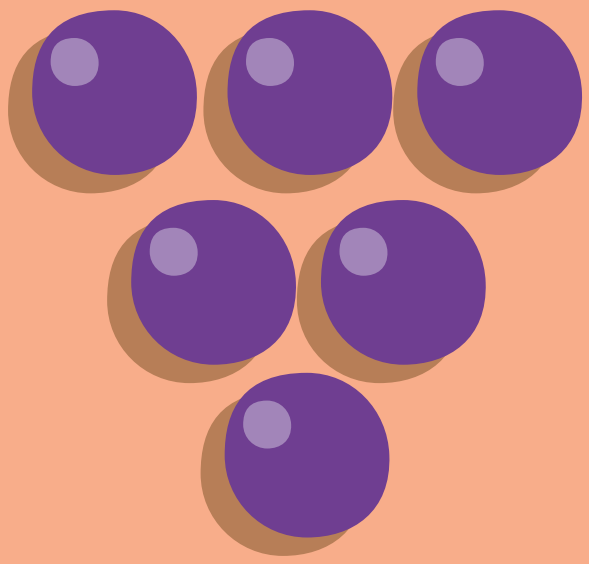
safefood

FOOD BEHAVIOURS 1234

Healthy Eating

on the Island of Ireland



be safe be healthy be well

Volume 2

Nutrition-related behaviour on the island of Ireland

This document is the second in a three volume series. The terms of reference for the series are outlined in the introduction, which also provides an overview of the environmental, social and personal factors that can affect food behaviour. Volume 1 outlines the historical context of food safety issues on the island of Ireland (IOI), explains the major current public health issues and describes the available research on influences on food safety behaviour. Volume 2 provides the same information in relation to public health nutrition. Volume 3 relates to behaviour change and explores the development of behaviour change methods, current understanding of best practice and learnings from intervention studies. Recommendations for further research and for promotion of food-related behaviour change on the IOI have also been developed for each part of the report. This volume:

1. Gives an account of the major public health nutrition issues on the island of Ireland and explains the related behaviours
2. Outlines food behaviour research conducted on the island of Ireland to date and describes research carried out by ***safe***food for the purposes of the report
3. Identifies research gaps and communication priorities.

All volumes are available on www.safefood.eu

Abbreviations

BSE	Bovine Spongiform Encephalopathy
CAP	Common Agricultural Policy
CAPI	Computer Assisted Personal Interviewing
CFR	Consumer Focused Review
CHD	Coronary Heart Disease
CHO	Carbohydrate
COMA	Committee on Medical Aspects of Food Policy
CVD	Cardiovascular Disease
DALY	Disability-adjusted life year
DHSSPS	Department of Health, Social Services and Public Safety
DOHC	Department of Health and Children
EEC	European Economic Community
EFSA	European Food Safety Authority
EU	European Union
FSA	Food Standards Agency
FSAI	Food Safety Authority of Ireland

GATT	General Agreement on Tariffs and Trade
HPA	Health Protection Agency
HPA	Health Promotion Agency
IEFS	Institute of European Food Studies
IOI	Island of Ireland
IUNA	Irish Universities Nutrition Alliance
LINDNS	Low Income National Food and Nutrition Survey
MAFF	Ministry of Agriculture, Fisheries and Food
MUFA	Monounsaturated fats
NANS	National Adults Nutrition Survey
NCD	Non-communicable disease
NCFS	National Children's Food Survey
NDNS	National Diet and Nutrition Survey
NI	Northern Ireland
NMES	Non-milk extrinsic sugars
NSIFCS	North South Ireland Food Consumption Survey
NSP	Non-starch polysaccharides

NTFS	National Teen Food Survey
PHA	Public Health Agency
PUFA	Polyunsaturated fats
RDAs	Recommended Daily Allowances
ROI	Republic of Ireland
SFA	Saturated Fats
SLÁN	Survey of Lifestyle, Attitudes and Nutrition in Ireland
TNS	Taylor Nelson Sofres Consumer face-to-face omnibus survey
UK	United Kingdom
USDA	United States Department of Agriculture
WHO	World Health Organisation

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Glossary

Atkins diet: The Atkins diet, officially called the Atkins Nutritional Approach, is a low-carbohydrate diet created by Robert Atkins. The diet involves restriction of carbohydrates to more frequently switch the body's metabolism from burning glucose as fuel to burning stored body fat.

Disability-adjusted life years (DALYS): The disability-adjusted life year (DALY) is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death. DALYS combine mortality and morbidity data into a single, common metric. One DALY can be thought of as one lost year of "healthy" life.

Focus group: A focus group is a form of qualitative research in which a group of people are asked about their perceptions, opinions, beliefs and attitudes towards a product, service, advertisement, concept or idea. Questions are asked in an interactive group setting where participants are free to talk with other group members.

Health fatalism: Fatalism is a doctrine that describes how all things are subject to fate and take place by inevitable necessity. Therefore health fatalism describes how one's health is subject to fate, is predetermined and how we are powerless to change health outcomes.

Macronutrients: Macronutrients are nutrients that the body uses in relatively large amounts to provide calories/energy. There are three broad classes of macro-nutrients: proteins, carbohydrates, and fats.

Micronutrients: Micronutrients are essential nutrients required by humans in minuscule amounts that the body itself cannot produce. They are needed to sustain life and play a part in a wide range of physiological functions. They include nutrients such as vitamins, minerals, anti-oxidants, enzymes and phyto-chemicals.

Psychometric: Psychometrics is the field of study concerned with the theory and technique of educational measurement and psychological measurement, which includes the measurement of knowledge, abilities, attitudes, and personality traits. The field is primarily concerned with the construction and validation of measurement instruments, such as questionnaires, tests, and personality assessments.

Resilience: Resilience in psychology is the positive capacity of people to cope with stress and keep their cool when problems or setbacks occur. Closely related with resilience are the terms "hardiness", "resourcefulness" and "mental toughness".

Top-shelf foods: Foods from the top shelf are generally high in calories, fat and/or sugar. These foods should be chosen in very small amounts.

Executive summary

Volume 2 Nutrition-related behaviour on the island of Ireland

This report:

1. Gives an account of the major public health nutrition issues on the island of Ireland and explains the related behaviours
2. Outlines food behaviour research conducted on the island of Ireland to date and describes research carried out by *safe*food for the purposes of the report.
3. Identifies research gaps and communication priorities.

In the past 150 years, industrialisation, urbanisation, commercialisation and social changes have transformed the social and economic landscape on the island of Ireland (IOI). Much of the current legislation, policy and structure in public health nutrition is influenced by this historical landscape and in particular by the growing comprehension of the link between diet and health during the same period. With this revolution came a transformation of the often meagre, monotonous diets of the population into the highly diversified and ample diets of today. This has resulted in the population changing from being largely undernourished to a situation where approximately two thirds of the population is overweight. In response to this evidence, since 1990 there have been significant developments on the IOI in relation to research, policy and infrastructure to promote better nutritional health among consumers.

Current public health nutrition issues on the island of Ireland

Changes in lifestyles and finances in recent decades have resulted in a shift in eating patterns, a breakdown of traditional eating habits and the availability of high energy foods. In the UK and the ROI, overconsumption of food is now the norm and a high rate of lifestyle associated diseases such as cardiovascular disease (CVD), diabetes and cancer is apparent.

In response, like in most countries, health authorities in the UK and Ireland set population dietary goals for macronutrients and certain micronutrients aimed at preventing long-term NCDs. These are also used as a reference to monitor dietary changes at a population level through surveillance. Table 1 outlines details of current foods and nutrient intakes of specific populatigroups compared to national guidelines. The level of achievement of various dietary recommendations across different population groups on the IOI is summarised in Table 2. Currently, many of the population dietary targets are not being met.

Imbalances in dietary intake have many health consequences including excess weight, obesity and increased risk of NCD. With being overweight and/or obese regarded as the 'norm' among adults, coupled with an increasing prevalence among children and adolescents, excess weight has become the most important public health nutrition issue of our time. Tackling this issue is particularly important given that excess weight is a risk factor for many of the other NCDs. At an individual level NCDs impact hugely on health and quality of life. Five of the top seven leading risk factors for ill health in Europe, including the IOI, are diet-related and include blood pressure, alcohol, cholesterol, high body mass index, and low fruit and vegetable intake.

With dietary imbalances having a strong impact on NCD it is not surprising that they have a major economic cost on the IOI. For obesity alone the direct health costs in the ROI in 2004 were €13.3 million with estimated indirect costs of €4 billion per year. In the UK, the costs of excess-weight and obesity to the National Health Service has been estimated at £1 billion while the total impact on employment may be as much as £10 billion.

Table 1: Current mean food and nutrient intakes of populations surveyed on the IOI compared to population target (3)

		Actual mean intake of food/nutrient in the different surveys									
Survey title		**NCFS**	**NTFS**	**NSIFCS**	**NANS**	**Low Income Diet and Nutrition Survey**					
Region		**ROI**	**ROI**	**NI & ROI**	**ROI**	**UK**					
Year of survey		**2003/4**	**2005-6**	**1997/8**	**2008/10**	**2003/5**					
Sample size (n)		**594**	**441**	**1379**	**1500**	**3728**					
Age group (y)		**5-12**	**13-17**	**18-64**	**18-90**	**2-10**	**11-18**	**19-34**	**35-49**	**50-64**	**65+**
Food/Nutrient	**Target****										
Fruits and vegetables (g/d)	>400	208	200	251	192	M 169 F 202	M 145 F 180	M 200 F 209	M 178 F 195	M 257 F 247	M 230 F 234
CHO (% energy)	≥50	52	49	44.3	45.5	M 51 F 51.5	M 50.5 F 50.4	M 48.5 F 50.1	M 47.3 F 48.1	M 48 F 48	M 47.5 F 48.1
Total Fat (% energy)	≤ 35	34	35.6	35.2	36.9	M 35.9 F 35.3	M 36.4 F 36.3	M 36.2 F 34.8	M 36.4 F 35.5	M 35 F 35	M 36 F 35.2
SFA (% energy)	≤ 11%	14.7	14.4	14		M 14.6 F 14.4	M 13.7 F 13.5	M 13.4 F 13.0	M 13.4 F 13.6	M 13.3 F 13.6	M 14.4 F 14.5
PUFA (% energy)	~6.5%	4.9	5.8	7		M 5.3 F 5.2	M 6.1 F 6.3	M 6.0 F 6.0	M 6.2 F 6.0	M 5.7 F 5.7	M 5.7 F 5.9
MUFA (% energy)	12%	11.6	12.7	12		M 12.0	M 12.8	M 12.7	M 12.7	M 11.8	M 11.6

						F 11.9	F 12.7	F 11.9	F 11.9	F 11.5	F 11.1
Added Sugar (NMES)(g/d)	<11%	14.6	12.4	9.3		M 17.0 F 16.7	M 17.2 F 16.3	M 16.2 F 16.3	M 14.8 F 12.6	M 14.5 F 11.6	M 13.1 F 12.1
Fibre or NSP* (g/d)	Adults:18 g NSP or 25g fibre Children: Age + 5g	9.4	11.6	14.8	19.2 (fibre)	M 10.1 F 9.2	M 12.6 F 11.5	M 13.4 F 10.6	M 12.2 F 10.4	M 12.9 F 11.2	M 12.3 F 10.9
Salt (g/d)	<6 Less for children <10y	4.6 (5-6y) 4.3 (7-10y) 6 (11-12y)	6.3	10	7.4	M 5.3 F 5.0	M 7.4 F 6.2	M 8.0 F 5.5	M 7.3 F 5.3	M 7.1 F 5.3	M 6.7 F 5.0

*NCFS – National Children's Food Survey (46), NTFS – National Teens' Food Survey (47), NISFCS – North South Ireland Food Consumption Survey (53); NANS – National Adult Nutrition Survey (50), LINDNS – Low Income National Food and Nutrition Survey (33).

CHO- Carbohydrate; SFA – Saturated Fats, PUFA – Polyunsaturated fats; MUFA – Monounsaturated fats; NMES – Non-milk extrinsic sugars; NSP – Non-starch polysaccharides; M – males; F- females,

** Targets (3) except for Fibre –NSP values given for LINDNS, American Heart Association guidelines for fibre applied in NCFS (57).

Table 2: Broad summaries of the achievement (√) and non achievement (x) of dietary recommendations across different population groups on the island of Ireland

	Children (5-12y)	Teenagers (12+y)	Adults
Fruit and vegetables (>400g)	x	x	x
CHO content (>50% energy)	√	x	x
Added Sugar (<10% energy)	x	x	√
Fat content (≤35% energy)	√	x	x
Total PUFA (<6% energy)	√	√	√
MUFA (12% energy)	x	x	x
Fibre (≥18g/d)	x	x	x
Salt (≤ 6g/d)	x	x	x

Key dietary behaviours of public health concern

Maintaining a healthy weight has a major beneficial effect on protecting individuals from many NCDs. A number of other common dietary-related factors and behaviours are also protective. These include the daily inclusion of 400g fruit and vegetables and other fibre rich foods such as whole grains and oily fish. Selecting appropriate portion sizes and low energy dense foods (i.e. low in fat and calories) is also vital for good health. Choosing mostly plant-based foods supports a lower energy-dense diet and a more favourable balance in terms of fatty acid content in the diet. Choosing fewer processed foods or processed foods with a low salt content is a key behaviour for CVD and certain cancers. In addition to the types of foods chosen, the timing and frequency of consumption of sugary and acidic foods is particularly important for dental health. Eating outside of the home can have an impact on nutritional intake as this food is higher in fat and thus more energy dense. Dietary studies on the IOI in both adults and children have found that many of these protective behaviours are not being practiced. For example, NCFS shows that 18 per cent of children's energy and 15 per cent of teenagers' energy was from confectionery, snacks and biscuits, while 21 per cent of children's fat intake and 18 per cent of teenagers' fat intake was from confectionery, snacks and biscuits. The recent SLAÁN survey among adults showed consumption of almost four portions a day of foods that are classed as energy-dense, micro-nutrient poor.

Influences on nutrition-related behaviour on the island of Ireland

While the influences of food behaviour are multi-factorial and are derived from the wider environment, social situation and personal factors, much of the research conducted on the island relates only to knowledge, attitudes and perceptions of healthy eating and nutrition issues. In addition, the sampling frames, timing and methods also varied between studies, making direct comparisons between studies and jurisdictions difficult. While there is an attempt here to draw conclusions and make recommendations based on the available information, it must be borne in mind that caution should be applied to interpretations and that findings from one jurisdiction may not apply in another.

Consumers listed food factors such as freshness and taste, social factors such as family preferences, personal factors including a desire to eat healthily and habit, and economic factors such as price as key influencers of food choice. Wider environmental factors were rarely identified or investigated in the research that has been conducted to date.

Barriers to healthy eating on the island included a variety of personal, social and cultural factors; the belief among consumers that their diets are already healthy enough, health fatalism, optimistic bias, taste and a perception that healthy foods taste bad, and the widespread availability of 'treat' foods. Consumers were also challenged by a lack of time and by a feeling that they had low willpower. In

relation to obesity specifically, misperception of body weight among men particularly and among parents of overweight children may mean that current health promotion efforts to reduce obesity may not appear relevant to important target audiences. Equally, a large proportion of normal weight teenagers believe they need to lose weight. Therefore, addressing body weight misperceptions is an important step in promoting healthy body weights on the island.

Nutritional knowledge

Overall, there was a reasonable awareness of what healthy eating means among both adults and children. Large proportions of consumers were able to mention aspects such as 'reduce fat intake', 'eat more fruit and vegetables', 'eat a balanced and varied diet', 'more fibre' and 'less sugar'. However, many people remain unaware of key healthy eating guidelines. Men, or those from manual working groups, had poorer knowledge and may benefit more from intervention.

Attitudes to diet and nutrition

When prompted, key nutritional concerns included fat, saturated fat, salt content of food and body weight. However, nutritional concerns were not top of mind for many consumers and were spontaneously mentioned in surveys by only a small proportion of those interviewed. This may indicate that risks with long term consequences elicit a less acute response compared to those with immediate and perhaps more tangible consequences. This represents a key challenge for those working to change nutrition behaviour.

Current consumer concerns, attitudes, perceptions and barriers to nutrition on the island of Ireland: *safe*food research

To inform this review of consumer food behaviour, ***safe***food commissioned research to identify key consumer concerns, attitudes, beliefs and behaviours relating to healthy eating on the IOI. This research aimed to provide additional up-to-date information on the factors that drive eating behaviour and the barriers to behaviour change. A mixed methodology (qualitative and quantitative research) was undertaken. While the data provides some insight into the factors that drive behaviours, the limitations of both qualitative and quantitative research must be borne in mind in extrapolating the findings to the entire population.

The quantitative research, which was carried out by Millward Brown Lansdowne in late 2009, formed part of ***safe***food***'s*** bi-annual consumer tracking research entitled Safetrak. The questions used reflect previous questions included in ***safe***food's Safetrak and aimed to address some of the influences identified in this report. Nationally representative samples of adults aged 15-74 years were interviewed face-to-face, at home in the ROI (n=504) and NI (n =300). The methodology used quota sampling as a basis to ensure the sample was representative of the population on the IOI in terms of age, gender, region, marital status and social grade.

The qualitative research involved a series of six focus groups in a variety of population groups and locations on the IOI. The research aimed to explore factors including knowledge, attitudes, prior experience, social norms, self-efficacy, habit, emotion and contextual factors in relation to healthy eating. It also explored knowledge, attitudes and perceptions around healthy eating, motivations for change and factors participants felt would help them change their current behaviours. The findings are summarised below:

Knowledge

- Consumer understanding of "healthy eating" included aspects such as having a balanced diet, eating more vegetables, fruit and less fatty food. Only three per cent of consumers spontaneously mentioned "not to overeat".
- Most people (70 per cent) understand that healthy eating provides benefits in terms of staying healthy.
- Television was the leading source of information on healthy eating for consumers.

Perceived importance of healthy eating

- Sixty one per cent of respondents on the IOI (65 per cent in the ROI and 52 per cent in NI)

claimed to think about healthy eating when they choose food.

- Those with third level education were more likely to consider the healthiness of the food before purchasing (71 per cent), those aged 15-25 years were less likely to do so (44 per cent).
- Most consumers were concerned about healthy eating with 79 per cent of respondents in the ROI and 71 per cent in NI acknowledging that healthy eating was very important.
- While the *safetrak* data indicated that maintaining health was a key motivation for healthy eating, the focus group research showed that in reality most individuals attached less importance to long-term health outcomes, compared with short-term outcomes such as mood change or weight loss.

Relevance and meaning of food for consumers

- Food provided many functions that differed by gender; women emphasised meals in the context of feeling full, whereas men conceptualised food as fuel.
- Focus group participants viewed their bodies as vehicles to carry out their daily tasks; going to work, picking up kids, staying well. They did not require their bodies to function at their maximum potential nor did they feel this would be relevant.

Influences on food behaviour

- In addition to consumer knowledge, attitudes and perceptions of healthy eating, the focus group and Safetrak survey revealed several personal factors that influenced the diets of consumers including; life stage and lifestyle, weight control (for women), stage of change, emotional eating, self-regulation, optimistic bias and health fatalism.
- Social influences included familial influences such as shared meals, family preferences, family support and childhood conditioning.
- External environmental influences mentioned by participants included time of day, calendar effects, season and climate.

Perceived need to change and dietary change

- Most respondents perceived themselves to be very or quite healthy (87 per cent).

- Approximately one in four consumers surveyed felt that they needed to make changes to their diet. Key dietary changes included eating more fruit and vegetables, less 'treat' foods and reducing fat and salt intakes.
- A large proportion of consumers (43 per cent) had never made any changes to their diet with a view to improving health.

Barriers to healthy eating

- Key barriers to healthy eating included time, food preferences, cost, lack of willpower, and the perceived difficulty of making changes.
- Focus group participants also mentioned cost, time and lifestyle and discussed the ready availability of fast foods and convenience foods and felt that the food market is weighted against healthy eating.

Potential promoters of dietary change

- Suggestions by consumers for promoting dietary change included changing the food marketplace to facilitate healthy food choices, involvement in sport and regular medical checks.

Conclusions

On the IOI over the past 150 years, the population's nutrition status has changed from being largely undernourished to a norm of overconsumption. The result is that major public health nutrition issues, particularly obesity and related non-communicable diseases such heart disease, diabetes and cancer are now widespread. Survey data also shows that the diets of both children and adults are often far from ideal with excessive intakes of fat and salt and inadequate intakes of fruit, vegetables and fibre.

While the public health nutrition issues are clear and concerning, from an attitudinal perspective, in general, consumers seem conflicted about healthy eating. Many understand what it means, know about the longer term benefits, find it important and are concerned about nutrition issues. Women, older individuals, those with higher education levels, and from higher socio-economic groups are generally more engaged with healthy eating. Yet, on a day-to-day basis, health is not really the main concern, they have busy lives and food is used sometimes to simply keep going, or for a myriad of other purposes including emotional and social reasons.

Consumers identified a wide variety of barriers to healthy eating included time, food preferences, cost, lack of willpower, and the perceived difficulty of making changes. Focus group participants discussed the ready availability of fast foods and convenience foods and felt that the food market is weighted against healthy eating. Added to this is a widespread perception among consumers that that their diets are already healthy enough and a belief that they can regulate their diet despite opposing influences.

The findings of this report provide new insights and some direction for all those working towards changing food behaviour on the IOI, however many gaps in the evidence base remain. Recommendations for future research and communications are found below.

