundation Happy Heart at Work and Happy Heart Eat Out Programmes (carried out in association with the Health Promotion Unit and the Voluntary Health Insurance Board) are useful resources for the implementation of healthy eating guidelines in catering facilities. Institutional catering is often run from a fixed budget allocated by an administrator. This may make it difficult for caterers to make changes to the menu. However, there are now several examples of excellence in the provision of healthy food choices to customers in workplaces, hospitals etc.

6.8 Socio-Cultural Context

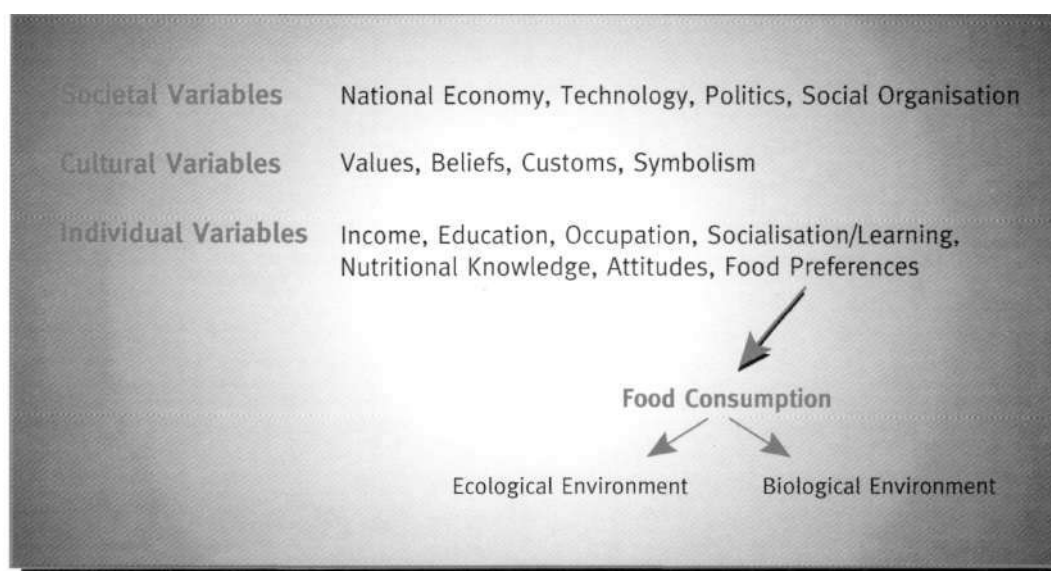
The factors which influence food choice are shown in Figure 6.1 (Parraga 1990). These include societal and cultural influences as well as environmental and biological considerations. Food intake is affected by individual variables such as age, income, lifestyle, food preferences (influenced by habit and fashions), attitudes and the time available to prepare and eat food.

6.8.1 Sociodemographic Factors

In Ireland during the 1980s there was a fall in the birth rate and in death rates in late middle age. The proportion of older consumers is projected to increase (Central Statistics Office 1988). Household composition has also changed. The fall in the birth rate is associated with a smaller size of households. There has been an increase in single-parent families. Employment trends indicate an increase in the number of households with two workers and with no workers. These demographic changes influence the pattern of consumer spending on food products.

The Irish National Nutrition Survey indicated differences in food consumption patterns between urban and rural areas (Irish Nutrition and Dietetic Institute 1990). The mean energy intake in absolute terms was higher in rural compared to urban areas for males over 18 years and females under 18 years. Milk and potato consumption were higher in the rural groups; chips and low fat milks were more widely consumed in urban areas.

Figure 6.1 Influences on Food Choice



Adapted from Parraga (1990)

6.8.2 Attitudes, Beliefs and Practices

There have been several studies on dietary knowledge, beliefs and practices of the Irish population. The common findings were that the principal perceived influences on health and longevity were good food, regular exercise and abstinence from smoking. For example, McCluskey's study (1989) found that the principal causes of physical illness were perceived by the participants to be "bad diet" and "unhealthy food". Socio-economic factors (apart from stress and worrying) were not considered to influence health.

As part of an EEC survey, a national sample of 861 adults was questioned regarding their dietary concerns (O'Neill 1988; O'Neill, Shanahan 1990, 1993). The results reflected a high level of interest in the nutrients in food as well as concern about additives, artificial colourings, preservatives and the use of growth promoters. Factors such as fat, salt and sugar were not perceived as being as important. Kearney (1994) found similar results; although 57% of the surveyed population said that a "healthy diet" was the most important or second most important factor in health, there was much consumer confusion about the implementation of dietary guidelines.