Recommendations

Research recommendations for nutrition-related behaviour change on the IOI

Knowledge gap	Public health implication(s)	Recommendation/solution
A wide variety of nutrition surveillance surveys using differing methodologies make comparisons difficult.	Difficulty identifying trends in population nutritional health and monitoring change.	1. Develop a co-ordinated, all-island approach to monitoring trends in nutrition related non-communicable diseases and in population dietary intakes. 2. Identify important target groups and develop key communication messages based on the findings of nutrition surveillance data.
No longitudinal studies of public knowledge, attitudes and perceptions relating to nutrition issues using consistent methodologies.	1. Difficulty tracking change. 2. No clear understanding of consumer attitudes.	1. Co-ordinated approach by agencies to fund a long-term survey. 2. Supporting qualitative research would offer an additional method to gain in-depth insights into consumer behaviour.
Data on influences on food choice on the IOI are mainly limited to studies of knowledge, attitudes and perceptions of healthy eating and nutrition issues.	Lack of data on wide influences such as the economic environment, the media environment, food and built environment and food and health policies may result in over emphasis on promotion of change in individuals rather than the whole eating environment.	Consideration of broad set of influences in the design of research studies on food behaviour on IOI.
The evidence base for food-related behaviour in children and teenagers on the IOI is particularly low and must be	Better understanding and early intervention may results in effective behaviour change.	Studies to gain insight into food related behaviour in this important group with a view to development of

built in order to target these groups effectively.		effective interventions.
Little research on IOI on the development of psychological factors that could build capacity and help prevent obesity.	Factors such as low resilience, low self esteem, optimistic bias and health fatalism may affect an individual's ability to make healthy food choices.	Development of multidisciplinary studies to design interventions to tackle psychological factors, particularly in vulnerable groups such as low income women.
Growing evidence of widespread misperception of body weight but poor understanding of how to overcome this.	1. Body weight misperception presents and important barrier to obesity-related behaviour change. 2. While realistic body weight perception may motivate girls to eat healthily, misperceptions of body weight among normal weight girls may result in unnecessary body weight concerns.	1. Studies to investigate effective methods to promote realistic perception of body weight. 2. Research is warranted as how best to communicate and motivate young women to eat healthily while maintaining positive body image.
Men have been identified as a vulnerable group but effective means to promote behaviour change within this group on the IOI deserves further study.	Better understanding of food-related behaviour in men may result in effective behaviour change.	1. Effective methods to promote behaviour change in men should be explored including the use of sports or physical activity involvement as a vehicle, the role of the GP, incorporating elements of competition, the role of women as influencers and food providers and identification of key settings. 2. For boys, further understanding of the link between physical activity/sports participation and healthy eating is necessary.
The use of social media on the IOI has expanded enormously in recent years but its use in promotion of food-related behaviour change remains	Great potential to reach large audiences and inaccessible audiences, such as young men and women.	Development of evaluation studies for the use of social media in food-related health promotion.

untapped.		

Recommendations for communication of nutrition-related behaviour change on the IOI

Priorities for communication/intervention	Public health implication(s)	Recommendation/ solution
Highlight the importance of public health nutrition issues in preventative health.	Improve potential for the prevention of non-communicable disease.	1. Communicate research results and evaluation of behaviour change programmes to policy makers, stakeholders and the public. 2. Develop media advocacy programmes.
Those from lower socioeconomic groups and with lower education status should be key targets for healthy eating initiatives.	Targeting of most vulnerable groups for health improvement/disease prevention.	1. Develop a co-ordinated approach to tackling food poverty. 2. Development of appropriate initiatives that are designed to effectively target these groups.
The family should remain a key target group for nutrition messages due to the importance of familial influences and early conditioning.	Potential for long-term positive influence.	Further development of healthy eating initiatives and resources appropriate for families.
Continued emphasis should be put on improving nutrition knowledge among the public. Men and those from low-income groups should be targeted in particular.	While knowledge alone will not change behaviour, knowledge is an important antecedent of behaviour change.	Continued campaigns to raise awareness of healthy eating, particularly in key target groups.
The rarity of unprompted mention of nutrition-related concerns indicated that continued effort must be made to ensure the relationship between food and health becomes top of mind for consumers.	A more realistic understanding of the relationship between food and health may promote positive behaviour change.	Messages that focus on encouraging the public to examine their eating and reflect on possible changes.

Psychological factors such as health fatalism, optimistic bias, a perception of low willpower and emotional factors should be considered in the development of nutrition messaging, particularly in low income groups.	Overcoming barriers to healthy eating.	Development of interventions.
A lack of awareness of body weight status appears to be a major barrier to weight loss, particularly in children and in men, and deserves focus in obesity behaviour change programmes.	Overcoming barriers to behaviour change.	Development of public messages.
Behaviour change efforts that move people from pre-contemplation to contemplation, may be key.	Increase relevance of behaviour change.	1. Development of resources and tools for individuals. 2. Development of public message.
Relevance of long-term consequences of unhealthy eating is low.	Improve potential for behaviour change.	Promote understanding and relevance of long-term consequences of unhealthy eating.
Acknowledge key influences and barriers such as vulnerable times of day (evening eating), calendar effects (weekend and holiday), time, cost, lifestyle, availability of fast and convenient food, should be considered.	Overcoming barriers to behaviour change.	Consider important influences and barriers in the development of healthy eating programmes.
Promotion of healthy body weight should be communicated differently to each sex. Males in particular do not perceive being overweight as a problem. Parents widely misperceive	Targeting may improve effectiveness of behaviour change programmes.	Development of effective campaigns to overcome misperception of body weight in key target groups is essential in tackling obesity.

their children's body weight.		
The mass media remains an important channel for communicating nutrition messages.	Potential for awareness-raising among large population group.	Continued use of the mass media to promote behaviour change.
Key settings for the promotion of behaviour change include schools and workplaces	Target group through existing structures.	Targeted at specific groups.
Social media and mobile communications present potentially important new media for the promotion of behaviour change.	Improved reach for behaviour change message and consumer engagement.	Develop social media campaigns to promote behaviour change.

1 Historical context and current public health issues

Key findings

1.1 Introduction

1.2 Nutrition issues: an historical perspective

1.3 Current public health nutrition issues and related behaviours

1.4 Conclusions

Key findings

- An historical review of diets on the island of Ireland (IOI) demonstrates changes characteristic of the 'nutrition transition' i.e. a move from a situation of malnutrition through to a situation of excess food and high prevalence of chronic diet related non-communicable disease (NCD).

- Awareness of the importance of diet to population health began in the United Kingdom (UK) in the early 1900s. This is much later than the emergence of infectious diseases as a public health issue in the 1700s.

- Since the early 1990s there has been an emergence of public policy and related initiatives e.g. establishment of health promotion organisations focused at tackling lifestyle related NCDs.

- Many dietary imbalances exist across all age groups on the IOI. Poor food behaviours have translated into very low intake of specific micronutrients. There is evidence of excessive intakes of certain nutrients such as fat, saturated fat, sugar (in children) and salt.

- NCDs impact on quality of life for individuals with dietary imbalances and physical inactivity in the EU having similar impacts on disability-adjusted life years (DALYS) compared to smoking. The economic costs of diet-related NCDs is enormous.

- Obesity is the most significant public health issue on the IOI with two out of every three adults overweight/obese and one in every four children overweight/obese. Economic costs, direct and indirect, have been estimated at €4 billion in the Republic of Ireland (ROI) and £100 billion in the UK.

- The dietary behaviours associated with NCDs provide a limited number of dietary behaviours to target for prevention.

- Inequalities in access to a healthy balanced diet exist on the IOI.

1.1 Introduction

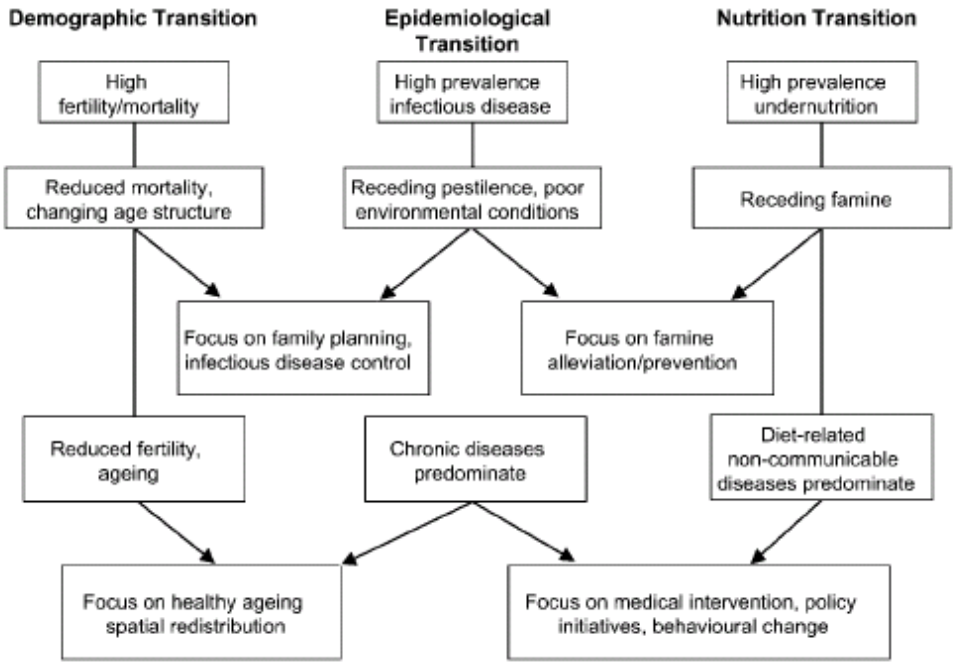
In the past 150 years, industrialisation, urbanisation, commercialisation and social changes have transformed the social and economic landscape on the IOI. With this revolution came a transformation of the often meagre, monotonous diets of the population into the highly diversified and ample diets of today. This has resulted in the population changing from being largely undernourished to a situation where the majority of individuals are overweight. This chapter aims to describe the historical change in nutrition over the last 150 years, in particular since 1990 when many of the current policies and initiatives evolved. Much of the current legislation, policy and structure are influenced by the historical landscape and in particular the growing comprehension of the link between diet and health. The chapter will end by outlining the current public health nutrition issues on the IOI.

1.2 Nutrition issues - an historical perspective

1.2.1 The nutrition transition

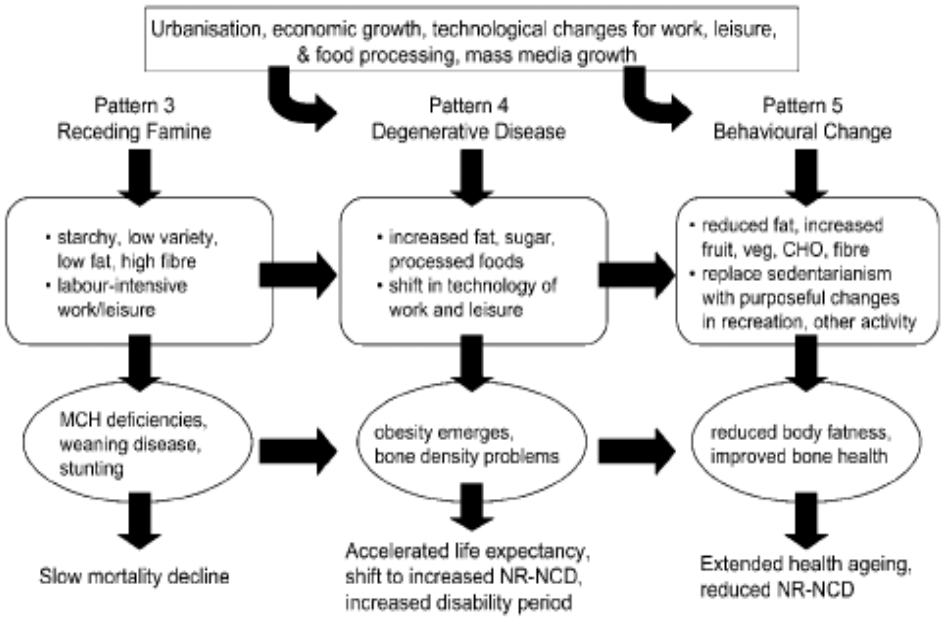
This transformation of diets that has largely occurred in the past 150 years is consistent throughout Western Society. Economic development is accompanied by improvements in a country's food supply and increased imports (5). In association, changes in diets and patterns of work and leisure occur that are often referred to as the 'nutrition transition'. Popkin (2002) (1) summarised the stages of nutrition transitions in parallel to the changes that occur in population characteristics and associated changes in health and disease (Figure 1.1).

Figure 1.1: Stages of health, nutritional and demographic change (Popkin, 2002)(1)



Societies move from a situation where there are both high birth and mortality rates, high prevalence of infectious disease and malnutrition, through to a situation where there is reduced fertility and increased longevity, and high prevalence of chronic diet-related non communicable disease (NCD). Figure 1.2 describes the dietary patterns in this nutrition transition. Many developed countries including the ROI and the UK are currently attempting to move dietary patterns from pattern four to that of pattern five (Figure 1.2).

Figure 1.2: Stages of nutrition transition (Popkin, 2002) (1).



Famine and high rates of infant mortality and infectious disease were realities on the IOI during the nineteenth century. Following the famine, a move towards providing sufficient food to meet basic nutrition requirements occurred through to post-war years. Since then there has been a shift in dietary patterns towards higher fat and sugar intakes and a rise in obesity and chronic disease rates. Table 1.1 demonstrates the many landmarks in public health nutrition from a UK perspective. Many of these changes were initiated in the UK.

1.2.2 Awareness of the link between diet and health

The UK led the way for many of the changes in public health nutrition in the nineteenth and twentieth centres (Table 1.1). Many of the changes that occurred also happened in parallel or subsequently on the IOI. The first real awareness of the importance of diet to health and the intervention of UK government occurred in the early 1900s. The British government became very interested in the link between food and health following the near loss of the Boer War (1899 – 1902) where many of the soldiers were found to be malnourished and in poor health (2). This triggered research into the causal link between diet and health and resulted in the initiation of intervention programmes, which have since evolved. Some of these still exist today. Public health interventions targeted at specific age groups e.g. school meals scheme (1906) and the promotion of milk (1920) began in the early 20th century (2). The focus of subsequent research in the early to mid twentieth century however, was on the constituents within food that promote health, for example, vitamins and minerals. This greatly advanced the understanding of the role of nutrition in health.

Table 1.1: Landmarks in the field of health, food and nutrition in the UK 1750-2000 [adapted from James, 2000 (2)].

	Year	Health, food and nutrition landmarks
1750s - 1918	1750s	Scurvy treated by lime juice
	1830-1850	Famines, epidemics, infections. Rickets treated by cod liver oil or butter
	1850-1900	Germ theory of disease. Improved hygiene, decline of infectious disease and childhood mortality; immunisation
	1899	Unfit, underweight army recruits in Boer War
	1900	Urbanisation, city slums, poor working class, malnutrition
	1905	Search for vitamins and accessory food factors expands
	1906	School meals start in the UK
	1918	Concept of protective foods: milk, fruit, vegetables
1919-1949	1920	Promotion of milk
Search for accessory food factors and vitamins by the Medical Research Council in the UK	1930	Boyd Or's 'Food, Health and Income' in UK
	1933	Milk marketing boards in UK
	1940-1945	Success of British food policies and rationing

1950s – 2000s			
Nutritional diseases studied in the colonies	1950-1970s	Agricultural research priorities to increase meat, milk, butter production. Intensive rearing of pigs and chicken. Blossoming of food industry, multinationals, convenience foods and supermarkets	Food safety, food technology, food labelling, Recommended Daily Intakes (RDAs). Vitamin and biochemical research but dwindling research on other aspects of human nutrition
Western countries adopt Western diets and Western diseases	1980s	Western food mountains	
	1990s	Tariff adjustments, CAP, GATT BSE, *Salmonella* and E. coli food scares	
	2000s	Obesity epidemic with associated non communicable diseases	

A continued focus on the prevention of nutritional deficiencies occurred during World War II, with the development of the first UK healthy eating guidelines and public awareness campaigns. Early dietary guidelines emphasised the consumption of 'protective foods' such as dairy foods, fruits and vegetables. These were rich sources of known vitamins and minerals, which reflected the growing understanding of the role of vitamins and minerals in health (6). The focus was on promoting health through the prevention of infectious disease and nutritional deficiencies. The successful policy of rationing food, which aimed to provide sufficient food to meet nutritional requirements in the face of limited food supply, was accompanied by intense nutritional education emphasising skills.

In 1939 the advent of food fortification with vitamins occurred. The UK government took action to safeguard the nutritional status of their nation by making the addition of vitamin A and D to margarine compulsory. Mandatory fortification of bread with thiamine, niacin, calcium and iron followed in 1940 (7). This mandatory fortification process has remained until the present day, while in the ROI fortification with micronutrients is done on a voluntary basis.

1.2.3 Nutrition surveillance

In the 1940s, the first nutrition surveillance activities at a population level occurred in the UK and the ROI, and the data generated were pertinent to the development of food standards, nutritional guidelines and legislation around nutrition.

In the UK, The National Food Survey is the longest-running continuous government social survey, and was set up in the 1940s to monitor the diet of the urban 'working class' population. In 1950 it was extended to cover all households in the general population and to collect data on food consumption and expenditure (8). More recently, the UK established the National Diet and Nutrition survey in 1992, which is now carried out on an annual rolling basis.

In Ireland, the first recorded such survey - *The National Nutrition Survey of Ireland in 1948* - found the population on the whole to have a nutritionally adequate diet, although certain sub-groups of the population had low intakes of some nutrients (9). Although surveys have not been carried out regularly on the IOI the information provided has been very useful. For example, the increase in obesity on the island is demonstrated effectively by a recent comparison of the heights and weights of Irish children aged 4 to 14 years collected in 1948, 1970 and 2002 (10). The data demonstrate that heights increased by 23cm in boys and by 15.6cm in girls between 1948 and 2002. However, weights increased disproportionately. For example, 14 year old boys weighed 24kg more in 2002 than they did in 1948.

1.2.4 Key public health nutrition policies on IOI since 1990

Following the post-war years, the advancement of agricultural policies, food processing and preservation, and greater food security meant that undernutrition became less of a concern and the traditional nutritional deficiency diseases such as rickets were almost eliminated. The European Economic Community (EEC), which the ROI and the UK joined in 1973, provided for the expansion of the food industry with both manufacturing and retail improving access to food for the public. One result was the availability of more highly processed and often energy-dense food. Increasing consumption of saturated fats and sugar was evident in nutrition surveys conducted in the 1980s in both the ROI and the UK (11).

Particularly since the 1990s, both jurisdictions on the IOI have seen great economic growth. Changes in lifestyles and finances resulted in a shift in eating patterns, a breakdown of traditional eating habits, the availability of high-energy foods and in particular a move towards eating more food 'out of home' which tends to be higher in fat and calories (12). It was not until the late 1980s when epidemiological evidence highlighted the growing prevalence of diet-related NCDs that an emphasis on diet and health was seen again in public policy. In the UK and the ROI, the nutrition transition was complete to a stage (Figure 1.2, pattern 4) where overconsumption of food was a norm and a high rate of lifestyle associated diseases such as cardiovascular disease (CVD), diabetes and cancer was apparent (3, 13). A new impetus in terms of public health policy emerged.

On the IOI, health promotion agencies and departments were established in both jurisdictions (14, 15). In the ROI the Health Promotion Unit of the Department of Health and Children (DOHC) was formed in 1989. The Health Promotion Agency (HPA) was established in Northern Ireland (NI) in 1990 and was in existence until 2009 when its function was transferred to the Public Health Agency (PHA). Over the past two decades, momentum has grown in terms of the policy and initiatives focused on nutrition and health (Tables 1.2, 1.3 and 1.4). Population targets for food and nutrition, along with public health strategies that incorporated these targets, were developed. ***safe***food was established on the island in 1999 as the first cross border body addressing nutrition issues.

The key nutrition policy and initiative milestones in NI, the ROI and internationally are highlighted in Tables 1.2, 1.3 and 1.4 respectively. Obesity has been the key focus of public health nutrition in recent years both internationally and on the IOI. In 2007, both the ROI and NI departments of health developed and published strategies to tackle obesity which are being supported by implementation groups in both jurisdictions (16, 17).

International initiatives have played a key role in public health nutrition on the IOI. At an international level, the evidence supporting a role of diet and health has strengthened (5, 18). In the early 2000s, the Eurodiet project highlighted the extent of the problem of diet-related NCDs in Europe (19). Since the establishment of the EU Platform for Action on Diet, Physical Activity and Health, more emphasis and greater collaboration in the area of diet and health is evident (20, 21). The strategy (21) has placed initial emphasis on reducing salt intakes among the EU population.

Today, most if not all of our national food legislation derives from the ROI and the UK's membership of the European Union. Food law is being continuously augmented and changed. In relation to nutrition labelling of foodstuffs, directives from the EU have been implemented since 1992. Prior to this, nutrition labelling was rarely evident on food packaging and was not subject to legislative control. More recently there has been an effort to make nutrition information clearer and to provide tighter regulations around nutrient and health claims (22). Legislation providing greater control and guidance on nutrient and health claims are currently being adopted and will take some time to fully implement. A move to provide front of pack nutrition labelling has occurred with two voluntary systems in existence in the UK, the guideline daily amount system and the traffic light system developed by the Food Standards Agency NI.

Table 1.2: Key nutrition policy and initiative milestones since 1990 in NI

1990	Establishment of Health Promotion Agency (HPA) Northern Ireland (15)
1991	The Committee on Medical Aspects of Food Policy (COMA) nutrient recommendations for the population (3)
1992	'Health of the Nation' strategy (23)
1992	Nutrition Task Force - recommendations on education and information, catering and the food chain, the National Health Service and health professionals (24)
1992	Establishment of the National Diet and Nutrition Survey (NDNS) programme is a joint initiative by the Ministry of Agriculture, Fisheries and Food (MAFF) and the Department of Health (25)
1992	Regional Strategy for the Northern Ireland Health and Personal Social Services 1992– 1997 (26)
1996	*Eating and health – a food and nutrition strategy for Northern Ireland* which set recommendations and 22 action points with the aim of completion by 2002 (27)
2001	'Balance of Good Health' a visual communication tool on healthy eating (28)
2002	Investing for Health (2002) strategy for improving health in NI (29)
2006	Fit Futures (16)
2007	Foresight Report (30) Revision of the Balance of Good Health model to the 'Eatwell Plate' (31) Food Poverty and Policy in Northern Ireland report launched (32) Low income diet and nutrition survey: A Survey carried out on behalf of Food Standards Agency (33)
2008	Implementation of nutritional standards for school meals and other food in all schools across Northern Ireland (34) Obesity Prevention Strategic Framework initiated by DHSSPS
2009	HPA function transferred to PHA
2010/2011	Initial results from the rolling National Diet and Nutrition Survey of Adults (includes samples from NI) (35, 36)

Table 1.3: Key nutrition policy and initiative milestones since 1990 in ROI

1991	Nutrition Health Promotion Framework for Action (37)
1993	Adoption with minor amendments to the USDA Food Pyramid as Ireland's National Food Guide
1995	Nutrition Advisory Group - recommendation for a food and nutrition policy for Ireland (13)
1996 onwards	Subsequent policies where food and nutrition include Building Healthier Hearts (1999) (38), National Children's Strategy (2000) (39), National Health Promotion Strategy (2000) (14).
1999	National survey of the lifestyle, attitudes and nutrition of people living in Ireland (SLÁN) – results of first survey launched (40).
1999	FSAI launched revised recommended daily allowances for nutrients (41)
1999	North South Ireland Food Consumption Survey (NSIFCS) (42)
2003	Food and nutrition with guidelines being published for primary schools (43)
2003	Survey of Lifestyle, Attitudes and Nutrition in Ireland (SLÁN): Dietary habits of the Irish population (44)
2004	Food and nutrition with guidelines being published for pre-schools (43) Food Poverty and Policy report for ROI launched (45)
2005	National Children's Food Survey (46)
2005	National Obesity Taskforce Report (17)
2008	National Teens' Food Survey (47) Guidelines for Developing a Healthy Eating Policy in Post-Primary Schools (48) Survey of Lifestyle, Attitudes and Nutrition in Ireland (SLÁN): Dietary habits of the Irish population 2007 (49) Establishment of the Inter-sectoral Implementation Group of the National Taskforce on Obesity report by DOHC
2011	National Adults Nutrition Survey (50)

Table 1.4: Key milestones relevant to IOI from international and European nutrition-related policies, legislation and initiatives

(http://ec.europa.eu/health/ph_determinants/life_style/nutrition/keydocs_nutrition_en.htm; www.efsa.com)

1990	Council Directive 90/496/EEC of 24th September 1990 on nutrition labelling rules of foodstuffs – gave guidance on nutrition labelling
2000	Eurodiet core report – highlighted the burden of diet-related NCD in Europe (19)
2002	Establishment of the European Food Safety Authority
2003	Publication of the WHO 'Diet, nutrition and chronic disease' (5) overview of evidence linking nutrition and chronic disease
2005	Establishment of the EU Platform for Action on Diet, Physical Activity and Health Publication of the Green Paper "Promoting healthy diets and physical activity: a European dimension for the prevention of overweight, obesity and chronic diseases" (20)
2006	Regulation (EC) No 1925/2006 of the European Parliament and of the Council of 20 December 2006 on the addition of vitamins and minerals and of certain other substances to foods [Official Journal L 404 of 30.12.2006] (51). Regulation (EC) No 1924/2006 of the European Parliament and of the Council on nutrition and health claims made on foods – adopted by member states in 2008
2007	Launch of EU White Paper on 'A Strategy for Europe on Nutrition, Overweight and Obesity-related health issues'(21) Launch by World Cancer Research Fund/American institute for Cancer Research (2007) of report on 'Food, nutrition and physical activity, and the prevention of cancer: a global perspective' Washington DC: AICR (18).
2008	Commission Directive 2008/100/EC of 28 October 2008 amending Council Directive 90/496/EEC on nutrition labelling for foodstuffs as regards recommended daily allowances, energy conversion factors and definitions

1.3 Public health nutrition issues

The increasing emphasis of nutrition in public policy outlined in the previous section was driven by the overwhelming evidence base linking diet to health. This section puts this evidence in context of population targets and current population behaviour.

1.3.1 Population food and nutrition targets

Most countries set population dietary goals for macronutrients and certain micronutrients aimed at preventing long-term NCDs. These are also used as a reference to monitor dietary changes at a population level through surveillance. In the UK, COMA set dietary reference ranges and population targets in 1991 (3) which are supported by more recent population targets set by the World Health Organisation (WHO) (5). In 1999, the FSAI developed recommended nutrient intakes for the ROI (41) The population targets for fat, carbohydrate and fibre have recently been reviewed by the European Food Safety Authority (EFSA) (52).

Population dietary intakes in the UK and the ROI are monitored by a mixture of both food and nutrient-based targets (Table 1.5). In the UK, COMA recommendations are used. In the ROI, COMA recommendations are also used to interpret detailed surveys on food and nutrient intake such as those carried out by the Irish Universities Nutrition Alliance (53). The Survey of Lifestyles, Attitudes and Nutrition (SLAN) survey, which is the surveillance tool used in the ROI, uses quantitative measures, i.e. number of portions per food group as outlined in the Food Pyramid (54). The Food Pyramid is a pictorial representation of the ROI food based dietary guidelines. The equivalent in the UK is known as 'the Eatwell Plate' (55). Both representations are food based and provide a format that translates more complex dietary guidelines into an educational tool. For the purpose of this report, the targets used in Table 5.5 are used for comparison across the IOI.

1.3.2 Current food and nutrition intakes on the IOI

Table 1.5 outlines details of current foods and nutrient intakes from comparable studies (i.e. used similar methodology) of specific focus in population targets. The North South Ireland Food Consumption Survey (NSIFCS) of adults is the only survey that provides detailed food and nutrient intake data on an all island basis. In 2011 the preliminary results of the National Adults Nutrition Survey (NANS) (n=1500), which provides dietary data for the ROI, were released and included updated information on fruit and vegetable consumption (192 g/d), total fat per cent energy (36.9), dietary fibre (19.2 g) and salt intake not including discretionary salt (7.4 g/d) (50). However overall findings were largely unchanged from the NSIFCS.

Limited data have been generated in NI through small cross sectional studies such as the Young Hearts Study (56). More data are available in the ROI than in NI. Until recently, a representative sample for NI was not included in the FSA National Diet and Nutrition Survey. Initial results from NDND (UK wide) also show little change in dietary patterns in the last decade (35, 36). Table 1.6 summarises the level of achievement of various dietary recommendations across different population groups on the IOI.

Table 1.5: Current mean food and nutrient intakes of populations surveyed on the IOI compared to population target (3)

		Actual mean intake of food/nutrient in the different surveys									
Survey title		**NCFS**	**NTFS**	**NSIFCS**	**NANS**	**Low Income Diet and Nutrition Survey**					
Region		**ROI**	**ROI**	**NI & ROI**	**ROI**	**UK**					
Year of survey		**2003/4**	**2005-6**	**1997/8**	**2008/10**	**2003/5**					
Sample size (n)		**594**	**441**	**1379**	**1500**	**3728**					
Age group (y)		**5-12**	**13-17**	**18-64**	**18-90**	**2-10**	**11-18**	**19-34**	**35-49**	**50-64**	**65+**
Food/Nutrient	**Target****										
Fruits and vegetables (g/d)	>400	208	200	251	192	M 169 F 202	M 145 F 180	M 200 F 209	M 178 F 195	M 257 F 247	M 230 F 234
CHO (% energy)	≥50	52	49	44.3	45.5	M 51 F 51.5	M 50.5 F 50.4	M 48.5 F 50.1	M 47.3 F 48.1	M 48 F 48	M 47.5 F 48.1
Total Fat (% energy)	≤ 35	34	35.6	35.2	36.9	M 35.9 F 35.3	M 36.4 F 36.3	M 36.2 F 34.8	M 36.4 F 35.5	M 35 F 35	M 36 F 35.2
SFA (% energy)	≤ 11%	14.7	14.4	14		M 14.6 F 14.4	M 13.7 F 13.5	M 13.4 F 13.0	M 13.4 F 13.6	M 13.3 F 13.6	M 14.4 F 14.5
PUFA (% energy)	~6.5%	4.9	5.8	7		M 5.3	M 6.1	M 6.0	M 6.2	M 5.7	M 5.7

						F 5.2	F 6.3	F 6.0	F 6.0	F 5.7	F 5.9
MUFA (% energy)	12%	11.6	12.7	12		M 12.0 F 11.9	M 12.8 F 12.7	M 12.7 F 11.9	M 12.7 F 11.9	M 11.8 F 11.5	M 11.6 F 11.1
Added Sugar (NMES)(g/d)	<11%	14.6	12.4	9.3		M 17.0 F 16.7	M 17.2 F 16.3	M 16.2 F 16.3	M 14.8 F 12.6	M 14.5 F 11.6	M 13.1 F 12.1
Fibre or NSP* (g/d)	Adults:18 g NSP or 25g fibre Children: Age + 5g	9.4	11.6	14.8	19.2 (fibre)	M 10.1 F 9.2	M 12.6 F 11.5	M 13.4 F 10.6	M 12.2 F 10.4	M 12.9 F 11.2	M 12.3 F 10.9
Salt (g/d)	<6 Less for children <10y	4.6 (5-6y) 4.3 (7-10y) 6 (11-12y)	6.3	10	7.4	M 5.3 F 5.0	M 7.4 F 6.2	M 8.0 F 5.5	M 7.3 F 5.3	M 7.1 F 5.3	M 6.7 F 5.0

*NCFS – National Children's Food Survey (46), NTFS – National Teens' Food Survey (47), NISFCS – North South Ireland Food Consumption Survey (53); NANS – National Adult Nutrition Survey (50), LINDNS – Low Income National Food and Nutrition Survey (33).

CHO- Carbohydrate; SFA – Saturated Fats, PUFA – Polyunsaturated fats; MUFA – Monounsaturated fats; NMES – Non-milk extrinsic sugars; NSP – Non-starch polysaccharides; M – males; F- females,

** Targets (3) except for Fibre –NSP values given for LINDNS, American Heart Association guidelines for fibre applied in NCFS (57).

Table 1.6: Broad summaries of the achievement (√) and non achievement (x) of dietary recommendations across different population groups on the island of Ireland

	Children (5-12y)	Teenagers (12+y)	Adults
Fruit and vegetables (>400g)	x	x	x
CHO content (>50% energy)	√	x	x
Added Sugar (<10% energy)	x	x	√
Fat content (≤35% energy)	√	x	x
Total PUFA (<6% energy)	√	√	√
MUFA (12% energy)	x	x	x
Fibre (≥18g/d)	x	x	x
Salt (≤ 6g/d)	x	x	X

Note: for data sources please refer to table 5.4.

1.3.3 Consequences of imbalances in dietary intake

Imbalances in dietary intake have many health consequences including excess weight, obesity and increased risk of NCD. With being overweight and/or obese regarded as the 'norm' among adults, coupled with an increasing prevalence among children and adolescents, excess weight has become the most important public health nutrition issue of our time (Table 1.7). Tackling this issue is particularly important given that excess weight is a risk factor for many of the other NCDs.

At an individual level NCDs impact hugely on health and quality of life. Five of the top seven leading risk factors for ill health in Europe, including the IOI, are diet-related and include blood pressure, alcohol, cholesterol, high body mass index, and low fruit and vegetable intake (5). Nutritional imbalances account for over one hundred times more deaths than foodborne communicable diseases (19). Between 30 and 40 per cent of cancers are attributable to diet, physical activity and excess body weight (18). It was estimated that in the EU, 4.4 per cent of disability-adjusted life years (DALYS) are lost due to poor nutrition with an additional 3.7 per cent and 1.4 per cent due to obesity and physical inactivity – a total of 9.6 per cent which is similar to the nine per cent attributed to smoking (58).

Whilst estimates of the impact of the total diet on mortality and morbidity are limited, the WHO has produced estimates of the contribution of individual elements of the diet. For example, the World Health Report 2002 (59) estimates that around four per cent of all disease burden in developed countries is caused by low fruit and vegetable consumption, and that just under 30 per cent of CHD and almost 20 per cent of strokes in developed countries is due to fruit and vegetable consumption levels below 600g per day.

With dietary imbalances having a strong impact on NCD it is not surprising that they have a major economic cost on the IOI (Table 1.7). For obesity alone the direct health costs in the ROI in 2004 were €13.3 million with estimated indirect costs of €4 billion per year (17). In the UK, the costs of excess-weight and obesity (i.e. the treatment of obesity and its consequences) to the National Health Service has been estimated at £1 billion while the total impact on employment may be as much as £10 billion (30).

Table 1.7: Data on overweight and obesity rates of population subgroups on the IOI

Study	Jurisdiction	Age (y) of population	N	Prevalence (% population)			Year of data collection
				Healthy Weight	Overweight	Obese	
North South Ireland Food Consumption Survey (42)	IOI	18-64	1379	34 (Men) 51 (Women)	46 (Men) 33 (Women)	20 (Men) 16 (Women)	1997-1999
Survey of Lifestyles, Attitudes and Nutrition in Ireland (49)	ROI	18+	1207	32 (Men) 44 (Women)	44 (Men) 31 (Women)	16 (Men) 16 (Women)	2006
National Adults Nutrition Survey(50)	ROI	18-64	1274	30 (Men) 47 (Women)	44 (Men) 31 (Women)	26 (Men) 21 (Women)	2008-2010
Low Income Diet and Nutrition Survey (33)	UK including NI	18+	2796	36* (Men) 33* (Women)	35 (Men) 30 (Women)	27 (Men) 33 (Women)	2003-2005
		2-18	932	65	14	21	
Northern Ireland Health and Social Wellbeing Survey (60)	NI	2+	4245	36 (Men) 44(Women) 64 (2-15y)	39 (Men) 31 (Women) 18 (2=15y)	25 (Men) 23(Women) 18(2=15y)	2005-2006

National Teens' Food Survey (47)	ROI	13-17	441	51 (Boys) 82 (Girls)	11 (Boys) 11 (Girls)	8 (Boys) 6 (Girls)	2005-2006
Young Hearts Study (56)	NI	22	489	63*	31	4 Males; 8 Females	1989-1990
National Children's Food Survey (46)	ROI	5-12	594	80 (Boys) 77(Girls)	12 (Boys) 9 (Girls)	8 (Boys) 4 (Girls)	2003-2004
Growing Up in Ireland (61)	ROI	9	8500	74	17 (Boys) 22 (Girls)	6 (Boys) 8 (Girls)	2007-2008

* Does not take into account underweight individuals

1.3.4 Key dietary behaviours of public health concern

An overview of the main diseases that are strongly influenced by diet is shown in Appendix A. Maintaining a healthy weight has a major beneficial effect on protecting individuals from many NCDs. A number of common dietary-related factors and behaviours are associated with a variety of the NCDs. These include the daily inclusion of 400g fruit and vegetables and other fibre-rich foods such as whole grains and oily fish. Selecting appropriate portion sizes and low energy-dense foods (i.e. low in fat and calories) is also vital for good health. Choosing mostly plant-based foods supports a lower energy dense diet and a more favourable balance in terms of fatty acid content in the diet. Choosing fewer processed foods or processed foods with a low salt content is a key behaviour for CVD and certain cancers. In addition to the types of foods chosen, the timing and frequency of consumption of sugary and acidic foods is particularly important for dental health. Eating outside of the home can have an impact on nutritional intake as this food is higher in fat and thus more energy-dense (62, 63).

The data in Table 1.7 clearly demonstrate that two out of three adults and one in every three children and teenagers are carrying excess weight. There are a number of key dietary behaviours associated with weight gain including overconsumption of energy-dense micronutrient-poor foods, large portion sizes, low fibre intake and consumption of sweetened beverages (5). When reviewing the dietary surveys, these dietary behaviours are prevalent among many population groups.

Dietary studies have found that the IOI population has a high intake of energy-dense micronutrient-poor foods. For example, NCFS shows that 18 per cent of children's energy and 15 per cent of teenagers' energy was from confectionery, snacks and biscuits, while 21 per cent of children's fat intake and 18 per cent of teenagers' fat intake was from confectionery, snacks and biscuits (46, 47). The recent SLÁN survey among adults showed consumption of almost four portions a day of foods that are classed as energy-dense, micronutrient-poor (64).

On the IOI, analysis of the NSIFCS (65) and the NCFS (66) have indicated that large portion sizes across many food groups is a key factor associated with obesity. This indicates that most people eat the same range of foods but those with excess weight eat more amounts of these foods that lead to energy intakes greater than energy requirements.

Among adults on the IOI, 77 per cent of the population have fibre intakes (most specifically NSP) below the recommended level of 18g/d (67). The recent NANS data indicated that this has remained unchanged, with 81 per cent of 18-64 year olds and 80 per cent of those over 65 not meeting current recommendations (50). Similarly, low fibre intakes have been found among children and teenagers (46, 47). Foods that contain fibre include fruits and vegetables and wholegrain varieties of cereal-based foods like bread and breakfast cereals. As indicated in Table 1.5, fruit and vegetable intakes across all population groups are well below the recommended levels. Where the consumption of wholegrain cereal foods has been investigated it has been found that refined varieties of cereals are consumed more

frequently than wholegrain, for example white bread is consumed more frequently than brown or wholegrain bread (68, 69).

The NCFS and the National Teen Food Survey showed that 40 per cent of Irish children[1] (aged 5-12 years) and 56 per cent of Irish adolescents[2] (13-17 years) have fat intakes which exceed recommendations (46, 47). Only six per cent of children and 11 per cent of teenagers have saturated fatty acid intakes within the recommended levels of less than 10 per cent energy. Similarly, high intakes have been noted among other population groups (Table 1.5). The behaviours associated with high fat and saturated fat intake include a low fibre, fruit and vegetable intake, and a high intake of energy-dense, micronutrient-poor foods. Dairy products and meat and meat products are the major sources of fat in diets on the IOI along with energy-dense, micronutrient-poor foods like confectionary, cakes and biscuits (25, 42, 46, 47, 56, 70). For example, among children aged five to 12 years, meat and meat products contributed to 19 per cent and dairy foods to 21 per cent of the total fat intakes of primary school aged children. The majority of meat consumed by all age groups is processed rather than lean cuts. School-aged children in the ROI are consuming almost twice as many processed meats such as sausages and coated meats when compared with leaner cuts of fresh meat (68). Most of the milk, cheese and yoghurt eaten are higher 'full fat' varieties (25, 42, 46, 47, 56, 70).

Natural sugars found in fruit, vegetables and milk are not of public health concern. However, added sugars are of concern due to their role in dental caries (frequency of consumption, and intake within a sticky matrix) and a probable role for non-nutritive calories in the development of excess weight and obesity (5). In the ROI and the UK, the dietary recommendation for sugar (as recommended by the WHO) is that no more than 10 per cent energy be from non-milk extrinsic sugars. In the ROI, 24 per cent of children's mean daily energy intake is from sugar with 14.6 per cent from added sugars. Twenty per cent of teenagers' energy is from sugar with 14.6 per cent from added sugar (71). It was shown that 'high consumption of added sugars is associated with a decrease in micronutrient density of the diet and increased prevalence of dietary inadequacies in both children and teenagers' in the ROI (71). As discussed above, confectionary, biscuits and cakes are over-consumed on the IOI and are major contributors to added sugar intake.

There is a high intake of dietary salt across all population groups [Table 1.5, (72, 73)]. The major source is from salt added to food at the manufacturing stage (74). From a behavioural perspective, a reduction in salt consumption will require choosing processed foods with lower salt contents and consuming fewer processed foods.

Nutritional issues for specific population groups

Intakes of a number of specific micronutrients are low among specific population groups, for example inadequate iron intake in females and low calcium intakes in children and young adults (33, 42, 46, 47, 49). In targeting specific groups with nutrition messages, these micronutrients need to be considered (Table 1.8). Recently in the ROI and the UK, folate for women of childbearing age and Vitamin D for babies and infants has received attention at a policy level.

Table 1.8: Examples of specific nutrient focus for different population groups where intakes have been found to be low

Population group	Specific nutritional focus
Pregnancy	Folate (up to 12 weeks pregnancy), avoidance of high intake of Vitamin A, adequate iron, calcium and Vitamin D intake
Breastfeeding	Encourage greater uptake. Health benefits for both mother and baby.
Weaning to 12 months	Adequate iron, Vitamin C, Vitamin D and low salt diet
Children 1-4 years	Iron, adequate fibre and fluid intake
Children	Iron
Teenagers	Iron and calcium; folate for female teenagers
Female Adults 18-50yr	Folate, iron and calcium
Female adults 50yr+	Calcium and Vitamin D
Older adults	Vitamins B12, D

1.3.5 Food poverty

The focus of this chapter is on food behaviours associated with poor nutritional health. As outlined in the introductory section, socio-economic status is a major influence on food behaviour. As a result, food poverty has become a key focus of the work of *safe*food. One of the major gaps identified in the nutrition field is the lack of a co-ordinated approach to address inequalities in access to food and nutrition. Individuals experiencing food poverty are those who have a nutritionally poor diet and do not have access to sufficient food necessary for a healthy diet. As there is no definition of food poverty on the IOI, for the purposes of this report it is defined as the "inability to access a nutritionally adequate diet and the related impacts on health, culture and social participation "(45). In NI and the ROI, food poverty is usually measured using a deprivation indicator, such as the inability to afford meat or equivalent every second day. On an IOI basis, data exist on the extent and nature of inequalities in food and nutrition and the policy background in both jurisdictions (32, 45). In NI, ~20 per cent of the population were living in poverty in 2009 (75). People with disabilities, the youngest groups of households and women are identified as most at risk (32). In ROI in 2005, 14.1 per cent of the population were at risk of poverty and 5.5 per cent of the population were living in consistent poverty (76). Although the major determinant of food poverty is finance, it is a complex issue that incorporates education, transport, literacy, culture and environmental planning. Therefore, food poverty is an outcome of broader determinants of health, including poor housing, social exclusion and high crime (32, 45). A co-ordinated approach is required to tackle food poverty from government through to community level (32, 45).

1.4 Conclusions

On the IOI over the past 150 years, the population's nutrition status has changed from being largely undernourished to a norm of overconsumption. During the same period there has been a growing evidence base regarding the relationship between diet and disease. In response to this evidence, since 1990 there have been significant developments on the IOI in relation to research, policy and infrastructure to promote better nutritional health among consumers on the IOI. However, on the IOI major public health nutrition issues, particularly obesity and related non-communicable diseases such heart disease, diabetes and cancer are widespread. Survey data also show that the diets of both children and adults are often far from ideal with excessive intakes of fat and salt and inadequate intakes of fruit, vegetables and fibre. Those at risk of food poverty may be particularly vulnerable to poor diets.

Recommendations for research and communications for nutrition related behaviour can be found at the end of Chapter 3 (Section 3.6).

2 Factors affecting nutrition behaviour on the island of Ireland

Key findings

- Data on influences on food choice on the IOI is mainly limited to data on knowledge, attitudes and perceptions of healthy eating and nutrition issues.

Knowledge

- Surveys show that approximately half of respondents were able to list key attributes of healthy eating.
- Women, those in high socio-economic groups and with higher education levels, demonstrated better nutrition knowledge.

Attitudes

- A high proportion of consumers indicated general concern about nutrition issues when prompted but very low proportions of consumers spontaneously mentioned nutrition issues when asked to list their main food concerns.
- Body weight concerns were a key issue for teenagers, and particularly for girls.

Perceptions

- There was widespread misperception of children's body weight status among parents. Women judged their own weight status more accurately than their children's and also judged their own weight status more accurately than men.