Cunningham's (1993) survey of 500 schoolchildren between the ages of 12 and 15 years found that 91% were concerned about the effects of lifestyle on health. Some were aware of the increased risk of coronary heart disease with high fat intakes. In general, this knowledge was not reflected in their dietary patterns.

Barriers to healthy eating have been described in the "Nutrition Health Promotion Framework for Action" (Department of Health 1991). These include:

- Lack of consistent information on food and health for the public and health professionals;
- Cultural aspects of eating;
- Constraints of low income;
- Attitudes about foods;
- Limited availability of healthy foods in various outlets e.g. canteens;
- Inadequate nutrition labelling; and
- Pressures from advertising of "unhealthy" food.

A study of dietary perceptions in the workplace and a third level institution revealed that, of those who wanted to change their diet, access to appropriate food choices was a barrier to achieving change (Flemming 1994). Men and women under 20 years of age had little interest in changing their diet whereas women were more interested in dietary change with increasing age. Approximately half of those sampled thought their diet did not need to be changed.

Factors which influence people to change their diets were examined in a nationally representative sample of 1,401 adults (Kearney 1994). People were asked if they had changed their diets for better, for worse or not at all in the previous three years. Just over 60% had not changed their diet and 78% of those stated that their diet was fine as it was. Those who improved their diet (32% of the total sample) stated that they did so for health awareness, medical and weight loss reasons. The study showed that the majority of consumers who perceived that they had not changed their diet were apathetic and uninterested in changing their eating patterns.

6.8.3 Low Income

Those who are most likely to be on a low income are the unemployed, single-parent families, large families, students and pensioners (Murphy-Lawless 1992). Each member of a family is affected in different ways by poverty. Women may reduce their consumption of food in order to provide more for their children (Byrne 1991). The homeless and travellers are especially vulnerable to

nutritional inadequacies.

The main problem in lower socio-economic groups is lack of variety in the diet. Some people have inadequate storage and cooking facilities. They may also lack the appropriate information and skills to prepare foods, thereby limiting food choices.

A study by Gibney and Lee (1990) of the nutritional status of a lower socio-economic group in Dublin found that dietary fat and fibre intakes were similar to the rest of the population. Dietary fibre intake was lower than the recommended dietary allowance, as were iron and vitamin C intakes in girls and women. Women in the surveyed group were at risk from nutritional inadequacies, especially in single-parent families. The Happy Heart National Survey (Irish Heart Foundation 1994) found that women in higher socio-economic groups ate more fruit and vegetables than other groups. Men and women in the lower socio-economic groups ate less chicken and fish and used more table sugar than other groups.

According to popular opinion, poor budgeting is common in low income families. However, research shows that families on low incomes are making the best use of their resources and that poor food intake is not due to poor budgeting (Cole-Hamilton, Lang 1986; Gibney and Lee 1990; Murphy-Lawless 1992). Consuming three meals a day at regular times, with some snacks where needed, may not be financially feasible for large families or individuals affected by unemployment or disability.

Diet is not the only lifestyle cause of ill health among low income groups. Factors such as stress and social circumstances can affect a person's well-being. Research shows that people in lower socio-economic groups have a higher prevalence of physical and psychological ill health than the remainder of the population which is not solely explained by their lifestyles (Nolan 1991).

6.9 Government

Almost all government departments and agencies have a role in the implementation of food and nutrition policy.

6.9.1 Government Departments

Policy development is an on-going process. Ideally, the policies and actions of different government departments pertinent to food and nutrition should strive to be consistent and compatible with public health. Examples of potential for coherent policies include the availability of healthy food choices in all institutions which are State funded. Co-ordination between government departments is also important. For example, links between the Departments of Health and Education can ensure that nutrition programmes are taught in schools and training colleges.

An agriculture policy which supports health is important to food and nutrition policy. At present Irish food enjoys a wholesome, natural and unspoiled image. Increased consumer interest in food and health will provide opportunities for market expansion and development. The production and marketing of fish, fruit and vegetables could be expanded to meet consumer demands and develop new markets for these foods.

6.9.2 Government Agencies

Activities of government agencies relevant to food and nutrition policy are described in Chapter 2, sections 2.6, 2.7 and 2.8. The newly established Food Safety Advisory Board has a remit which encompasses food safety and nutrition and will provide a framework for consultation and review of food and nutrition policy. Government agencies concerned with food such as An Bord Bia (The Irish Food Board), Teagasc (The Agriculture and Food Development Authority) and Forbairt (which has responsibility for the development of Irish industry) have an important role to play in the promotion of healthy Irish foods, both on the home market and abroad. Surveillance and monitoring are an integral component of policy development and review. The Nutrition Surveillance Centre in University College, Galway has an important role to play in the surveillance, monitoring and dissemination of information.