Influences and barriers

- Self-reported influences on food choice included quality and freshness, taste, family preferences, trying to eat healthily, price, habit and body weight. These influences vary by age, socio-economic status, gender and level of education.
- Among adults and older individuals, the main perceived barriers to change included a reluctance to give up favourite foods, willpower, a busy lifestyle, price, irregular working hours and the widespread availability of 'treat' foods.
- A major additional barrier may be that approximately half of consumers did not perceive any need to change.
- Certain subgroups displayed specific attitudinal barriers, for example, women from lower socio-economic groups expressed health fatalism.
- For children, a perception that healthy food does not taste good was an important barrier.

2.1 Introduction

The many influences on food behaviour were explored in the introduction to the consumer focused review (CFR). In this chapter, the data available for the IOI on nutrition-related food behaviour are outlined. This will allow researchers, practitioners and policy makers to both identify research gaps where inadequate information is available, and to better target key messages where there is evidence that certain groups may be most in need of intervention. While the influences of food behaviour are multi-factorial and are derived from the wider environment, social situation and personal factors, much of the research conducted on the island relates only to knowledge, attitudes and perceptions of healthy eating and nutrition issues. This is reflected in the focus of the chapter.

Surveys and published papers from the IOI are described and summarised in Tables 2.1 and 2.2. Some of the surveys were carried out on an all-island basis, while others were conducted in either jurisdiction. The sampling frames, timing and methods also varied between studies making direct comparisons difficult. While there is an attempt here to draw conclusions and make recommendations based on the available information, it must be borne in mind that caution should be applied to interpretations and that findings from one jurisdiction may not apply in another.

Table 2.1: Adult food behaviour nutrition surveys conducted between 1995 and 2009

Study	*Organisation/Author*	*N*	*Location*	*Sampling*	*Methodology*	*Year*	*Description*
A pan-EU[1]survey of Consumer Attitudes to Food, Nutrition and Health.	Institute of European Food Studies Several publications from Kearney *et al.* relate to this survey (4, 77-80).	14,331 EU adults aged 15+ years, ~1000 from ROI[2].	ROI	Quota controlled sampling in each member state.	Face-to-face questionnaire.	1995-1996	Survey of influences on food choice, sources of nutrition information, definitions of healthy eating, perceived barriers and benefits of healthy eating, stages of change.
North South Food Consumption Survey.	Irish University Nutrition Alliance (42, 81).	1,379 adults aged 18-64 years.	IOI[3]	Random selection using the electoral register as the sampling frame. Survey sample was representative of	Study included 7 day weighed records (body composition) and self-administered questionnaires on food attitudes, employment status, social and	1997-1999	Food consumption survey with limited attitudinal data collected by self-administered questionnaire investigated habitual food and beverage

[1] EU = European Union

[2] ROI = Republic of Ireland

[3] IOI = Island of Ireland

				the population on the IOI with respect to age, gender, geographical location, marital status, social class and socio-economic group.	demographic variables, lifestyle factors, habitual activity, health status, etc.		consumption, lifestyle, health indicators and attitudes to food and health.
Eating for Health?	Health Promotion Agency (82)	1,094 adults aged 18-75 years	NI[4]	A random sample of 2,050 addresses was drawn for each of three regions: Belfast, East NI, West NI.	All members of the household who were eligible were asked to complete an interview using a hand-held computer device.	1999	Survey of current eating patterns, reported food intake, the factors influencing food choices, public knowledge of current nutritional attitudes to healthy eating.
Attitudes of older EU adults to diet,	HealthSense 5th	6,532 EU adults aged 55 years+ of which	ROI	A random route procedure was	Face-to-face interviews	2001	Survey of influences on food choice, assessment

[4] NI = Northern Ireland

food and health: a pan-EU survey	Framework programme. Allen and Newsholme (83)	406 were from the ROI.		used to meet quota requirements.			of attitudes to food and nutrition and health among older adults.
Safetrak	***safe*food** (84)	~800 participants aged 15-74 years (500 ROI and 300 NI).	IOI	Quota sampling	Face-to-face interviews in participants' homes.	2005-2009Initially on a bi-annual basis and later annually.	Quantitative surveys of consumer knowledge, attitudes and behaviours relating to both food safety and nutrition.
Consumer Attitudes to Food Standards	Food Standards Agency (FSA) (85)	712 aged 16 years+	NI	Random location sampling was used to select a representative sample based on gender, age, SES, ethnicity, working and marital status.	Face-to-face interviews using CAPI[5] technologies (approx 30 minutes).	2006	Survey of shopping habits, eating habits, understanding and use of food labels, food safety concerns and sources of food safety information.

[5] CAPI = Computer Assisted Personal Interviewing

Food and nutrient intake and attitudes among disadvantaged groups on the IOI.	Kearney *et al.* (86)	221 disadvantaged women and 74 advantaged women aged 18–35 years participated in the quantitative survey. A total of 74 individuals participated in 12 focus groups.	Dublin and NI	Disadvantaged women were recruited from 20 locations including community groups, crèches, health centres and public agencies. Advantaged women were drawn from commercial companies, colleges and social clubs.	Quantitative survey – participants completed the questionnaires in the presence of an investigator in a group setting. Twelve focus groups were conducted, seven in NI and five in the ROI.	2006-2007	A quantitative survey of food intake, lifestyle, stage of change and attitudes to food and nutrition.
Food choice and health across the life course: a qualitative study examining food choice in older	Delaney and McCarthy (87)	32 participants aged 61-79 years.	ROI	Participants were recruited from a larger health study on older people taking place in the South	Health screening sessions and questionnaire study. In-home telephone interview technique used to capture	2009	Qualitative research to gain insight into key contextual influences on food choice patterns in older Irish adults of varied health status who have

Irish adults				West of Ireland. Recruitment based on gender, body mass index and urban/rural residence	information on diet and food choice. Follow up interviews were conducted.		lived through much socio-economic change.
Quarterly public attitudes tracker	FSA (88)	2,111 adults in the UK aged 16 years+	UK	Random location sampling in order to gain anationally representative sample.	The FSA places questions on the TNS[6] consumer face-to-face omnibus survey on a quarterly basis in order to monitor key FSA issues. Tracking began in 2001.	Data reported from 2010	The questions cover awareness of the FSA, attitude towards food safety and nutrition issues, concern about specific food issues, confidence in all organisations, and in the FSA specifically.

Table 2.2: Children's food behaviour-related nutrition surveys conducted between 2003 and 2007

Study	*Organisation/Author*	*N*	*Location*	*Sampling*	*Methodology*	*Year*	*Description*

[6] TNS = Consumer face-to-face omnibus survey

National Children's Food Survey	Irish Universities Nutrition Alliance (IUNA) (46)	596 children aged 5-12	ROI	A representative national sample was recruited in the primary school setting. Schools were chosen according to urban/rural location, gender mix, size and whether disadvantaged or not. The children were randomly selected within schools.	Food consumption survey using semi-weighed records, measurements of weight and height and self-administered questionnaires.	2003-2004	Food consumption survey with limited attitudinal data including perceptions of body weight for both parents and older children
It's good to talk: children's views on food and nutrition.	McKinley *et al. (89)*	106 Children aged 11-12	NI and Great Britain	Purposeful in school setting. Children were chosen based on demographic, socio-economic and ethnic backgrounds and different	Qualitative research using 11 schools. Two focus group sessions were held in each of the schools. Participation was	2005	Qualitative study to investigate children's views on food and nutrition.

				academic abilities.	voluntary and consent was obtained from the parents.		
National Teens' Food Survey	IUNA (47)	441 teenagers aged 13-17	ROI	A representative national sample was recruited in the secondary school setting. Thirty two schools were randomly chosen according to urban/rural location, gender mix, size and whether disadvantaged. The teenagers were randomly selected within schools.	Food consumption survey using seven day food diary and semi-weighed records, measurements of weight and height, and self-administered questionnaires.	2005-2006	Food consumption survey with limited attitudinal data including perceptions of body weight for parents and teenagers.
Top shelf foods and drinks: Female	Collins and McCarthy (90)	1,478 participants of which 958	ROI	Six schools participated in the study: two rural, one	Self-reporting by students of frequency of	2005	Quantitative study to investigate female adolescents' food

adolescents' eating motives, constraints and behaviours during the school day.		were females aged 13-18 years old.		city centre, two suburban and one was located in the suburban/rural boundary. Three were of mixed gender and three were female only.	consumption of "top shelf foods and drinks". Parental questionnaires as well as school questionnaires. Study carried out over a five day period.		choice motives, constraints and behaviours over the course of the school day.
Food safety education: a cross-border, comparative study of food risk perception in post-primary schools and the development of a model for implementing effective	Share *et al.* (91)	397 14-17 year old children and their parents (237)	IOI	Purposeful sampling in 10 second-level schools (5 in NI and 5 in the ROI).	Quantitative study: students completed the questionnaires in the classroom in the presence of a teacher. Parental questionnaire were self-administered at home.	2007	Quantitative study of food risk perception, food choice, knowledge and attitudes to food safety and nutrition among young people

curricular change.							
Adolescents' views of food and eating: Identifying barriers to healthy eating	Stevenson *et al.* (92)	73 participants aged 12-15 years, with 5–8 individuals per group	IOI	Purposeful sampling from a range of socio-economic groups and rural/urban locations via second level schools in the ROI and in NI.	Qualitative research involving 12 focus group discussions of single-sex groups of boys or girls. Parental consent was obtained.	2007	Qualitative study using thematic analysis to identify key perceptions of and influences on healthy eating behaviour.

2.2 Consumer knowledge of diet and health

2.2.1 Knowledge about healthy eating

This section explores the level of knowledge among the public on the IOI with regard to healthy eating and nutrition issues. The key healthy eating guidelines are communicated slightly differently in the ROI and NI but essentially include the following:

- Eat the right amount to be a healthy weight
- Eat a variety of foods (according to the EatWell plate or Food Pyramid).
- Choose plenty of fruit and vegetables.
- Eat plenty of starchy foods, such as bread, rice, potatoes and pasta wholegrain varieties wherever possible
- Include some milk, cheese and yoghurt
- Eat some meat, fish, eggs, beans and other non-dairy sources of protein
- Minimise foods and drinks high in fat, particularly saturated fat, and/or sugar
- Choose options that are lower in fat, salt and sugar.

Two similar studies carried out, one in NI (82) and another in the ROI (4) asked participants to describe healthy eating in their own words (see Table 2.1 for a brief overview) (4, 82). Relatively large proportions of the participants were able to identify key features of healthy eating. In the ROI study, 39 per cent mentioned less fat, 57 per cent mentioned more fruit and vegetables, 28 per cent listed balance and variety, 18 per cent mentioned less red meat/more chicken/fish and 13 per cent mentioned fresh natural food (4). Compared to the ROI survey, larger proportions of respondents in NI were able to mention key features of a healthy diet but respondents listed similar attributes. More than half (54%) of those asked mentioned cutting down on fried or fatty foods, 51 per cent said eating plenty of fruit, vegetables and salad and 25 per cent stated that the term 'healthy eating' meant eating plenty of fibre or cutting down on sugar, cakes and confectionary (82).

While the level of knowledge displayed is promising, with approximately half of the participants being able to list key attributes of healthy eating, there certainly appears to be a need to continue to promote basic healthy eating messages. This is supported by findings on specific nutrition recommendations from ***safe***food's regular market research survey 'Safetrak' (see Table 2.1 for details) (84).

In 2004, the Safetrak survey examined consumer knowledge of fat, salt and calorie intake on the IOI. The results showed that a high proportion of consumers on the island had a limited knowledge of healthy eating recommendations or were confused about healthy eating. In 2007, quantitative and qualitative research commissioned by ***safe***food on consumers' knowledge and attitudes with respect to nutrition of fruit and vegetables on the IOI reported that just under half of consumers were aware of the Five-a-Day message and fruit and vegetable portion sizes was an area of confusion (93). The surveys conducted in 2005 and 2006 showed that 45 per cent of consumers on the island admitted that they were confused by healthy eating. However, on a positive note 46 per cent also reported becoming more aware of healthy eating issues and approximately one in eight consumers wanted to know more about fat, salt, obesity and weight gain.

2.2.2 Factors associated with knowledge of healthy eating

'Eating for Health?' from NI is the only survey that has examined how demographic and socio-economic factors related to knowledge of healthy eating. Women were more likely than men to mention key attributes of healthy eating; 'reduce fat intake' (57% versus 50%), 'eat more fruit and vegetables' (55% versus 45%) and 'reduce sugar intake' (29% versus 20%) (82). Differences between age groups were also apparent with the youngest age group more likely than the oldest age group to describe healthy eating as 'eating more fruit and vegetables' (55% versus 46%). Similarly, people from households with children under 18 years were more likely to mention 'eating more fruit and vegetables' than adults living alone (55% versus 46%). Adults from the non-manual group were more likely to identify healthy eating as 'reduced fat intake' (59%), 'reduced sugar intake' (27%) and 'eat plenty of fibre' (29%) than those from the manual group (50%, 23% and 20%, respectively). Eating plenty of fibre was more likely to be mentioned as a definition of healthy eating by adults from a high income household (31%) than those with lower household incomes.

The research identified associations between gender and socio-economic circumstances and the number of definitions provided for the term 'healthy eating'. More women (38%) than men (26%) provided three or more terms. A higher proportion of adults from the non-manual group (40%) or high income households (40%) gave three or more definitions compared to those from the manual group (26%) or low income households (28%) (82).

These data show that certain groups such as men and those in lower socio-economic groups, may be key target groups for interventions to improve nutrition knowledge, which must precede behaviour change.

2.2.3 Children's knowledge about healthy eating

The data presented in Volume 2, Chapter 1 indicate that for many children the quality of their diet is poor. Little is known about the relationship between knowledge of healthy eating and food intake in children. One qualitative study by McKinley *et al.* (2005) has examined nutrition knowledge among a group of NI children (89). The authors captured the view of children in NI about food and nutrition through eleven focus groups with a total of 106 children (11-12 years of age) (see Table 2.2 for study details). The authors found that among children the term 'healthy eating' was almost invariably associated with fruit, vegetables and salads. A minority also mentioned milk and wholemeal bread. Furthermore, healthy eating was often perceived to be part of a healthy lifestyle 'package' that included physical activity (89).

All the focus group participants were able to identify ways to improve their healthy eating habits including reducing fat intake, eating more fruit and vegetables, cutting down on sweet, fatty and salty food and eating a variety and balance of foods. These included:

"Grill instead of frying"

"Stop eating out of the chippy"

"Eat more fruit and vegetables"

"Have only chocolate and sweets at the weekend and have healthier foods during the week"

"Whenever I go to dinners every day basically I get chips and sausages and that there's not good for you, so get more variety of stuff, not just the same thing every day".

The level of knowledge among children was encouraging and may reflect the high level of formal nutrition education in primary schools in NI and the development of a healthy schools ethos. Further research is needed to assess children's level of knowledge among representative populations and how this influences food behaviour.

2.2.4 Sources of nutrition information

Only the ROI survey by Kearney and Gibney (1996) provides insight on sources of information on healthy eating (4). The main sources are illustrated in Table 2.3 below. These included TV/radio and newspapers, followed by magazines, health professionals, family and friends, books, advertising, school/college and food packaging. Less than 10 per cent of participants mentioned supermarkets, leaflets in clinics, government agencies, health food shops and consumer organisations. One third of participants said that they frequently looked for healthy eating information.

Table 2.3: Source of nutrition information

Source of information	Percentage (%)
Television	23
Radio	23
Magazines	20
Health professionals	18
Family and friends	16
Books	13
Advertising	12
School/College	12
Food packaging	11

Although useful, these data were collected for the IEFS study in the mid 1990s. Since then there has been a significant change in the way that we communicate, including the use of the internet. More recent data on sources of information have been collected as part of the work for the report. This and further information on internet usage is available in Chapter 3. ***safe***food has also recently investigated attitudes to using social media for healthy eating information. A representative sample of 2,041 participants from the IOI aged 15 plus were interviewed face-to-face, during an in-home survey. 29 per cent of social media users in the ROI would regularly or occasionally share healthy eating information on social media. 16 per cent would do so in NI. Of all those surveyed, whether they currently use social media or not, 13 per cent in the ROI and six per cent in NI said they would be interested in joining conversations on healthy eating. These

results indicate that there is potential to use social media to communicate messages on healthy eating on the IOI (94).

2.2.5 Key nutritional concerns on the island of Ireland

Between 2005 and 2009, participants in the Safetrak survey carried out on the IOI were asked how concerned they were about healthy eating and drinking. Approximately two thirds of consumers said they were concerned or very concerned (Table 2.4). The proportion of those who are concerned has increased gradually between 2005 and 2008 (58% to 71%) (84).

In 2004 and 2005, consumers were asked if they were concerned about a number of important food issues including salt, fat, sugar and cholesterol and key public health issues such as obesity. The results are shown in Figure 2.1 and indicate that levels of concern vary from year to year but, in general, between one third and half of consumers are concerned about these issues, with fat content of greatest concern (51% in 2004 and 42% in 2005).

From 2007 to 2010, participants in the Safetrak survey were asked to spontaneously list their food concerns. Food safety issues scored more highly than nutrition issues, with fat/saturated fat and salt mentioned as key nutritional concerns (Figure 2.2). Apart from fat content, the proportion of participants that mentioned nutrition issues spontaneously was low. Obesity was not mentioned at all, however the most recent survey showed an increase in concern regarding heart health issues. The general low level of spontaneously expressed concern is contradictory to the high proportions expressing general concern about healthy eating when prompted.

Table 2.4: Consumers' attitudes to healthy eating and drinking (prompted)

	Safetrak 5[1] Aug 05	Safetrak 6[2] April 06	Safetrak 7[3] Sept 06	Safetrak 8[4] Mar 07	Safetrak 9[5] Nov 07	Safetrak 10[6] Dec 08
...very concerned	18%	24%	24%	28%	31%	34%
...quite concerned	40%	41%	40%	44%	45%	37%
...neither (un)concerned	26%	20%	18%	22%	13%	15%
...not very concerned	7%	6%	10%	3%	6%	6%
...not at all concerned	8%	6%	6%	2%	4%	4%

[1]Base value (n) was 816

[2]Base value (n) was 831

[3]Base value (n) was 803

[4]Base value (n) was 814

[5]Base value (n) was 796

[6]Base value (n) was 805

Figure 2.1: Consumer nutrition concerns (prompted) (adapted from *safe*food Safetrak data)

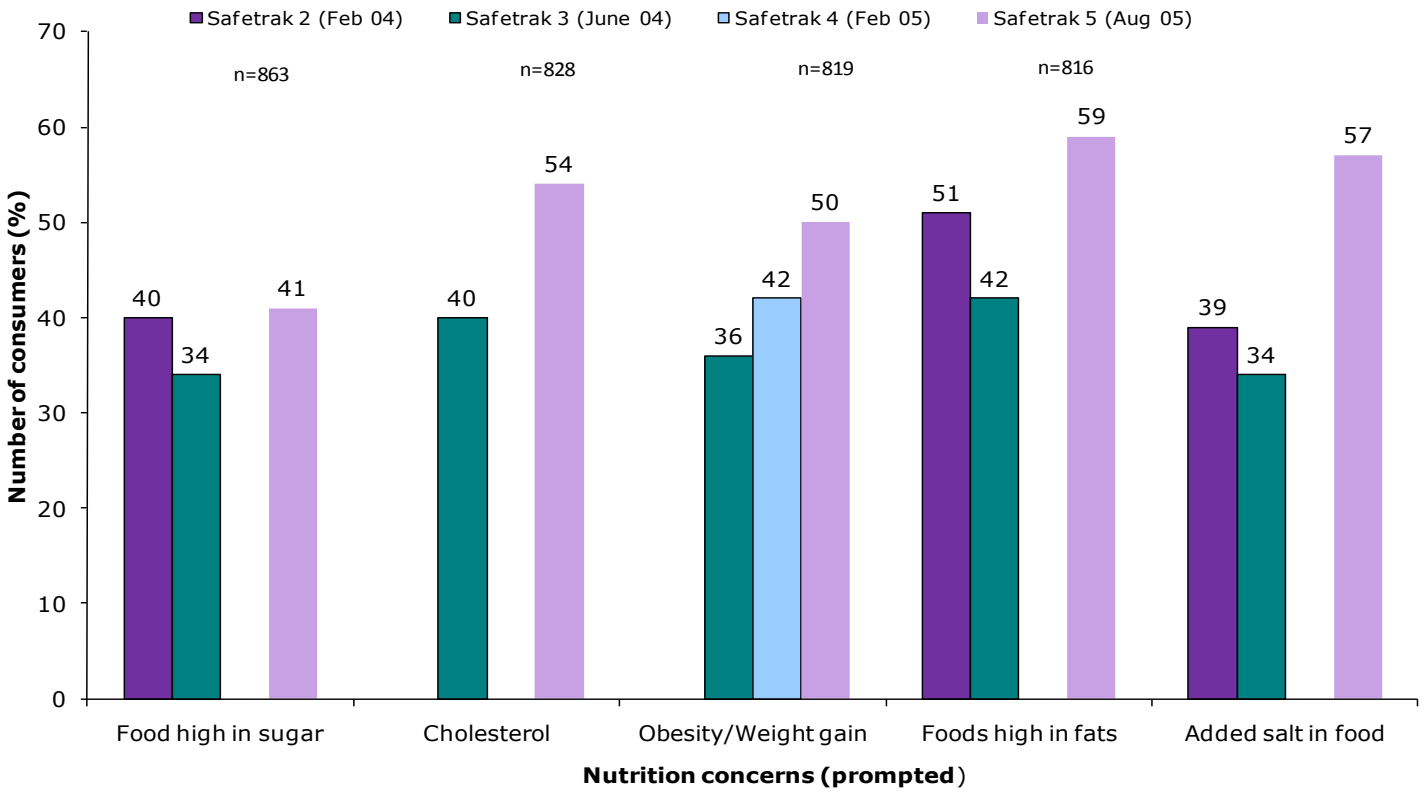
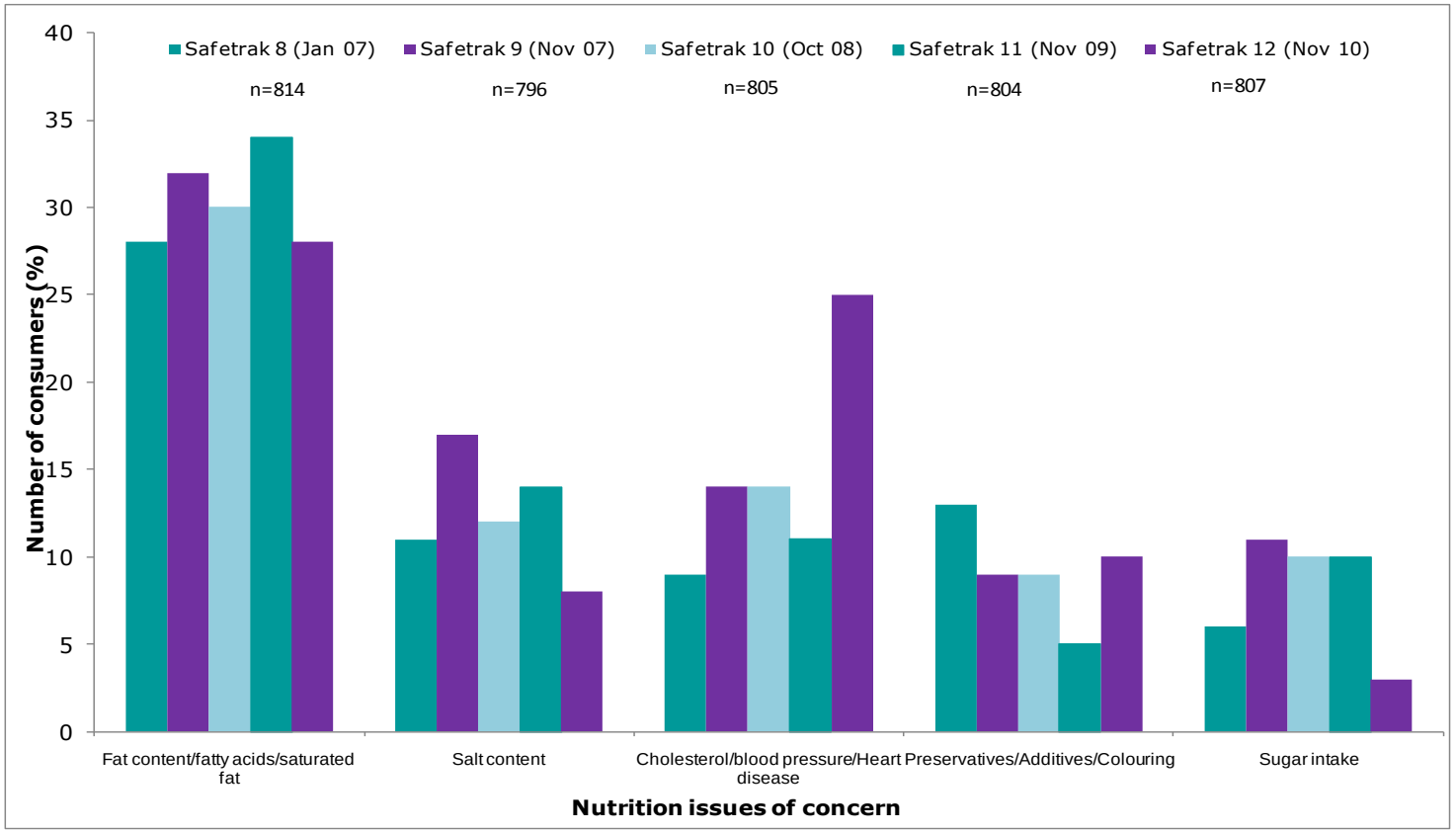


Figure 2.2: Nutrition issue of concern (adapted from Safetrak data)



2.2.6 Food concerns among NI consumers

Data on attitudes to food and nutrition are available for NI adults from 2006 from the Food Standards Agency's (FSA) annual survey of consumer attitudes (85). The results showed that healthy eating was a key concern for consumers in NI (23% concerned) and it was as important as the provision of health services (24%) or house prices (23%). Only 11 per cent felt that healthy eating was not important.

When consumers were asked to spontaneously list the food concerns that came to mind, no single food concern related to healthy eating was mentioned by more than one in ten people. Like the ROI study, this may indicate that there is no 'top of mind' single food issue for consumers. Just over a third of consumers in NI (37%) spontaneously mentioned any concern at all. Women were more likely to express a concern than men (women 42%, men 33%); the oldest age band (age 66 years+) were less likely to do so (21%) than almost every other age group and higher social grade groups were more likely to be concerned than those from lower social grade groups. (AB[7]s 56%, C1C2[8]s 41%, DE[9]s 25%).

In terms of nutrition issues, salt was spontaneously mentioned as a concern by six per cent of people, unhealthy diets for children by four per cent and fat and sugar content by three per cent, respectively. The values were far higher for prompted concerns (i.e. when participants were asked to express their level of concern when presented with a list of food issues), with high levels of concern in relation to the amount of salt (55%), fat (48%) and sugar (42%) in food for consumers.

2.2.7 Comparison of public concerns with the UK

Data from the UK indicate comparability of food concerns between NI and Great Britain. The FSA places a number of questions on the Taylor Nelson Sofres (TNS) consumer face-to-face omnibus survey on a quarterly basis in order to monitor key food issues. The results presented here are from the March 2010 survey with a representative sample of 2,111 adults in the UK (88). The main nutritional issues of concern for respondents were the amount of salt (44%), fat (413%), sugar (38%) and saturated fat (38%).

While high proportions of consumers expressed general concern about nutritional issues when asked, food safety issues tended to score higher in terms of concern, whereas nutrition issues were not top of mind (unprompted). These findings may give some validity to the psychometric model where risks that have long-

[7] AB = Upper middle class and middle class (higher/intermediate managerial, administrative or professional).

[8] C1C2 = Mixture of upper and middle class that are skilled working class (supervisory, clerical or junior management).

[9] DE = Working class, semi- and un-skilled manual workers (casual or lowest grade workers, pensioners and others who depend on welfare state for income).

term consequences and that are in the control of the individual differently to those that have immediate effects, for example food poisoning (95).

2.2.8 Influences on food choice

Two quantitative studies conducted in the ROI asked participants to report influences on food choices. These surveys were the Institute of European Food Studies' (IEFS) pan-EU survey of consumer attitudes in adults and the HealthSense pan-EU survey of older adults (see Table 2.1 for a brief overview) (4, 78, 96). Adults in the ROI (aged 15+ years) most often cited quality or freshness (49%), taste (45%), family preferences (36%), trying to eat healthily (35%), price (30%) and habit (29%) (4). Overall, people in the ROI deemed that the characteristics of the food and personal and social factors were important influences on food choice. Further analysis showed that females, those from older groups, those who had greater education and from a higher socio-economic status were most likely to regard healthy eating as an important influence (78).

Older Irish adults (aged 55 years+) participating in the pan-EU HealthSense study cited 'trying to eat healthily' (45%), habit (26%), taste (21%), family or spouse (18%), body weight (17%) and price (14%) as major influences (Table 2.5) (96). The authors also carried out detailed segmentation analysis of the participants and even within an older age cohort, there were clear differences in perceived influences between demographic groups. Women more so than men were more likely to select 'trying to eat healthier' (48% v 42%) and body weight (20% v 14%) as influences. Men were more likely than women to select taste (26% v 16%) (Table 2.5).

Table 2.5: Self-reported influences on food choice [Institute of European Food Studies] (4)

	55 years +		
Influences	Overall (%)	Women	Men
Trying to eat healthy	45	48	42
Habit	26		
Taste	21	16	26
Family/spouse	18		
Body weight	17	20	14
Price	14		

In the 75 years plus age group, habit and convenience were more often selected as influences, whereas family or spouse influenced the 55-64 years age group. Price was more important for those aged 65-74 years. Those with third-level education more often chose 'trying to eat healthily' and cited weight and family or spouse as influences, while those with primary education chose habit and price. Habit was also more important for rural dwellers compared to urban dwellers and for those living alone. For those who had retired, weight, price and prescribed diet were important while for those who were still working, family/spouse was a stronger influence.

The participants in these studies were presented with lists of influences from which they could select. However, these did not include wider environmental, social and cultural influences. Major gender and age differences were apparent. This was possibly due to cultural conditioning or the differing responsibilities of women and men with regard to food (97). For men, the formation of habit and taste preference seemed to be a key factor, which in turn could be influenced by the family environment and wider environmental influences such as food policy in educational settings in the early years. Higher levels of education and income also appear to promote the importance of healthy eating, which although can be described as personal factors, could be influenced by a host of socio-cultural and economic factors.

In older individuals, a recent qualitative study by Delaney and McCarthy (2009) offers unique insight into the development of eating habits over time (87). The authors used a life course approach to examine the impact of changing life roles, circumstances and broader economic and social change on food choice and perceptions. Food experiences in early life played a key role and habitual food selection was deeply embedded in cultural norms. Changing roles such as parenthood, work and retirement affected food choices,

as did increased affluence and a more varied and readily available food supply. Participants mentioned particularly the availability of 'treat foods' and noted the change in exposure to such foods since childhood. They viewed a traditional diet as healthy and rejected processed foods. Perception of diet as a risk factor for health was low however among these older adults.

2.2.9 Trends in consumer behaviour

Between 2001 and 2009 Bord Bia carried out consumer research that involved 3,000 participants from the ROI, NI and UK (98). Face-to-face, in-home interviews involving adults aged 15+ years in the ROI and aged 16+ years in the UK and NI were conducted. Topics included; food and cooking, speciality food, health and wellbeing, grocery shopping, eating at home, food labelling, organic food, eating out, environment, alcohol, local food and segmentation.

With regard to cooking from scratch, there was a substantial increase in the percentage of participants preparing meals at least a few times a week between 2005 and 2009. In the ROI, 63 per cent of participants reported cooking from scratch in 2009 as opposed to 56 per cent in 2005. In NI, 59 per cent and in the UK 69 per cent of participants cooked from scratch in 2009 whereas in 2005, 44 per cent (NI) and 55 per cent (UK) cooked from scratch. There has been a significant increase in confidence in cooking between 2005 and 2010.

Spending time over dinner as a family was an important event for participants in this study. Since 2005, there has been an increase of 5 per cent for the ROI, 10 per cent for NI and three per cent for the UK in the importance of spending time over dinner as a family. There has been a substantial decline in the use of ready-to-eat foods and preparing traditional family meals. An increase was observed where participants made an extra effort to prepare a special meal.

Although there is an increase in family dining, there is a significant decrease in the amount of people making time for breakfast. Since 2001, there has been a decline by five per cent in the number of people making time for breakfast in the ROI.

2.2.10 Influences and barriers to dietary change

Both the IEFS study and HealthSense study examined influences and barriers to dietary change. The key barriers to healthy eating selected by participants in the IEFS study were; giving up favourite foods (34%), willpower (31%), busy lifestyle (19%) and price (17%) and irregular working hours (17%). Most participants

(55%) were not considering dietary change, ('precontemplation stage') according to the transtheoretical model (99). Men, and those with primary education only, were also more likely to be at this stage of change.

The key barriers for older individuals in the HealthSense study were; giving up foods they liked (28%), (selected more often by men than women, 31% vs 26%), simply not wanting to (24%), feeling confused (22%), the cost of healthy food and the perception that there was no need to change (19%). Older adults who had already changed their diets cited the main motivators as medical reasons (39%), becoming more health conscious (26%), gaining weight easily (20%), difficulties with digestion (23%), becoming less physically active (16%), and having more time to eat healthily (16%). Other reported influences included children leaving home, financial change (14%), retirement (11%) and chewing difficulties (10%). For those who had not tried to change, the vast majority (77%) thought that their diets were already healthy enough. The qualitative study of older individuals by Delaney and McCarthy also identified the widespread availability of 'treat' foods (87).

On a more micro level Collins and McCarthy (2005) (90) have examined influences on the consumption of top-shelf foods by Irish adolescents in the school setting. Pupils completed a survey that examined motives and controls of 'top-shelf foods' intake. The availability of 'top-shelf foods' and motives such as taste, price/value , peer influence/trendy were positively related to intake on top-shelf foods whereas controls such as parental awareness, and motives such as diet/slimming, natural ingredients, health/physique were negatively related to top-shelf food intakes.

These studies both show that major socio-demographic differences in perceived barriers to change are apparent. For many there seems to be a perception that their diet is already healthy and many are not considering change, particularly men and those with lower levels of education. The taste of food or importance of favourite foods appears to be important to all groups. Low perceived self-efficacy, competing time-commitments and cost are also key reported barriers, while medical reasons became more pertinent motivators later in life. For young adults factors such as school policy, parental attitudes and the students' own motives could be addressed in any intervention to change adolescent eating behaviour.

One recent study by Naughton et al. (2010) focused on strategies used by individuals who had already tried to change behaviour. The work was conducted as part of the National Adults Nutrition Study and involved detailed analysis of intentions and behaviours from discourse from 12 in-depth interviews. The participants described three important success factors for behaviour change including planning, coping/control mechanisms and monitoring (100). These three concepts should be considered in the development of behaviour change programmes on the IOI.

2.3 Attitudes to and perception of nutrition, healthy eating and changing dietary behaviour

Early data on attitudes to and perceptions of nutrition and healthy eating among consumers in the ROI come from the study by Kearney and Gibney (1996) at the former IEFS (79). Consumers were asked to assess their own diets by agreeing or disagreeing with the following statement 'I do not need to make changes to the food I eat as it is already healthy enough'. Sixty six per cent either strongly agreed or tended to agree, with more males than females agreeing, and those with primary education only more likely to agree. The researchers also assessed the importance of nutrition to consumers by asking them to agree or disagree with this statement 'I usually do not think of the nutritional aspects of the food I eat'. Fifty five per cent agreed, with those in the age group 35-55 years least likely to agree. These data show that for most survey participants, dietary change was not considered necessary and that nutrition was not a priority when choosing food. The authors also assessed 'stage of change' according to the transtheoretical model (99) with similar results. Most participants were not considering dietary change, with 55 per cent in the 'precontemplation stage'. Men and those with primary education only were also more likely to be at this stage of change.

In a study of perceived need to alter eating habits in the same population 89 per cent of people in the ROI believed that people should eat more fruit and vegetables, 83 per cent said that people should eat less savoury snacks and 68 per cent believed that people should eat less sugar (79). When asked what they thought was the biggest single most important benefit of healthy eating, 24 per cent said to stay healthy, 24 per cent said to prevent disease, 12 per cent said to control weight, nine per cent said for a good quality of life and eight per cent said to be fit (4).

As with all nutrition surveys, there is a risk that the responses captured in the IEFS study were socially desirable responses and it is not possible to tell whether those who reported that their diet was healthy actually did have a healthy diet. These data indicated that at certain time points in life (aged 35-55 years, possibly when raising a family) people may be more conscious of diet and more open to advice. The survey suggests that men and those with a low level of educational attainment may not be open to change, believing that their diets are already healthy. While two thirds of the sample felt that their own diet was healthy enough and did not need to change, they did not have the same optimistic viewpoint of the diets of the rest of the population and believed that people ate too few fruit and vegetables, too many savoury snacks and too much sugar. This shows a degree of optimistic bias, or a tendency to be overly optimistic about one's own situation.

Data from the North-South Ireland Food Consumption (NSIFCS) Survey (101) support some of the findings from the earlier IEFS studies. A majority of participants (62%) said that they made conscious efforts to eat a healthy diet, either most of the time or quite often, while just over half (52%), somewhat less than the IEFS

study (66%), agreed that they did not need to make changes to their diet as it was healthy enough. Participants most likely to make conscious efforts to try to eat a healthy diet were females, older participants (51-64 years) and those with the highest intakes of fruit and vegetables and lowest quartile of energy intake from fat. Two-thirds of the total sample felt they ate too few fruit while one-third felt they ate too few vegetables.

More in-depth analysis was carried out on the same data by Hearty *et al.* (2007), including a comparison with food consumption estimated using a seven-day food diary (81). The authors found that those who perceived their own eating habits to be healthy were more likely to comply with current dietary guidelines than those who did not. The groups most likely to perceive their diet as unhealthy were men, those aged 18–35 years, those from the lowest social class, and those with primary level education only.

Data collected in NI in 2001 showed that many consumers had a positive perception of their own eating habits (82). Those surveyed were asked to consider their own eating habits and to assess how healthy they thought it was. Most adults (77%) stated that their eating pattern was 'fairly healthy'. One in ten (10%) rated their diet as 'very healthy' and one in seven (14%) rated their diet as 'unhealthy'. Rating of eating habits was associated with an individual's demographic and socio-economic circumstances. The authors compared adults' own assessment of their eating habits with their reported daily consumption of fruit and vegetables (as a marker of healthy eating) and chips (as a marker of unhealthy eating). The majority (87%) of those not achieving the recommended daily five portions of fruit and vegetables rated their diet as 'fairly healthy'. Over half (58%) of those who eat no fruit or vegetables on a daily basis said their diet was 'fairly healthy' and a further three per cent of those who eat no fruit and vegetables rated their diet as 'very healthy'. More than half (54%) of those who ate chips most days also rated their diet as 'fairly healthy'. This is somewhat in contrast to the findings from Hearty *et al.* (2007) who found that consumers on the island were able to assess accurately their own diets. However, the criteria in the NI study (chip and fruit and vegetable consumption only) were somewhat limited (81).

2.4 Attitudes to and perceptions of nutrition among population subgroups

2.4.1 Attitudes to nutrition among disadvantaged women

Many of the surveys described in the text so far have shown more negative attitudes to healthy eating among lower socio-economic groups (78, 85). Analysis of data from the North South Food Consumption Survey collected between 1997 and 1999 showed that young, urban women of low socio-economic status had an increased risk of food poverty and micronutrient inadequacy. To investigate the attitudes and behaviours

associated with both food poverty and poor nutritional status, Kearney *et al.* (2008) (86) carried out a survey of disadvantaged women (see Table 2.1).

Two main findings emerged from the quantitative study. Health fatalism, (i.e. a belief that health outcomes are predetermined and governed by external forces such as luck or fate) was more common among disadvantaged women than women of higher economic status. In relation to readiness to change, being in the pre-contemplation stage of dietary change (not considering change) was more prevalent, with action or maintenance stages being less prevalent among disadvantaged participants. These attitudinal profiles were associated with poorer overall dietary habits. The theme of health fatalism and a feeling among disadvantaged women that obesity was inevitable also emerged in a series of 12 focus groups conducted in both NI and the ROI in 2006-2007, as part of the same study.

2.4.2 Attitudes of parents to their children's diets

Little published data are available on parental attitudes in the ROI to children's diets. In NI, the Health Protection Agency's (HPA) survey on attitudes to food and nutrition revealed that half of parents expressed concern about foods aimed at children and a quarter were concerned about the nutritional content of school meals. Almost three-fifths of the parents surveyed also claimed they were trying to reduce the amount of unhealthy foods that their children ate (85). This is supported by recent research by ***safe***food conducted as part of the formative research for Littlesteps, a campaign to encourage families to eat more healthily and become more active, which showed an increase in the percentage of parents reporting making changes to their children's diets (102).

Data on parental attitudes to teenagers' diets are available from a study by Share *et al.* (2007) (91) and more recently from a ***safe***food report on drinks consumption (103). In the study of Share *et al.* (2007), 237 parents of 14 to 17 year old teenagers from both NI and the ROI answered questionnaires including questions about their children's diets. The majority of parents (72%) thought that their child had a healthy diet, 16 per cent reported that they did not and 12 per cent did not know. Parents listed obesity, consumption of fast food or junk food and the consumption of processed foods high in fat, salt and sugar as the main food-related health issues facing young people today. The ***safe***food study, where parents from lower socio-economic groups shared their views in six focus groups, found that while parents encouraged their children to eat healthily, this often proved difficult and many reported losing control over their child's diet when their children reached a certain age (103).

2.4.3 Attitudes to food and nutrition among adolescents

Little published data are available on attitudes to and perceptions of food and nutrition in teenagers on the island. Data from Share *et al.* (2007) (91) conducted with a sample of 397, 14 to 17 year old students in 10 second-level schools (5 in NI and 5 in ROI) showed that students scored highly in relation to concerns about dietary fat, fibre, sugar and salt. It also showed that students in the ROI were more likely than NI students to think about risks to their health from fat, contaminated food, not having enough fibre in their diet, additives and preservatives, sugar, salt, chemicals, consuming a high calorie diet, a high carbohydrate diet and genetically modified foods. In addition, the study revealed gender differences, with girls being more likely than boys to be concerned about risks to their health from certain foods. These included foods that are high in saturated fat, sugar, salt and calories, foods low in dietary fibre, and foods containing additives and preservatives.

Insights into adolescent attitudes to food and health were also captured in a series of 12 focus groups, with a total of 73 participants, published in 2007 (92). The group discussions revealed a social pressure towards thinness as well as a negative attitude towards obesity. Body size was perceived to reflect aspects of the person's character. While thinness was highly valued, weight control behaviours were viewed negatively. This was particularly true for extreme dietary practices such as vomiting, skipping meals, diet pills, using laxatives and commercial diets such as the Atkins diet. For the majority, dieting was perceived as negative unless a person was really overweight and the only acceptable form of dieting was considered to be healthy eating.

For the most part, data from this study showed that for teenagers healthy eating was rarely a goal in its own right, and was generally considered within the context of sensible weight control.

2.4.4 Attitudes to food and nutrition in pre-teens

In 2005, McKinley *et al.* (89) conducted focus groups with pre-teen children (aged 11-12 years) to investigate their views on food and nutrition. A total of 106 children from 11 post-primary schools in NI and England participated in the study (see Table 2.2 for further detail). The research revealed negative attitudes towards healthy eating. The participants felt that healthy food did not taste as good as unhealthy food. This was even the case for food that they had not yet tried, for example, one participant commented 'Organic ice cream – that's probably "minging"'. They also thought that 'junk food' looked more appealing than healthy food.

Children didn't want to risk spending their limited money on healthy food that might not taste good, as articulated in this quote 'Sometimes you can get like bad fruit but you never get like bad chocolate'. They

also felt that it sometimes took too long in their school canteens to queue for healthy foods. Girls were motivated to eat healthily because of body weight concerns, whereas boys were motivated by sport and physical performance. The children expressed a general dislike for being 'preached' to about eating well.

2.5 Obesity and body weight perception

Internationally, there is a growing body of evidence that a large proportion of the population may fail to identify themselves (104) or their children as overweight or obese (105-110). This can happen for a variety of reasons (111) and may constitute an important barrier to dietary change. In the ROI, data from the National Children's Food Survey showed that while mothers were for the most part accurate in assessing their own weight status, the majority of mothers of obese or overweight children thought that their child's weight was 'fine'. Of mothers of obese children, 52 per cent either tended to agree, or strongly agreed, that their child's weight was 'fine' for their age. Further to this, 86 per cent of mothers of overweight children also thought their child's weight was 'fine'. This suggests that parents who are unaware that their child is an unhealthy weight are unlikely to proactively seek out treatment, or to understand that health information relating to obesity is relevant for their child (112).