Chapter

The Recommendations of the
Nutrition Advisory Group on a Food and
Nutrition Policy for Ireland

Seven

It is important that the Irish Government should approach the subject of food and health with the benefit of a national position. This should be the result of an inclusive exercise in national policy formulation and should be reflected in all areas of government in its approach to the subject, both at home and abroad.

It is in this context and against this background that the Nutrition Advisory Group makes the following key recommendations for a national food and nutrition policy for Ireland. The main purpose of our recommendations is to promote health through the provision of a safe and nutritious food supply to all of the population. The Nutrition Advisory Group considers that adoption of this report would represent a recognition that a food and nutrition policy is required in order to achieve health gain through nutrition.

Chapter 5 of this report sets out dietary guidelines for the general population and for different age, sex and social groups. In this chapter (Chapter 7) the Group sets out recommendations on the strategies necessary to attain these dietary guidelines.

Government Policies

7.1.1

The health of its people is one of the most important resources of any country. An improvement in dietary patterns in Ireland should be a priority and will, with other lifestyle changes, materially improve the health of the nation. Given the evidence to support the role of diet in health, the Government must take a leadership role in co-ordinating action to improve the nutrition status of our people.

7.1.2

Policy development and implementation will require the long-term, on-going and sustained commitment of government. All government departments should be required to take health considerations into account when deciding on policies which influence food production and consumption. Positive and co-ordinated action by government departments would be facilitated by the development of a strategic plan, with input from all relevant departments.

7.1.3

It is considered a priority that formal structures should be established for communication between government departments on matters relevant to food and nutrition. Officials at the most senior level from all government departments, including Finance, should meet regularly to review progress and agree plans for the future.

7.1.4

More detailed investigation will be required to develop and implement policies and strategic plans for vulnerable groups, such as infants and those on low incomes.

7.1.5

Consumers at home and in our export markets have an increasing interest in nutrition and health. Irish producers should be encouraged to develop and

maintain a national brand image of food which is tasty, safe and of high quality, produced in a pollution-free environment and consistent with nutritional requirements for health.

7.1.6

Food production is heavily influenced by factors such as climate and soil type as well as by international commitments, for example, to the World Trade Organisation (WTO, formerly GATT). Within the opportunities, challenges and constraints of these factors, the Government should encourage and support initiatives to broaden the range of foods produced in Ireland. Research should be encouraged into the production of those types of food where there is evidence of health promoting properties, for example certain types of fruits and vegetables, and into import substitutes for sources of unsaturated fats and complex carbohydrates.

7.1.7

The activities of state promotional agencies should support the attainment of the objectives of the national food and nutrition policy.

Implementation of Policy

7.2.1

One organisation should be responsible for the implementation and co-ordination of food and nutrition policy measures; this organisation should facilitate communication between government departments, advisory bodies, consumers, those undertaking relevant research and surveillance, food producers, processors, retailers and caterers, educators and health professionals.

7.2.2

Policy development and implementation should be supported by technical experts to examine nutrition and health issues in an Irish context.

7.2.3

Given that State policy is shaped in part through the representations of different and sometimes conflicting interests, mechanisms for consultation should be established where account can be taken of the interests of consumers, scientists, the agri-food industry and regulatory authorities.

7.2.4

A Food and Nutrition Information Centre should be established with responsibility for dissemination of nutrition information to the public (see 7.2.6 and 7.6.1).

7.2.5

The national co-ordinating agency should have responsibility for the development and co-ordination of national nutrition health promotion programmes. Such programmes should be multi-sectoral and should take into account the findings of research on attitudes to healthy eating and into

perceived barriers to making healthy food choices (see 7.3.3 and 7.3.5).

7.2.6

Functions such as the dissemination of information and the implementation of nutrition health promotion programmes may be devolved to the Health Promotion Unit of the Department of Health which is already active in these areas.

7.3 Research

7.3.1

In order to track progress towards the attainment of the dietary guidelines, it is essential that research be carried out on the food and nutrient intake of Irish people. It is recommended that national food consumption surveys should be of sufficient detail to estimate food and nutrient intake and to facilitate the monitoring of food safety. These should be carried out every five years. The potential for collaboration with similar research in Northern Ireland should be investigated.