The National Teens' Food Survey (NTFS) of teenagers in the ROI aged 13 to 17 years revealed misperceptions regarding healthy body weight among teenagers and their parents. 48 per cent of healthy weight teens expressed dissatisfaction with their body weight, whereas 34 per cent of overweight teens were happy with their weight. The majority of obese teens (thirty out of thirty three) wished to lose weight. These results show that normal weight and overweight teens are more likely to have misperceptions than obese teens, who appear to be aware of their weight status. Clear gender differences were apparent. Boys were less likely than girls to wish to be lighter (23% v 60% respectively). This was reflected in dieting behaviour. Girls were twice as likely as boys to have tried to lose weight (51% v 25% respectively).

Among parents, misperceptions of the weight status of their children were apparent. Three quarters of those with overweight children thought that their teenagers' weight was 'fine' indicating that a higher proportion of parents incorrectly perceived the weight status of their teenage children. Healthy weight parents were able to accurately judge their own weight status but 69 percent of overweight fathers thought that their weight was 'fine' and one in five obese fathers though their weight was 'fine'. Mothers were more likely to correctly recognise their own body weight status.

2.6 Conclusions

The conclusions presented here are based on the review of available publications. However attention must be drawn to the limitations of the data, as much of these data is drawn from cross-sectional surveys that offer a snapshot of a sample of the population at a particular period in time. Methods and sampling may therefore not be comparable between studies and all conclusions are made with caution.

Overall, there was a reasonable awareness of what healthy eating means among both adults and children. Large proportions of consumers were able to mention aspects such as 'reduce fat intake', 'eat more fruit and vegetables', 'eat a balanced and varied diet', 'more fibre' and 'less sugar'. However, many people remain unaware of key healthy eating guidelines. Men, or those from manual working groups, had poorer knowledge and may benefit more from intervention.

When prompted, key nutritional concerns included fat, saturated fat, salt content and body weight. However, nutritional concerns were not top of mind for many consumers and were spontaneously mentioned in surveys by only a small proportion of those interviewed. This may reflect the psychometric model where risks with long-term consequences illicit a less acute response compared to those with immediate and perhaps more tangible consequences (95). This represents a key challenge for those working to change nutrition behaviour.

Consumers listed food factors such as freshness and taste, social factors such as family preferences, personal factors such as a desire to eat healthily and habit, and economic factors such as price, as key influencers of food choice. Wider environmental factors were rarely identified or investigated in the research that has been conducted to date.

Barriers to healthy eating on the island included a variety of personal, social and cultural factors; the belief among consumers that their diets are already healthy enough, health fatalism, optimistic bias, taste and a perception that healthy foods taste bad, and the widespread availability of 'treat' foods. Consumers were also challenged by a lack of time and by a feeling that they had low willpower. In relation to obesity specifically, misperception of body weight, particularly among men and among parents of overweight children, may mean that current health promotion efforts to reduce obesity may not appear relevant to important target audiences. Equally, a large proportion of normal weight teenagers believe they need to lose weight. Therefore, addressing body weight misperceptions is an important step in promoting healthy body weights on the island.

Recommendations for research and communications for nutrition-related behaviour can be found in Section 3.6.

3 Influences on diet and healthy eating on the island of Ireland: *safe*food research

Key findings

Knowledge

- Consumer understanding of "healthy eating" included aspects such as having a balanced diet, eating more vegetables, fruit and less fatty food. Only three per cent of consumers spontaneously mentioned "not to overeat".
- Most people (70%) understand that healthy eating provides benefits in terms of staying healthy.
- Television was the leading source of health information for consumers.

Perceived importance of healthy eating

- Sixty one percent of respondents on the IOI (65% in the ROI and 52% in NI) claimed to think about healthy eating when they choose food.
- Those with third level education were more likely to consider the healthiness of the food before purchasing (71%), those aged 15-25 years were less likely to do so (44%).
- Most consumers were concerned about healthy eating with 79 per cent of respondents in the ROI and 71 per cent in NI acknowledging that healthy eating was very important.
- While the Safetrak data indicated that maintaining health was a key motivation for healthy eating, the focus group research showed that in reality most individuals attached less importance to long-term health outcomes compared with short-term outcomes such as mood change or weight loss.

Relevance and meaning of food for consumers

- Food provided many functions that differed by gender; women emphasised meals in the context of feeling full, whereas men conceptualised food as fuel.
- Focus group participants viewed their bodies as vehicles to carry out their daily tasks; going to work, picking up kids, staying well. They did not require their bodies to function at their maximum potential nor did they feel this would be relevant.

Influences on food behaviour

- In addition to consumer knowledge, attitudes and perceptions of healthy eating, the focus group and Safetrak survey revealed several personal factors that influenced the diets of consumers including; life stage and lifestyle, weight control (for women), stage of change, emotional eating, self regulation, optimistic bias and health fatalism.
- Social influences included familial influences such as shared meals, family preferences, family support and childhood conditioning.
- External environmental influences mentioned by participants included time of day, calendar effects, season and climate.

Perceived need to change and dietary change

- Most respondents perceived themselves to be very or quite healthy (87%).
- Approximately one in four consumers surveyed felt that they needed to make changes to their diet. Key dietary changes included eating more fruit and vegetables, less 'treat' foods and reducing fat and salt intakes.
- A large proportion of consumers (43%) had never made any changes to their diet with a view to improving health.

Barriers to healthy eating

- Key barriers to healthy eating included time, food preferences, cost, lack of willpower, and the perceived difficulty of making changes.
- Focus group participants also mentioned cost, time and lifestyle, discussed the ready availability of fast foods and convenience foods, and felt that the food market is weighted against healthy eating.

Potential promoters of dietary change

- Suggestions by consumers for promoting dietary change included changing the food marketplace to facilitate healthy food choices, involvement in sport and regular medical checks.

3.1 Introduction

This chapter presents findings from the qualitative and quantitative research carried out by *safe*food as part of this consumer focused review (CFR) to contribute to our understanding of knowledge, attitudes and behaviours relating to healthy eating on the Island of Ireland (IOI). This research aimed to provide additional up-to-date information on the factors that drive eating behaviour and the barriers to behaviour change. While the data provide some insight into the factors that drive behaviours, the limitations of both qualitative and quantitative research must be borne in mind in extrapolating the findings to the entire population.

3.1.1 Background and methodology

In order to inform this review of consumer behaviour, *safe*food commissioned both quantitative and qualitative research to identify key consumer concerns, attitudes, perceptions and barriers to both food safety (see Volume 1, Chapter 3) and healthy eating. Full details of the methodology used for the quantitative and qualitative research is outlined in Volume 1, Chapter 3. The socio-demographic make-up of the focus group participants is outlined in Table 3.1 below.

Table 3.1: Nutrition focus group composition

Group Number	Location	Gender	Age Group (Years)	Social Class	Life stage/Circumstance
1	Dublin	Female	20-29	C1C2[1]	**Young females** • No children • Non students • Not living at home • Prepare ≥ 3 meals/wk[2]
2	Cork	Male	20-34	C2D[3]	**Young males** • No children • Non students • Not living at home • Prepare ≥ 3 meals/wk
3	Ballina	Male	35-50	C1C2	**Fathers** • At least one child at home • Prepare ≥ 3 meals/wk
4	Limerick	Female	50-65	BC1[4]	**Mothers** • Have grown children that have left home
5	Belfast	Female	30-45	C2D	**Mothers** • At least one child at home
6	Strabane (NI[5])	Male	45-65	C1C2	**Mature Males** • Mix of married and single/ divorced/ separated/ widowed • With and without children

[1]C1C2 = Mixture of upper and middle class that are skilled working class

[2]wk = Week

[3]C2D = Skilled and unskilled working class

[4]BC1 = Upper middle class

[5]NI = Northern Ireland

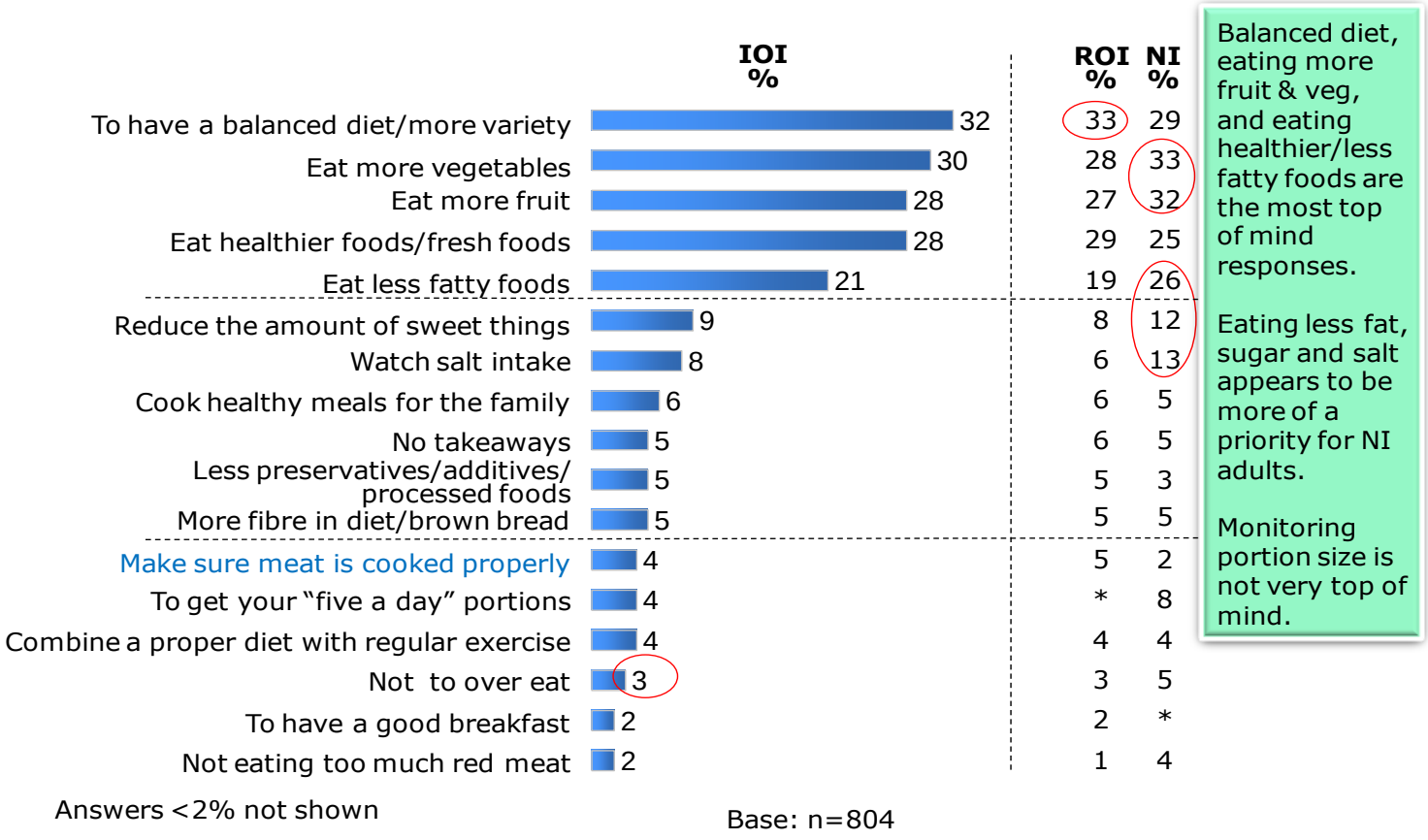
3.2 Influences on diet and healthy eating

The quantitative and qualitative studies provided data on consumer knowledge, attitudes, concerns and perceptions with regard to healthy eating. In addition, the focus groups, in particular, were a rich source of information on other influences including personal, cultural and social factors.

3.2.1 Understanding of healthy eating

Public understanding of "healthy eating" included aspects such as having a balanced diet, eating more vegetables, fruit and healthier and less fatty food (unprompted; Figure 3.1). Despite the high proportion of overweight individuals on the IOI and the strong association with portion size (113), only three per cent of consumers mentioned "not to overeat". This is in contrast to the findings from the focus groups, which showed that women in particular primarily associated healthy eating with weight control (see Section 3.2.6).

Figure 3.1: Understanding of healthy eating (unprompted)



3.2.2 Perceived benefits of healthy eating

The Safetrak data showed that most people understand that healthy eating provides benefits in terms of staying healthy, with 70 per cent of respondents giving this as a motivation. In the ROI, consumers were twice as likely as consumers in NI to suggest the importance of healthy eating to prevent illness (42% compared to 21% respectively), and were more likely to suggest its importance in terms of a good quality of life and to have plenty of energy. However while the Safetrak data indicated that maintaining health was a key motivation for healthy eating, the focus group research showed that in reality most individuals continually attached diminished importance to long-term health outcomes when compared with short-term outcomes such as mood change or weight loss (see Section 3.4.2).

3.2.3 Sources and importance of health information

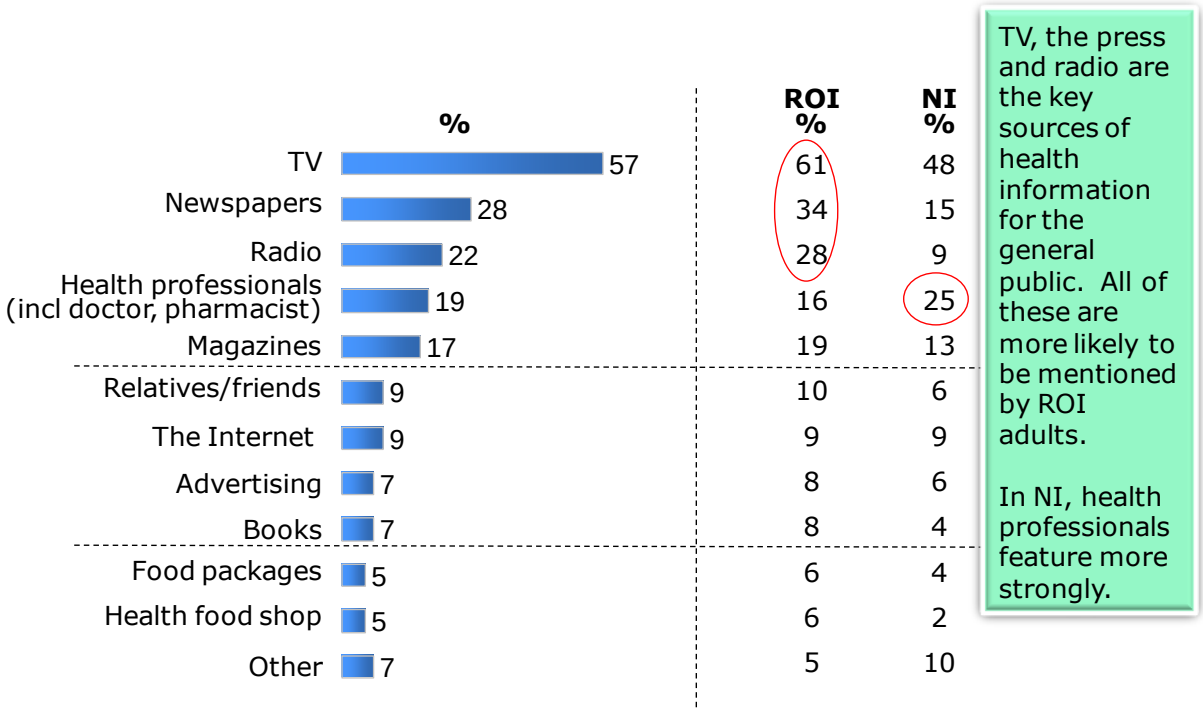
The Safetrak survey asked consumers about their main sources of health information (Figure 3.2). Results indicated that most respondents cited the media as their primary source of health information, with television being the leading source at 57 per cent (Figure 3.2). This is reflective of earlier studies (114). Although media is still the primary source of health information in NI, it does not feature as strongly as in the ROI. Instead, a quarter of those surveyed in NI mentioned health professionals compared to only 16 per cent in the ROI. The Food Standards Agency (FSA) (37%) and the Food Safety Authority of Ireland (FSAI) (32%) are both the most trusted organisations in each of the two jurisdictions for information on food safety. *safe*food ranked second in the ROI and third in NI.

When specifically looking for information on a health query, nearly half of those surveyed were likely to look on the internet for information. There was a significant difference between respondents in the ROI and NI, with 52 per cent of respondents in the ROI compared to 37 per cent in NI acknowledging that they would look online for health information. Over half of those surveyed (51%) felt that the internet was as reliable an information source as medical professionals and 56 per cent felt the internet was as reliable as information sourced from newspapers and magazines.

The focus groups showed that most people believe that food hygiene and healthy eating messages in the media are of value. However, one in four adults felt that there was information overload and half felt that there were often conflicting messages in the media about food safety and healthy eating.

> *"The reports change. First of all it's good for you and then it's bad for you and you don't know what to believe sometimes." – Belfast C2D females, 30-45 years, with at least one child.*

Figure 3.2: Sources of health information



Base: n=804

3.2.4 Attitudes to healthy eating

The Safetrak data showed that there was an awareness of healthy eating among consumers. Sixty one percent of respondents on the IOI (65% in the ROI and 52% in NI) claimed to think about healthy eating when they choose food. This correlates well with research carried out in 1996 by The Institute of European Food Studies (IEFS) which indicated that 66 per cent of individuals in the ROI thought about healthy eating when shopping (4). While those with third-level education were more likely to consider the healthiness of the food before purchasing (71%), those aged 15-25 years were less likely to do so (44%). This reflects the focus group discussions on patterns of eating (Section 3.2.9), where young pre-family men and women reported consuming more convenience foods, fewer meals made with fresh fruit and vegetables and fitted meals around their lifestyle. Although 60 per cent of consumers claimed that healthy eating was important

when buying food, the quality, taste and price were still of higher priority in determining their choice. These results are consistent with the IEFS research, which demonstrated that quality, taste, family constraints, healthy eating and price (order of importance) were the five most frequently mentioned influences of food choice by respondents in the ROI (4).

3.2.5 Concerns about healthy eating

Most consumers were concerned about healthy eating with 79 per cent of respondents in the ROI and 71 per cent in NI acknowledging that healthy eating was very important.

Figure 3.3: Healthy eating- issue of most concern

Base: All Respondents (804)

	ROI %	NI %
Fats in food/ Fat content/ Saturated fat/trans fat	36	31
Salt	11	20
Cholesterol/blood pressure/ Heart disease	12	9
Sugar intake	10	9
Fruit/Veg	6	9
Preservatives/Additives/Colouring	6	4
Variety in diet	4	5
Diabetes	3	1
Vitamins and minerals	1	2
Fibre	2	*
Wholegrain	1	*
Other	4	5
Don't know/no reply	8	10

When asked to rank the one main issue of concern, consumers cited fat followed by salt (Figure 3.3). A difference between consumers in NI and the ROI in terms of key concerns was evident, with nearly twice as many respondents in NI compared to the ROI citing salt as their key concern. This may be a consequence of the effectiveness of the various promotional campaigns over the past few years in the two jurisdictions.

3.2.6 Perceptions of food and health - the meaning of food for consumers

Functionality

The qualitative research showed that there was a subtle difference in the way men and women talked about food. Women tended to emphasise satiety and feeling full as a key requirement for meals. They deliberately chose filling foods so they would not need to interrupt their activities to eat before their next main meal. Men tended to conceptualise food as fuel and gauged what they need to eat against the energy they needed to expend, topping up between meals with snacks if needed.

Both men and women identified certain foods that they eat for the sake of functional or emotional effects such as a burst of energy (or sometimes "a sugar rush"), a feeling of comfort, a mid-afternoon pick-me-up, a hangover cure, a mood lift, satisfying hormonal cravings, etc.

"A cup of tea and a biscuit, it relaxes you and unwinds you." – Ballina C1C2 Males, 35-50 years, with at least one child.

"Maybe if you stayed late at work and you needed a break you would go for a Mars fix or a packet of chocolate biscuits. Something to cheer you up a bit, to give you a push." – Strabane C1C2 males, 45-60 years.

"After a night out I tend to eat all day – I don't care. Crisps, bold stuff – it's the salt and the sugar, makes you feel better. It helps for about an hour anyway and it's totally worth it for that hour." – Dublin C1C2 young females, 20-29 years.

In some groups (young females in Dublin, young males in Cork and mature females in Limerick), respondents also mentioned eating certain foods to obtain specific health benefits. These respondents talked about 'superfoods' and claimed they make a special effort to include these foods in their diet.

"Garlic is a super food. It's full of vitamins. One of the best things you can put into your body. Good for flu." – Dublin C1C2 young females, 20-29 years.

"Tomatoes are fierce good for you, especially for anti-cancer cells and stuff like that. I would eat a lot more of it now than I normally would." – Cork C2D young males, 20-34 years.

"I'm very impressed with the omega, the fish oil." – Limerick BC1 females, 50-65 years, with grown children who have left home.

Body instrumentality

The focus group further explored the area around food and its function in health and the instrumentality of bodies. Participants clearly viewed their bodies as vehicles to carry out the tasks of their daily lives; going to work, picking up the kids, not getting sick, etc. Most did not require that their bodies function to their maximum potential, nor did they feel this would be a relevant goal. However, beyond these shared basic requirements, different cohorts had additional requirements of their bodies that differed by gender and life stage.

Young females (age 20-29 years, no children)

Young pre-family females acknowledged their routines were physically undemanding and therefore set themselves high standards for external appearance, and would modify their eating habits to ensure that they look well. Weight control was the focus of their attention, but they also mentioned improved appearance as benefits of healthy eating. In general, this cohort tended to evaluate their bodies almost exclusively in terms of meeting immediate needs and gave little thought to long-term health.

Mothers (age 30-45 years)

Among mothers, weight control was the primary association when asked about healthy eating. This is in contrast to the three per cent who mentioned weight control or portion size in the Safetrak survey (Figure 3.1). Mothers also have a somewhat more physically demanding routine than younger pre-family females and need to eat for stamina as well. While mothers were concerned about healthy eating for their children, it was not a priority for themselves and they were more concerned with getting pleasure and stimulation from food as a counterbalance to not having the time or resources (either financial or support) to indulge themselves in other ways. They focused more on short-term rather than long-term consequences of their diet even if they were aware of family health problems.

"I would be more into doing it for my kids." – Belfast C2D females, 30-45 years, with at least one child.