7.3.2

When information is available on the diet of the population, quantitative nutrient guidelines should be developed. All those involved in policy implementation could then judge the extent to which existing dietary practices differ from those which are recommended. Subsequent surveys would monitor the rate at which these nutrition targets were being attained.

7.3.3

To facilitate the development of nutrition health promotion programmes, research should be available on purchasing trends and on factors which influence food choices. The factors which support behaviour change towards healthier food choices should also be investigated.

7.3.4

Food-based dietary guidelines for the general population and for population sub-groups should be developed in a consultative framework (see 7.2.3).

7-3-5

Research should be undertaken into the nutrition-related health problems of those identified as being in 'health development sectors' as set out in the national health strategy (Department of Health 1994a). Methods to promote healthy eating among at-risk groups should be further investigated.

7-3-6

Pilot programmes should be undertaken and evaluated to increase the percentage of newborn babies being breastfed and the duration of breastfeeding in accordance with the recommendations of the National Committee to Promote Breastfeeding and to achieve the targets set in the national health strategy (Department of Health 1994c, 1994a). Research should also investigate methods of improving infant feeding practices.

7-3.7

The Nutrition Advisory Group welcomes the undertaking in the national health strategy to continue to support the National Nutrition Surveillance Centre in the Department of Health Promotion in University College, Galway.

7.4 Food Safety and Hygiene

7.4.1

Since the publication of the health strategy document, a Food Unit has been set up within the Department of Health and a Food Safety Advisory Board has been established (Department of Health 1994a; Minister for Health 1995). The location of the Food Unit and the Food Safety Advisory Board within the overall structures for the implementation and evaluation of policy should be such as to facilitate communication between all the relevant organisations (see 7.1.3 and 7.2.3).

7.4.2

Surveillance of foodborne diseases should be a priority for the newly established Food Safety Advisory Board.

7.4.3

A database should be established and made accessible to the food industry, research organisations and consumer interest groups. It should contain information on national, European Union and international regulations and directives about all aspects of food standards, microbiological and toxicological limits, food fortification and labelling.

7.4.4

The Nutrition Advisory Group endorses the recommendation of the Food Safety Advisory Committee (1994b) that "... the developments in food fortification should be monitored".

7.5 Healthy Food Choices

7.5.1

Discussions should take place with the agri-food industry to increase the range of healthy food choices produced in Ireland.

7.5.2

Food processors should be encouraged and supported to take health considerations into account when deciding on the ingredients and methods of preparation of pre-prepared foods.

7.5.3

Food retailers should seek to increase the range of healthy food choices available to consumers. Retailers should take a proactive approach to the provision of accurate nutrition information to consumers.

7.5-4

It must be recognised that there are problems of access to healthy food choices, for example to fish and to fresh fruit and vegetables in rural areas, which will require innovative solutions.

7.5-5

Restaurants in State-funded organisations should provide healthy food choices on menus. Minimum standards should be established, included in catering contracts and assessed by catering audits.

7.5-6

As part of health and safety programmes within industry, workplace restaurants should be encouraged to provide healthy food choices.

7.5-7

The catering sector should be provided with information, training and incentives, such as award schemes, to increase the range of healthy food choices on offer.

7.6 Information

7.6.1

A proactive approach should be taken to the dissemination of nutrition information to the public (see 7.2.4).

7.6.2

Media campaigns and education programmes for consumers should be developed to increase knowledge and skills in the use of nutrition labels on foods and in food preparation (see 7.3.3).

7.6-3

A code of practice should be developed for those advertising food products, especially where children are the target audience.

~/.-] The Education Services

7.7.1

All educational establishments should formulate and implement a nutrition policy and review it regularly (see 7.5.5).

7.7.2

School 'tuck shops' should offer starchy foods, fruit, fruit juices and other healthy food choices. Where in-school catering is provided, a range of food should be on offer.

7-7.3

School policies should address the maintenance of dental health through discouraging frequent consumption of sugar-containing snacks throughout the day and through providing facilities for pupils to brush their teeth after lunch.

7-7A

Nutrition education should be provided to children throughout their schooling as part of a comprehensive health education programme. Appropriate professional and in-service training should be provided for teachers.

7.7.5

School policies and education programmes should be developed in consultation with parents and carers. Information should be provided for parents before the pupils receive their nutrition education classes.

7.7.6

Schools should offer regular physical education activities in primary and post-primary schools. Special attention should be paid to innovative physical education programmes for older pupils.