Mature mothers (age 50-65 years, post family)

Like young pre-family women, mature females had an interest in maintaining an attractive external appearance but they tended to be more modest in their expectations for weight control, no longer trying to achieve an ideal size. This group were also interested in disease prevention, not wanting to be a burden or reliant on medication which encouraged them to look beyond their immediate needs with a view towards their long-term health outcomes. It also led them to put more effort into healthy eating than younger females

"*You know, you have to think of 20 years' time, who is going to be looking after you? You might have to be looking after yourself." – Limerick BC1 females, 50-65 years, with grown children who have left home.*

Young males (age 20-34 years, no children)

Young prefamily males were similar to their female counterparts in terms of having a physically undemanding routine and little interest in their physical performance. Several said they were more active when they were "younger". They were also concerned with appearance and changed their diet when they felt they needed to lose weight, although they were less overtly concerned with weight control than young females.

"I used to take the piss out of people drinking light milk and I could eat anything that I wanted. I was still active enough. Then all of a sudden I was working a desk job and I am putting on flab here and I never did that before in my life. I was always like a slim fellow and then I was turning into a heavy git. I said, 'I have to sort this out.' You just become conscious that your metabolism has slowed down." Cork C2D young males, 20-34 years.

In addition, young males with no children mentioned disease prevention as a key requirement. They differed from mature females whose children had left home and mature males in that their focus was on avoiding being sick now, rather than considering their long-term health.

Fathers (age 35-55 years)

Many fathers said they eat healthily for the most part and voiced concern over their long-term health because they wanted to ensure they would still be active and vital when their children grow up.

"Yes, I think about it [healthy eating] because I wouldn't like to have a stroke or a heart attack. I am starting to think a wee bit more about it in the last couple of years. It came to me after reading stuff in the paper." – Strabane C1C2 males, 45-60 years, mix of married and single/divorced/separated/widowed men, with and without kids.

Like mothers, juggling childcare responsibilities with work and personal life gave fathers a more demanding routine than those in the pre-family or post-family life stages. Appearance did not feature as prominently for them as for other cohorts, and weight control was not as closely associated with health. Some actually asserted that it is possible to be "two or three stone overweight" and still have a healthy diet, perhaps indicating some optimistic bias.

"I'd class myself as overweight definitely, but I wouldn't class myself as eating junk food all the time." – Ballina C1C2 Males, 35-50 years, with at least one child.

Mature males – a mix of bachelors and divorced or widowed men (age 45-65 years)

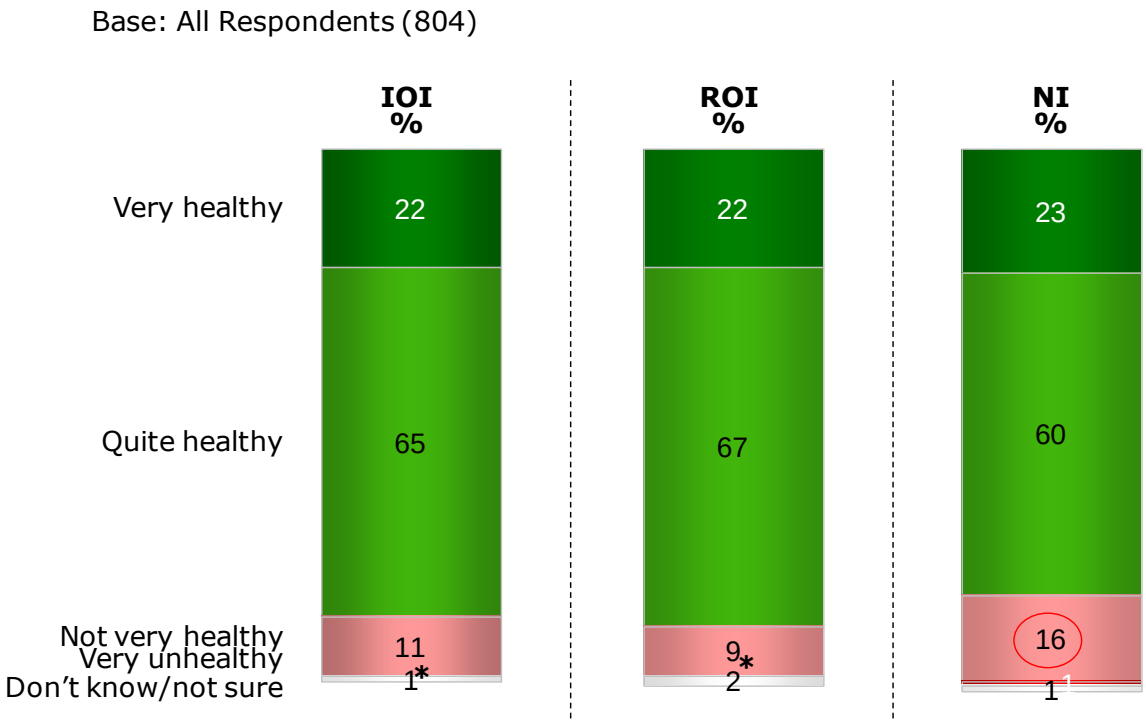
Mature males were like their female counterparts in that they had a relatively physically undemanding routine. However, their consciousness of their vulnerability to disease, and the debilitating effects of disease was sharpened by their age and peer group. Like mature females, they preferred to avoid medical or surgical intervention if possible through healthy eating. Like fathers, they also referenced weight control, and believed that they could be as much as a stone or two overweight without needing to take action.

3.2.7 Perceptions of personal health

Eighty seven per cent of respondents in the Safetrak survey already believe themselves to be very or quite healthy (Figure 3.4). (16% of NI respondents consider themselves "not very healthy", almost twice as many as in the ROI).

Optimistic bias, which became evident in the focus groups, may be a contributing factor to this high level of satisfaction with personal health. The focus groups highlighted that anybody who had not personally experienced a health scare feels invulnerable and felt that their body could tolerate and recover from unhealthy behaviour (Section 3.3.3). This optimistic bias is also consistent with further Safetrak data that showed that only one in four individuals felt that they needed to make changes to their diet.

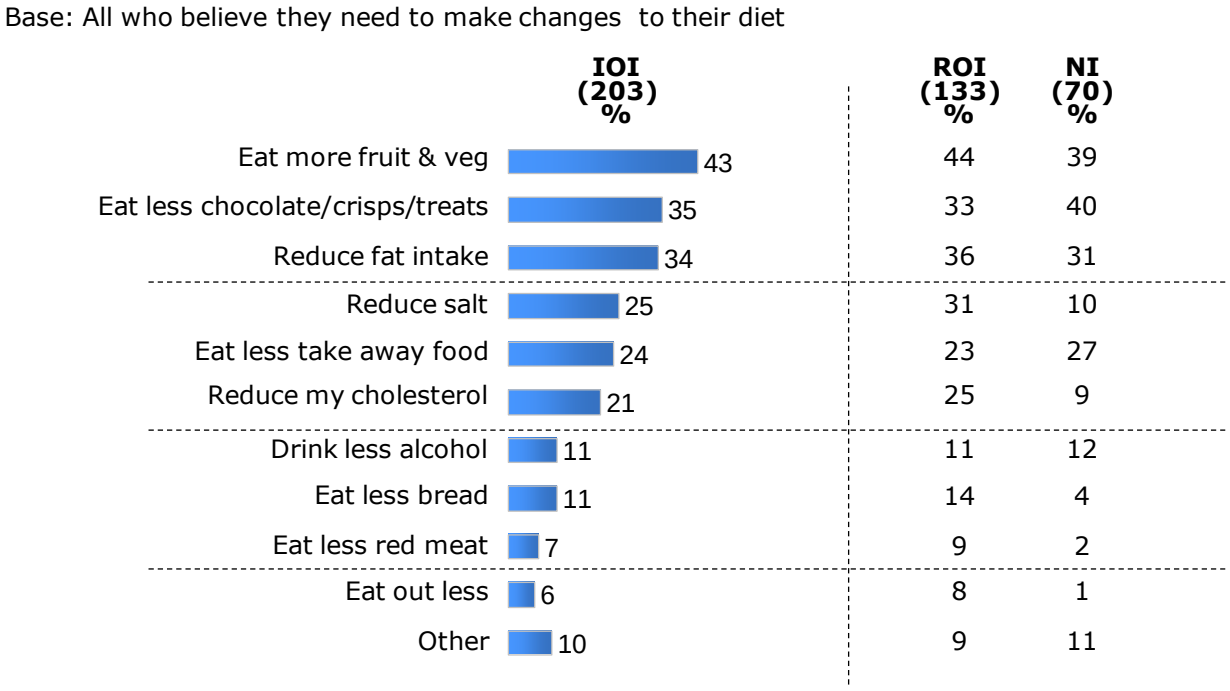
Figure 3.4: Perceptions of personal health



3.2.8 Perceived need for change

Approximately one in four consumers surveyed in Safetrak felt that they needed to make changes to their diet. Of the consumers who acknowledged that changes are required, the popular suggestions were to eat more fruit and vegetables and to eat less 'treat' foods, fat and salt (Figure 3.4). Salt was more of a priority for consumers in the ROI and was mentioned three times more frequently than consumers in NI.

Figure 3.5: Dietary changes that need to be made



The focus groups further explored healthy eating and perceptions and the need for change. In these discussions, with the exception of older men and women, most participants attached diminished importance to long-term health outcomes when compared with short-term outcomes such as mood change or weight loss. This phenomenon, known as 'hyperbolic discounting', may help explain why weight control was more 'top of mind' than long-term health outcomes in discussions of healthy eating. In anticipation of the Christmas holiday season (the focus groups were conducted in late November 2009), many were aware of the potential for temporary weight gain associated with overeating and drinking. Because weight gain can occur over relatively short time periods, the danger of weight gain was more immediate than the danger of developing heart disease, diabetes, or other undesirable health conditions that develop over a longer term. Similarly, temporary effects on mood and the digestive system were immediate and were assigned more important than more remote (in time) risks like heart attack or stroke.

Lack of immediate consequences allowed continuation of unhealthy eating habits despite knowledge of the possible harm. Several anticipated that changing their eating habits may become necessary to maintain their health at some point, particularly in light of family history, but believed they can put off this change until the health problem arises. Lack of consequences in the present was taken as a sign that the threat was not immediate, and therefore there was no perceived need to change.

"I think that when you are in your early twenties you have the invincibility gene and you kind of don't care. But when you get into your late twenties or early thirties you kind of start thinking that it is time to start copping on and change a small few things and then I will be fine hopefully." – Cork C2D males, 20-34 years, pre-family.

3.2.9 Personal factors

Life stage, lifestyle and patterns of eating

The data on consumer knowledge, attitudes and perceptions clearly indicate that there are clear differences for men and women and for life stages. This was also the case in relation to meal patterns. Most focus group participants, in particular parents and mature adults, ate meals at regular intervals each day regardless of hunger or mood, however, in the younger pre-family groups, meals were organised more spontaneously to suit lifestyles.

"I cook every day, 3 meals a day every day." – Limerick BC1 females, 50-65 years, with grown children who have left home

"I can't plan ahead because every day is different so I might feel like this today and just go and get it." – Dublin C1C2 young females, 20-29 years

Those who had meals at regular intervals tended to invest more time, effort and planning into preparing home-cooked meals than those who organised them on an as-needed basis. Those that fit their meals around their lifestyle were more flexible in the timing and in the types of food eaten throughout the day, for example eating breakfast cereal for dinner because it was convenient.

"Well, I'd always, no matter where, even if I was on my own, I'd still cook a dinner. I'd always do potatoes for my dinner, I'd feel if I hadn't potatoes I hadn't a dinner or I'd do vegetables if I was on my own" – Limerick BC1 females, 50-65 years, with grown children who have left home.

"A lot of the time you come in from work and you are tired and although you know you should make yourself a proper meal you say, I will make some pasta and sauce and a bit of cheese on top and that would be it and there would be no veg or meat" – Dublin C1C2 young females, 20-29 years.

Young adults varied meal size depending on hunger and mood. Willingness to make the effort to cook a meal was a factor for young adults and some lone mature women. Irregular schedules were sometimes a contributing factor in this behaviour. These groups tended to consume more convenience foods and fewer meals made with fresh fruit and vegetables than those who were in the habit of preparing dinner every day. The majority of people, across all cohorts, tended to have one meal per day, usually dinner, which was the

focal point of their diet. Dinner was most often the evening meal during the week and most people that ate dinner in the evening, particularly females, deliberately kept earlier meals light in order to 'save their appetite'. Rural participants were more likely to have dinner at mid-day, as were young adults with restaurants in their workplaces who benefited from the convenience of not having to cook an evening meal.

"It's not worth cooking just for one. I would get a dinner at work for about €4.50." – Dublin C1C2 young females, 20-29 years.

"I would have fish for dinner now say or beef, bacon and cabbage, chicken, that kind of dinner every day and for the lunch then I would have sardines or some cold meat and some tomato." – Limerick BC1 females, 50-65 years, with grown children who have left home.

"I would say that I really do try and eat healthy when it comes to my main meal of the day. It was something that was always instilled into me as a kid. My mother pretty much beat that into me. She doesn't know about the snacking though." – Cork C2D young males, 20-34 years.

Stage of change

A key predecessor of behaviour change is readiness to change. Presented below (Table 3.2) are the results from Safetrak for the different stages of change in terms of individuals and healthy eating. Stage of change was measured using the same methodology as the IEFS Pan-EU Survey on Consumer Attitudes to Food, Nutrition and Health(4). A large proportion of individuals was either in the maintenance stage (trying to eat healthy for six months or more) or in the pre-contemplation stage (never thought about dietary change). Small percentages of respondents were classified into the contemplation, action (trying to eat healthy for less than six months), decision (have decided to make changes but not implemented) and relapse stages.

Table 3.2: Stages of change in terms of healthy eating

	Stage of change	% of respondents
	Base 804	
Have *ever* changed diet to eat healthier	Relapse	4
	Action	10
	Maintenance	39
Have *never* changed diet to eat healthier	Pre-contemplation	36
	Decision	6
	Contemplation	1

Stage of change was influenced by a variety of socio-demographic factors. The strongest predictor of those reporting to have improved their diet was age. Forty five per cent of 50-64 year olds compared to only 29 per cent of 15–24 year olds claimed to have changed their diet and were eating healthily for a period longer than six months (maintenance). This is consistent with the findings from the focus group that showed that older people were more conscious of their vulnerability to disease and were trying to eat healthy, while younger pre-family individuals were more concerned with appearance than long-term health benefits. Socio-economic differences in stage of change were also apparent from the Safetrak data. Those in the higher social group were more likely than those in the lower social group to claim that they had ever made changes to their diet in the past to eat healthier (58% compared to 50%). Conversely, the lower social group was more likely to claim they had never made or were not considering changes to their eating habits (39%, compared to 30% in the higher social class). Regardless of social class, the majority of people on the IOI are not currently considering dietary change.

Equally, third-level education strongly predicted an individual's claim to have made changes to eat more healthily with 65 per cent of third-level respondents compared to 51 per cent of those with a secondary education having *ever* changed their diet to eat healthily.

There were also notable gender differences. Men were much more likely to have *never* changed their diet to eat healthier; 42 per cent compared to only 29 per cent of women were in the pre-contemplation group. However, men were nearly twice as likely as women to have made a change in their diet in the last six

months (13% compared to 7%). Marital status is also a key indicator. 42 per cent of married people compared to 36 per cent of single people claimed that they were trying to maintain a healthy diet for a period greater than six months (maintenance)

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3.2.10 Psychological factors

Emotional eating

Respondents across all groups admitted that they sometimes (or even regularly) ate emotionally, using food to relieve boredom, uplift mood and feel comforted. Many strongly associated certain foods with specific emotional effects, for example, chocolate with pleasure. For some, emotional eating was a pastime, in particularly during evenings in front of the television. Some were not even aware of the amount they are eating.

"At night, sitting watching the TV, you take notions. Sometimes you just feel like a bag of crisps or a bar of chocolate. It gives you a lift for a while but that is it." – Strabane, C1C2 males, 45-60 years, mix of married and single/divorced/separated/widowed, mix with kids and no kids.

Self-regulation and optimism bias

The focus group work showed that the majority were very aware of the meaning of healthy eating and they claimed that they could regulate their own diets. However, in reality people's capacity for self-regulation varies according to both their self-awareness and readiness to change their behaviour. Respondents did not acknowledge the inherent contradictions between their perceived ability to regulate their diet versus the myriad of influences that govern their daily lives and affect their dietary choices.

"You are in charge. It's just about whether you want to do it or not and how committed you are to it and the price of the benefit and self control." – Dublin C1C2 females, 20-29 years, pre-family.

As a result, the self-regulation practised was typically either sporadic or relatively relaxed. For women and young men, self-regulation often swung between responsibility and escapism, and moderation becomes a stubborn and beneficial rule. For mid-life fathers and mature men, self-regulation more often meant making small but permanent dietary changes, for example, reducing their intake of red meat or dairy.

Eating to maintain a balance between enjoyment and guilt was a common theme throughout these discussions. Many said they felt guilty when they have perceived unhealthy foods like "take-aways", snack foods and high fat foods. Guilt was managed by restraining indulgence in these foods or through exercise.

"If you're to go climbing for the day you would have a fry. I know you probably shouldn't do that either but I don't have the guilt then." – Cork C2D males, 20-34 years, no children.

"If I go to the shop for bread and milk, I would pick up Taytos and feel very guilty about it." – Limerick BC1 females, 50-65 years, with grown children who have left home.

Health fatalism

Some participants expressed the belief that their health outcomes were predetermined and that behaviour change could not improve their chances of being healthy later in life or reduce their risk of becoming unhealthy[10]. This is known as health fatalism. They often referred to examples of people who led a healthy lifestyle and yet died young due to an accident or genetic pre-disposition as support for their conviction. Those that expressed a fatalist view with respect to health considered behaviour change a waste of time.

"My mother lived to be 87 and she smoked near the end 60 cigarettes a day. It's the luck of the draw. If things are to happen, I'd say they'll happen." – Limerick BC1 females, 50-65 years, with grown children who have left home.

"If you are going to have it, you are going to have it. You could have the healthiest, fittest food and still have it." – Belfast C2D females, 30-45 years, with at least one child.

[10] Rotter, J.B., (1966). Generalised Expectancies for Internal versus External Control of Reinforcement. *Psychological Monographs*, 80, 1-28.

3.2.11 Social influences

Familial influences

The focus groups highlighted that meals play an important role in family cohesion. Most participants reported that the traditional 'family dinner' still occurred once a week i.e. the 'Sunday roast'. In many households young adults return to the parental home for their Sunday dinner. Many reported having family dinners every weekday evening as well.

"We try and eat in the evening time together if we can. You know, work-wise we'll hold dinner back until we're at home so we'd just get something light at lunchtime. It's a nice bit of grub with the kids like." – Ballina C1C2 Males, 35-50 years, with at least one child.

Many said that the people they share meals with, primarily at home, strongly influenced their diet. Women often blamed their husbands for the family weekend 'fry-up' in the house. Dietary influences also came from community norms. For example, mature women claimed that even if they wanted to avoid eating biscuits and cakes themselves, they felt obliged to have them in the house in case guests drop by for tea. Conversely, some gave examples of social influences encouraging and supporting healthy eating. Some examples were a spouse supporting a partner who needed to change their habits for medical reasons or a sports-related peer group sharing advice on how to eat for better physical performance.

"Our house is usually determined by what my husband would like. He would like a meat dinner or fish dinner every day with vegetables and potatoes." – Limerick BC1 females, 50-65 years, with grown children who have left home.

"My wife went on the soya milk too and the regular milk was not in the fridge." – Strabane C1C2 males, 45-60 years, mix of married and single/divorced/separated/widowed men, with and without kids.

"I take probiotics, that type of thing. I just think that it is healthy. My partner gives them to me." - Ballina C1C2 Males, 35-50 years, with at least one child.

Socially reinforced gender roles influenced people's capacity for self-regulation. Men tended to be more confident about their ability to change their behaviour, while women tended to be more conscious of difficulties associated with changing the *status quo*. Women, usually as the primary shopper and meal planner, could only rely on themselves to make better food choices – sometimes against the will of partners and/or children. Men, on the other hand, could either provide better food for themselves or ask their female counterpart (in her role as main food conduit) to provide healthier food for them.

Childhood Conditioning

In most of the focus groups, participants reported their eating habits developed as a result of conditioning from childhood and that they were very difficult to change. All agreed that it is easier to change behaviour in children than in adults.

"We were brought up on fries and greasy food – fish and chips and Ulster fries." – Belfast C2D females, 30-45 years, with at least one child.

"People are set in their ways, in what they do, how they eat, you know. It's like you have to make a conscious decision as to what you want to do." – Ballina C1C2 Males, 35-50 years, with at least one child.

3.2.12 Environmental and cultural factors

Few focus group participants referred to wider environmental influences on their diet yet it is clear that issues such as access to education, standards of living and cultural factors such as gender identities are important. The external factors that were mentioned in particular by participants were time of day, calendar effects and climate.

The majority said they tended to snack more towards the end of the day. Parents particularly described trying to start out the day with good intentions but losing control in the afternoons and evenings when they were tired.

"I always start off good in the mornings with fruit and then I would eat anything; stuff my face." – Belfast C2D females, 30-45 years, with at least one child.

"I have a healthy start in the morning because I can be bad later on." – Limerick BC1 females, 50-65 years, with grown children who have left home.

Many participants acknowledged strong calendar effects on what and how they eat with respondents trying to eat healthy during the weekdays but relaxing and indulging on weekends or holiday periods, particularly if they were drinking alcohol. Indulging involves eating high fat, sugar and salt foods but also overeating and binging.

"You are more likely to snack as well on the weekends. If someone is going to the shops, you will say – bring me back…or you will have something bad like a Chinese or a pizza." – Dublin C1C2 females, 20-29 years, pre-family.

"Whenever you go on holidays, you eat twice as much. You want to try different foods and you are on holidays so why deny yourself? Eat what you want." – Strabane C1C2 males, 45-60 years, mix of married and single/divorced/separated/widowed men, with and without kids.

Many also felt that it is easier to eat healthy in warm weather than it is in cold weather, giving a variety of reasons including; less desire for heavy foods in hot weather, perceived greater availability of fresh and healthy foods and the incentive to maintain or improve physical appearance when wearing lighter less bulky clothes.