7-7-7

VECs (Vocational Education Committees) and voluntary and community agencies should be encouraged and supported to provide classes on healthy eating as part of their adult education programmes.

7.8 The Health and Social Services

7.8.1

The national health strategy seeks to reorient the health services towards more effective promotion of health and prevention of disease, with potential for health and social gain being taken into account when decisions are made about resource allocation (Department of Health 1994a). As part of this process, information about healthy eating and about nutrition-related diseases should be provided to health service managers.

7.8.2

Health service institutions should act as models of good practice in the provision of healthy food choices to staff.

7.8.3

Undergraduate and in-service training programmes in nutrition should be developed for health professionals.

7.8.4

The surveillance and evaluation role of the Departments of Public Health in the health boards will be important in the development of nutrition services locally (see 7.8.5). To maximise their effectiveness such activities should be co-ordinated at national level (see 7.2.5).

7.8.5

Community nutrition and dietetic services should be provided throughout the country. Such services are vital to the implementation and co-ordination of food and nutrition policy measures at local level. These services are an essential educational and information resource for other health professionals as well as for the implementation of nutrition education programmes.

7.8.6

The provision of clinical nutrition services in association with general practitioners should continue to be developed, with appropriate arrangements for interaction with the community health services.

7.8.7

A comprehensive clinical nutrition service should be provided in all hospitals and nursing homes, with appropriate continuity of care by community services.

7.8.8

Nutrition health promotion programmes should be implemented in ante-natal clinics, day centres for the elderly and incorporated into other health services as appropriate.

7.8.9

The Nutrition Advisory Group welcomes the undertaking in the national health strategy to extend to other areas the community-based initiative on nutrition for lower socio-economic groups which was carried out on a pilot basis by the Eastern Health Board.

7.8.10

Welfare agencies should carry out pilot projects with families on low incomes to enable them to provide sufficient and varied food to meet all their nutritional requirements.

7.9 Monitoring and Evaluation

7.9.1

As part of the overall structure for the implementation of the national food and nutrition policy (see 7.2.1), structures should be put in place to monitor progress, to evaluate the process of implementation and to assess outcome in relation to improved eating habits and reduced morbidity and mortality from nutrition-related diseases.

7-9-2

The national food and nutrition policy should be regularly reviewed in the light of changes in food production, in eating habits and in lifestyles (see 7.3.7). Thus, the structures established to evaluate the implementation of policy should assess targets and strategies, so that policies and programmes remain relevant and effective in promoting optimum levels of health from a nutrition perspective in our population.

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Appendix 1

Submissions Received by the Nutrition Advisory Group.

1. National Vocational Group of Catering Officers and Assistants
2. Irish Dental Health Foundation
3. Irish Association of Health Stores
4. Weight Watchers Ireland
5. Consumers' Association of Ireland
6. Mr. Timothy Carey
7. National Bakery School of Ireland
8. Ms. Mary J. Flynn
9. Flora Information Services, W & C McDonnell Ltd
10. Ms. Kathleen Walker
11. The Irish Organic Farmers & Growers Association
12. Teagasc, Agriculture and Food Development Authority
13. La Leche League of Ireland
14. Department of Social Welfare
15. Midland Health Board
16. Irish Sugar plc
17. National Dairy Council
18. CBF (Irish Lifestock and Meat Board)
19. The Olive Oil Information Bureau
20. An Bord Glas
21. Faculty of Public Health Medicine of The Royal College of Physicians of Ireland
22. Avonmore Foods plc
23. Western Health Board
24. Mid-Western Health Board
25. Eastern Health Board
26. North Western Health Board
27. Combat Poverty Agency

28. Irish Nutrition and Dietetic Institute
29. Paediatric Interest Group of the Irish Nutrition and Dietetic Institute
30. Irish Creamery and Milk Suppliers Association
31. Association of Lactation Consultants in Ireland
32. Ms. Majella O'Shea, National Council for Curriculum and Assessment

Appendix 2

Table of Recommended Dietary Allowances

	Age Ranges (years)	Reference Weight		Reference Height		Energy		Protein*	Thiamin	Riboflavin	Niacin	Ascorbic	B ₁₂	Folate	Pyrid- [†]	Vit. A	Vit. D	Vit. E [†]	Calcium	Iron	Zinc	
		Kg	Lb	Cm	In	MJ	kcal	g	mg	mg	mg	mg	µg	µg	µg	µg	µg	mg	mg	mg	mg	
Children	Infants	Less than 1 Year	9	20	71	28	0.48- 0.44 xkg	115- 105 xkg	28-25 xkg	0.3	0.4	5	35	1.5	50	0.6	450	10	4	540	7	5
	Children	1-3	13	29	90	35	5.6	1300	33	0.5	0.7	8	45	2.0	100	0.9	300	10	5	800	8	10
		4-6	20	44	112	44	7.0	1700	43	0.7	0.9	10	45	2.5	200	1.3	300	10	6	800	9	10
7-10		28	62	132	52	8.5	2000	51	0.8	1.1	12	45	3.0	200	1.6	480	10	7	800	10	10	
Adolescents	Male Adolescents	11-14	45	99	157	62	11	2600	66	1.1	1.4	16	50	3.0	300	1.8	725	10	8	1200	13	15
		15-18	66	145	176	69	12	2900	72	1.2	1.7	19	60	3.0	300	2.0	750	10	10	1200	14	15
	Female Adolescents	11-14	46	101	157	62	9	2100	53	0.9	1.4	16	50	3.0	300	1.8	725	10	8	1200	14	15
		15-18	55	120	163	64	9	2100	53	0.9	1.7	19	60	3.0	300	2.0	750	10	8	1200	14	15
Men	Sedentary Moderately Active Very Active	19-34	70	154	178	70	10.5	2500	63	1.0	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
			70	154	178	70	12	2900	72	1.2	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
			70	154	178	70	14	3300	84	1.3	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
	Sedentary Moderately Active Very Active	35-64	70	154	178	70	10	2400	60	1.0	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
			70	154	178	70	11.5	2700	69	1.1	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
			70	154	178	70	14	3300	84	1.3	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
	Moderatley Active	65-74	70	154	178	70	10	2400	60	1.0	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
		75+	70	154	178	70	9	2100	54	0.9	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
Women	Most Occupations Very Active	19-54	55	120	163	64	9	2100	54	0.9	1.3	15	60	3.0	300	2.0	750	7.5	8	800	14	15
			55	120	163	64	10.5	2500	62	1.0	1.3	15	60	3.0	300	2.0	750	7.5	8	800	14	15
	Moderatley Active	55-74	55	120	163	64	8	1900	47	0.8	1.3	15	60	3.0	300	2.0	750	7.5	8	800	9	15
		75+	55	120	163	64	7	1700	42	0.7	1.3	15	60	3.0	300	2.0	750	7.5	8	800	9	15
	Pregnancy (Second Half) ⁺		-	-	-	-	10	2400	60	1.0	1.6	18	80	4.0	500	2.6	750	10	10	1200	15	20
	Lactation (First Six Months) ⁺		-	-	-	-	11.5	2700	69	1.1	1.8	21	80	4.0	400	2.5	1200	10	11	1200	15	25

* Based on 75% biological utilisation.

† These figures are based on USA 1980 figures and refer, in the infant range, to the 6-12 month age group.

+ Refers to women in most occupations.

Appendix 3

Reports of the Food Safety Advisory Committee to the Minister for Health and the Minister for Agriculture, Food and Forestry, from 1989 to 1995

September 1989	Bovine Spongiform Encephalopathy
December 1989	Irradiated Food
December 1989	Listeria
April 1990	Guidelines on Cook-Chill Systems in Hospitals and Catering Premises
June 1990	Potassium Bromate in Flour
June 1990	Bovine Spongiform Encephalopathy (second report)
December 1991	Foodborne Campylobacter Enteritis
December 1991	Foodborne Salmonellosis
June 1992	Diet and Cancer
February 1994	Food Supplements and Health Foods
April 1994	Plasticisers used in Food Packaging
April 1994	Recommendations for a National Surveillance Programme of Foodborne Diseases
June 1994	Farmhouse Cheeses
June 1994	Leptospiral infections, Lyme disease, Babesiosis and Orf Virus disease
June 1994	Cryptosporidiosis Staphylococcal Food Poisoning, Foodborne Illness, Enterohaemorrhagic E. Coli (EHEC/TEC) (The above two reports were published as 'Foodborne and Zoonotic Diseases')
June 1994	Application of the Food Hygiene Regulations to small scale food enterprises operating from Domestic Kitchens
June 1994	Escherichia coli 0157:H7 and other Vero cytotoxin Producing Strains
September 1994	Irradiated Foods (Second Report)
October 1994	Diet and Cancer (Updated version)
April 1995	Microbiological Standards Limits and Guidelines for Foods