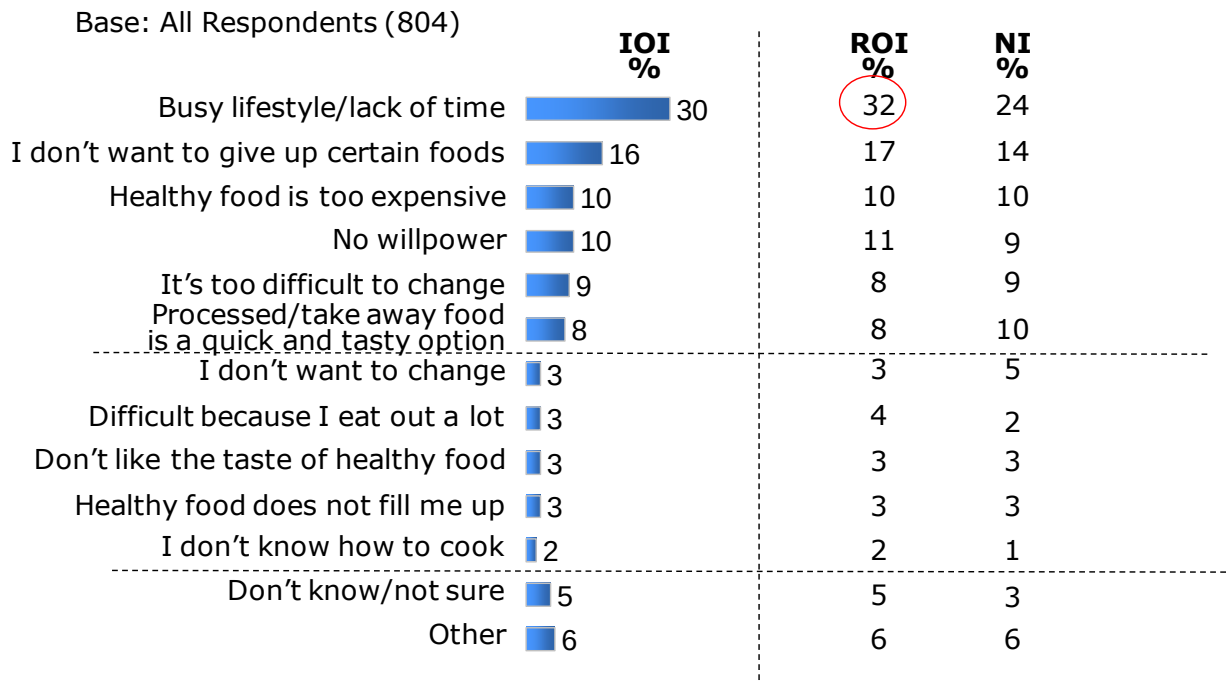
"In the summer you are out in the sunlight a lot more. You feel better. It is dark now at half four and you are sitting in the house. It is comfort eating then." – Strabane, C1C2 males, 45-60 years.

"You don't want a big heavy dinner on a warm day. You actually don't feel as hungry on a warm day." – Ballina, C1C2 males, 35-50 years, with at least one child.

3.3. Self-reported barriers to healthy eating

The research aimed to better understand the current influences on consumers' diets but also the key barriers to improving healthy eating. The Safetrak survey showed that time, food preferences, lack of restraint and cost are the major barriers for most consumers with regard to healthy eating (Figure 3.6). Data from the pan-European survey in 1996, which included the ROI, provided similar findings. The IEFS found that the main barriers to healthy eating were giving up favourite food (34%), willpower (31%), busy lifestyle (19%), and price and irregular work hours (both 17%) (4).

Figure 3.6: Barriers to healthy eating



Similar findings were also evident from the focus group work, which highlighted time, cost, lifestyle, ready availability of fast food and convenience food, calendar effects and social and emotional factors as key barriers to changing diet.

Many respondents felt that the food market is weighted against healthy food choices with a prevalence of unhealthy foods, especially fast foods and convenience foods. There was a perception that healthy foods are more expensive than less healthy foods, often using the example of the price premium for organic foods. In addition, some pointed out that fresh foods are more time-consuming in terms of both shopping and preparation.

"You would have to go shopping every day to get it fresh." – Belfast C2D females, 30-45 years, with at least one child.

"It depends on how much time you have. I love veg but it is hard to cook because it takes time." – Dublin C1C2 young females, 20-29 years.

Parents were particularly alert to the influence of advertising on their children's food preferences and some felt that without strong marketing campaigns, healthy foods simply would not hold the same appeal as heavily marketed packaged foods.

3.4 Promoters of healthy eating

3.4.1 Building better choices into the food market system

Several respondents made suggestions for changing the food marketplace to facilitate healthy food choices. These included measures such as improving the quality and selection of foods available in canteens and other food service outlets that cater to working people. Participants mentioned incentivising purchase of healthy foods by removing or reversing the price differences between healthy and fast foods/convenience foods. They also supported the institution of traffic light labelling to make identifying healthy foods simpler for consumers.

3.4.2 Sport and medical supervision

Several participants cited involvement in sport and regular medical checks as facilitators for making permanent changes to their diet by highlighting inadequacy in the *status quo* and increasing expectations of the body capabilities. Whether the goal was to lower their cholesterol level or train for a race, change in habits was necessary to achieve the goal.

"I was eating about four steaks a week. I had to go off them because the doctor said that it was too much meat." – Strabane C1C2 males, 45-60 years, mix of married and single/divorced/separated/widowed men, mix with and without kids.

"I was buying sausage rolls and crap like that for breakfast but it is only in the last six months that I started training more, that I thought about what I was eating and what it was giving me. Then as a knock-on from that I started changing my diet. But is more just for when I am training so I can do more and push myself more." – Cork C2D males, 20-34 years, pre-family.

Furthermore, both sport and medical advice also provided a context in which an individual can receive advice and support to help make changes either through a sporting peer group or the authority of the physician. In particular, the physician's authority influenced family members, friends and co-workers to respect and support the individual's goal. The men's groups, particularly, felt that peer and social support were vital for maintaining permanent behaviour change.

"Rather than have all your learning from television, if there was a more social side, more clubs set up that people could go there for lunches and things like that, and possibly if eating out was more

accessible, reasonable like – I don't know, it needs a lot of resources." – Limerick BC1 females, 50-65 years, with grown children who have left home

Some men suggested that staging competitions could be an effective tool for involving men in healthy eating campaigns; encouraging them to eat healthier by appealing to their competitiveness.

"Have challenges like Special K have a challenge for women. Men are competitive." – Cork C2D males, 20-34 years, pre-family.

3.4.3 Mass media as a channel to encourage change

Some respondents, particularly in women's groups, felt that mass media can be very effective in raising awareness of the need to eat healthier and explaining or demonstrating how to improve one's diet. Respondents across all groups felt that the public is more educated today about nutrition than people were two decades ago, and thanked the media for bringing "superfoods" to popular attention and generally providing more information highlighting the benefits of foods. Jamie Oliver was credited with demonstrating that healthy cooking does not have to be difficult or time consuming and for disseminating this point of view through television shows, cookbooks and popular media coverage.

"We know more nowadays than they did when we were young. There is so much about it in the media now. When we were younger there was none of that. We ate what we were given." – Belfast C2D females, 30-45 years, with at least one child.

"Food has become quite trendy in the last five or six years. You have celebrity chefs and all that kind of thing. There is a lot more on the telly. But as a result of that in fairness, the celebrity chefs have all tried to get people into eating healthy and into making their own foods. A lot of that would have had an influence on me cooking at home because they show you how simple it is. So rather than paying someone for a crap meal in a box, make it yourself." – Cork C2D males, 20-34 years, pre-family.

Some also felt that TV shows and press coverage that increase the public's identification with the results of poor diet (shows like "The Biggest Loser" and "You Are What You Eat" were mentioned as examples) could trigger behaviour change. However, others felt these shows tend to over-sensationalise their subjects and thus make it difficult for the majority of the audience to identify with them (and the need for change).

"They'll go for the biggest and that's who you'll see but you won't see a normal guy who's 2 or 3 stone overweight because that's the person you should be seeing. But a fella of 40 stone, you

think, 'I've a long way to go until I catch up with him before I get worried about it.' You know, that kind of way." – Ballina C1C2 Males, 35-50 years, with at least one child.

Although there was general agreement that mass media has improved awareness and understanding of healthy eating, there were also some who were sceptical about mass media campaigns promoting healthy eating. Many, particularly men, were dubious about pressure from health professionals in media campaigns to make changes, suspecting vested economic interests. In addition, there was also some ambivalence about expert advice on health and nutrition; changing recommendations and sometimes contradictory messages were cited as evidence that expert advice may not always be reliable.

"It is the government telling you to eat healthy so that they don't have to pay for you when you are in hospital." – Cork C2D males, 20-34 years, pre-family.

3.5 Conclusions

The information presented in this chapter must be considered in the wider context of nutrition behaviour, knowledge, attitudes and the environmental cultural and socio-economic background, which are presented in Chapter 1. However, a number of key issues are apparent. In general, consumers seem conflicted about healthy eating. Many understand what it means, know about the longer term benefits, find it important and are concerned about nutrition issues. Women, older individuals, those with higher education levels and from higher socio-economic groups are generally more engaged with healthy eating. Yet, on a day-to-day basis, health is not really the main concern, they have busy lives and food is used sometimes to simply keep going, or for a myriad of other purposes including emotional and social reasons.

Consumers identified a wide variety of barriers to healthy eating which included time, food preferences, cost, lack of willpower, and the perceived difficulty of making changes. Focus group participants discussed the ready availability of fast foods and convenience foods and felt that the food market is weighted against healthy eating. Added to this is a widespread perception among consumers that their diets are already healthy enough and a belief that they can regulate their diet despite opposing influences.

Suggestions by consumers for promoting dietary change included changing the food marketplace to facilitate healthy food choices, involvement in sport and regular medical checks. Recommendations for research and communications based on the findings of this chapter and the other chapters in Volume 2 are found below. A list of currently funded nutrition-related behaviour research projects are available in Appendix B.

3.6 Recommendations

Table 3.3: Research recommendations for nutrition-related behaviour change on the IOI

Knowledge gap	Public health implication(s)	Recommendation/solution
A wide variety of nutrition surveillance surveys using differing methodologies make comparisons difficult.	Difficulty identifying trends in population nutritional health and monitoring change.	1. Develop a co-ordinated, all-island approach to monitoring trends in nutrition-related non-communicable diseases and in population dietary intakes. 2. Identify important target groups and develop key communication messages based on the findings of nutrition surveillance data.
No longitudinal studies of public knowledge, attitudes and perceptions relating to nutrition issues using consistent methodologies.	1. Difficulty tracking change. 2. No clear understanding of consumer attitudes.	1. Co-ordinated approach by agencies to fund a long-term survey. 2. Supporting qualitative research would offer an additional method to gain in-depth insights into consumer behaviour.
Data on influences on food choice on the IOI are mainly limited to studies of knowledge, attitudes and perceptions of healthy eating and nutrition issues.	Lack of data on wide influences such as the economic environment, the media environment, food and built environment. Food and health policies may result in over-emphasis on promotion of change in individuals rather than the whole eating environment.	Consideration of broad set of influences in the design of research studies on food behaviour on IOI.
The evidence base for food-related behaviour in children and teenagers on	Better understanding and early intervention may result in effective	Studies to gain insight into food-related behaviour in this important group with a view to development of

the IOI is particularly low and must be built in order to target these groups effectively.	behaviour change.	effective interventions.
Little research on IOI on the development of psychological factors that could build capacity and help prevent obesity.	Factors such as low resilience, low self-esteem, optimistic bias and health fatalism may affect an individual's ability to make healthy food choices.	Development of multidisciplinary studies to design interventions to tackle psychological factors, particularly in vulnerable groups such as low income women.
Growing evidence of widespread misperception of body weight but poor understanding of how to overcome this.	1. Body weight misperception presents an important barrier to obesity-related behaviour change. 2. While realistic body weight perception may motivate girls to eat healthily, misperceptions of body weight among normal weight girls may result in unnecessary body weight concerns.	1. Studies to investigate effective methods to promote realistic perception of body weight. 2. Research is warranted as how best to communicate and motivate young women to eat healthily while maintaining positive body image.
Men have been identified as a vulnerable group but effective means to promote behaviour change within this group on the IOI deserves further study.	Better understanding of food-related behaviour in men may result in effective behaviour change.	1. Effective methods to promote behaviour change in men should be explored, including the use of sports or physical activity involvement as a vehicle, the role of the GP, incorporating elements of competition, the role of women as influencers and food providers and identification of key settings. 2. For boys further understanding of the link between physical activity/sports participation and healthy eating is necessary.

The use of social media on the IOI has expanded enormously in recent years but its use in promotion of food-related behaviour change remains untapped.	Great potential to reach large audiences and inaccessible audiences such as young men and women.	Development of evaluation studies for the use of social media in food-related health promotion.

Table 3.4: Recommendations for communication of nutrition-related behaviour change on the IOI

Priorities for communication/intervention	Public health implication(s)	Recommendation/solution
Highlight the importance of public health nutrition issues in preventative health.	Improve potential for the prevention of non-communicable disease.	1. Communicate research results and evaluation of behaviour change programmes to policy makers, stakeholders and the public. 2. Develop media advocacy programmes.
Those from lower socio-economic groups and with lower education status should be key targets for healthy eating initiatives.	Targeting of most vulnerable groups for health improvement/disease prevention.	1. Develop a co-ordinated approach to tackling food poverty. 2. Development of appropriate initiatives that are designed to effectively target these groups.
The family should remain a key target group for nutrition messages due to the importance of familial influences and early conditioning.	Potential for long-term positive influence.	Further development of healthy eating initiatives and resources appropriate for families.
Continued emphasis should be put on improving nutrition knowledge among the public. Men and those from low-income groups should be targeted in particular.	While knowledge alone will not change behaviour, knowledge is an important antecedent of behaviour change.	Continued campaigns to raise awareness of healthy eating, particularly in key target groups.
The rarity of unprompted mention of nutrition-related concerns indicated that continued effort must be made to ensure the relationship between food and health	A more realistic understanding of the relationship between food and health may promote positive behaviour change.	Messages that focus on encouraging the public to examine their eating habits and reflect on possible changes.

becomes top of mind for consumers.		
Psychological factors such as health fatalism, optimistic bias, a perception of low willpower and emotional factors should be considered in the development of nutrition messaging, particularly in low income groups.	Overcoming barriers to healthy eating.	Development of interventions.
A lack of awareness of body weight status appears to be a major barrier to weight loss, particularly in children and in men, and deserves focus in obesity behaviour change programmes.	Overcoming barriers to behaviour change.	Development of public messages.
Behaviour change efforts that move people from pre-contemplation to contemplation may be key.	Increase relevance of behaviour change.	1. Development of resources and tools for individuals. 2. Development of public message.
Relevance of long-term consequences of unhealthy eating is low.	Improve potential for behaviour change.	Promote understanding and relevance of long-term consequences of unhealthy eating.
Acknowledge key influences and barriers such as vulnerable times of day (evening eating), calendar effects (weekend and holiday), time, cost, lifestyle, availability of fast and convenient food, should be considered.	Overcoming barriers to behaviour change.	Consider important influences and barriers in the development of healthy eating programmes.

Promotion of healthy body weight should be communicated differently to each sex. Males in particular do not perceive being overweight as a problem. Parents widely misperceive their children's body weight.	Targeting may improve effectiveness of behaviour change programmes.	Development of effective campaigns to overcome misperception of body weight in key target groups is essential in tackling obesity.
The mass media remains an important channel for communicating nutrition messages.	Potential for awareness raising among large population group.	Continued use of the mass media to promote behaviour change.
Key settings for the promotion of behaviour change include schools and workplaces.	Target group through existing structures.	Targeted at specific groups.
Social media and mobile communications present potentially important new media for the promotion of behaviour change.	Improved reach for behaviour change message and consumer engagement.	Develop social media campaigns to promote behaviour change.

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Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
Obesity The WHO defines "overweight" as a BMI equal to or more than 25, and "obesity" as a BMI equal to or more than 30 (115)	<u>World rates</u> Overweight and obesity is now considered a global epidemic with rates set to rise. In 2005, approximately 1.6 billion adults (age 15+) were overweight and at least 400 million adults were obese. Higher rates are found among low-income or socially disadvantaged groups (116). <u>Rates in Ireland</u> On the IOI approximately two out of every three adults is obese or overweight with 16 per cent	The fundamental cause of obesity and overweight is an energy imbalance between calories consumed, and calories expended. Research has shown genetic factors to be responsible in only about one per cent of cases of obesity (117). <u>Energy-dense, micronutrient-poor foods</u> There is convincing evidence that a high intake of energy-dense foods promotes weight gain (5). Energy-dense foods tend to be high in fat e.g. fried foods, sugars, cakes or starch. <u>Portion size</u> There is evidence that portion sizes at home, in restaurants and also in the retail sector	Obesity is conclusively linked with cardiovascular disease, diabetes, musculoskeletal disorders – especially osteoarthritis and some cancers (endometrial, breast, and colon) and psychological consequences. Childhood obesity is associated with a higher chance of premature death and disability in adulthood.	The total direct and indirect annual costs of obesity in fifteen member states of the EU were conservatively estimated to be €32.8/£29.7 billion in 2002 (125). The Fit Futures Report estimated that, in NI, obesity was resulting in 260,000 working days lost each year and was costing the economy £500/€549 million (16). A study of the direct

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
	classified as obese. One in four children are overweight or obese (see Table 5.6 for details). When compared to international rates, the prevalence of obesity on the IOI is average. Similar rates are seen in Germany and England.	have been increasing since the 1970s (113, 118-120). Research predominantly conducted in the US has demonstrated that when adults and children are served larger portions they consume more calories (121). On the IOI, analysis of the NSIFCS (65) and the National Children's Food Survey (unpublished) have indicated that large portion sizes across many food groups is a key factor associated with obesity. <u>Fibre-containing foods - Fruits and vegetables and whole grains</u> There is convincing evidence that a high dietary intake of fibre (most specifically NSP) is a factor in protecting against weight gain and obesity as well as being an effective weight loss strategy (5). In addition to adding bulk to the diet, dietary fibre has a satiety effect. Fruit and vegetables are rich sources of NSP and are energy dilute food sources. The WHO and national and regional recommendations for the prevention of		costs of obesity in children aged six years or more and adults from 1997 – 2004 in the ROI (126) found the annual hospital cost was €4.4/£4 million in 1997, increasing to €13.3/£12.1 million in 2004. Indirect costs of obesity have been estimated to be in the region of €4/£3.6 billion per year in the ROI (17).

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
		overweight and obesity include the promotion of fruit and vegetables among adults and children. <u>Sugar sweetened beverages</u> The WHO (5) has suggested that the consumption of sugary drinks may increase the risk of obesity. Because sugary drinks increase energy/calorie intake (without being as filling as solid food), people still need to eat/consume more calories to feel satisfied (122-124).		
Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels and include: Coronary heart	CVDs are the number one cause of death globally (127). In 2004, an estimated 17.1 million people died from CVDs, representing 29 per cent of all global deaths. Of these deaths, an estimated 7.2 million were due to CHD and 5.7 million were	A cardioprotective diet should consist of a variety of foods, and should aim to achieve four major goals: a healthy overall diet, a healthy body weight, a desirable lipid profile, and a desirable blood pressure. There is strong observational evidence that reducing intakes of total fat (to less than 30% of calories), saturated fat (to less than 10% of calories), and salt (to less than 5 g or 90	CVDs are the number one cause of death globally: more people die annually from CVDs than from any other cause (127). An estimated 17.1 million people died from CVDs in 2004, representing 29 per cent of all global deaths.	The cost of CVD to the EU economy is estimated at €192/£175 billion per year. Of the total cost of CVD in the EU, 57 per cent is due to direct health care cost, 21 per

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
disease (CHD) – disease of the blood vessels supplying the heart muscle commonly causing heart attacks and cerebrovascular disease - disease of the blood vessels supplying the brain commonly causing strokes.	attributed to stroke. For those living with CHD, it can have a major impact on quality of life. Mortality rates across the EU vary significantly. Central and Eastern European countries have much higher rates of mortality than those seen in Northern, Southern and Western Europe. Age-standardised mortality rates for both heart disease and stroke on the IOI are average or below compared to other European countries (128). In the ROI, CVD is the largest cause of mortality with 9,662 deaths attributed to the disease in 2006 (129). In NI, 4,879 deaths were	mmol per day), and increasing fruits and vegetables (to 400–500 g daily) are likely to be beneficial. <u>Fruit and vegetables</u> A number of mechanisms through which fruits and vegetables can lower CVD risk have been established including their dietary fibre content, low energy-density, vitamin and mineral content and non-nutrient bioactive compounds (5, 131-136). <u>Dietary Fats</u> Dietary fats have a strong association with the development of CVD (5). A high total fat intake is associated with an energy-dense diet and countries with an average higher fat intake have higher mortality and morbidity rates of CVD compared to countries with lower intake. Saturated fatty acids (SFA) and	Of these deaths, an estimated 7.2 million were due to CHD and 5.7 million were attributed to stroke. In addition CVD can have a major impact on quality of life.	cent to productivity losses and 22 per cent to the informal care of people with CVD (128). A UK study estimated the economic costs of CVD, including direct healthcare costs, informal care costs and productivity losses at £29.1/€32 billion in 2004 (140). Of this total cost, CHD accounted for 29 per cent and cerebrovascular disease for 27 per cent. No recent data on the

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
	caused by CVD in 2006 (130). In both jurisdictions the ratio of deaths from heart disease to stroke is approximately 2.5:1. There is a strong social class divide in CVD mortality and morbidity rates with those from lower social classes exhibiting higher rates.	*trans* fatty acids (TFA; produced as a by-product of the hydrogenation of fats) increase the risk of heart disease by raising harmful low density lipo-protein (LDL) cholesterol and lowering beneficial high density lipo-protein (HDL) cholesterol in the blood which in turn lead to the thickening of the blood vessels. Polyunsaturated fatty acids (PUFA) and monounsaturated fatty acids (MUFA) have a positive effect on CVD risk by lowering LDL cholesterol and increasing HDL cholesterol. <u>Fish and fish oils</u> There is convincing evidence that fish and fish oil consumption decrease the risk of CVD, particularly for high risk individuals (5). More benefits are achieved for those who have already had a heart attack (137-139). The WHO recommends regular fish consumption i.e. one to two portions per week, each containing an equivalent of 200 to 500 mg		economic cost of CVD in the ROI have been published.

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
		of the omega-3 fatty acids eicosapentaenoic acid and docosahexaenoic acid, for cardiovascular health. Dietary fibre The WHO (2003) indicated that dietary fibre probably decreases the risk of CVD (5). Both soluble (found in fruit and vegetables) and insoluble (wholegrains) fibre are known to reduce LDL cholesterol which provides a plausible mechanism through which dietary fibre reduces the risk of CVD. Salt Sodium intake, mainly through dietary salt is directly associated with increased blood pressure (5). A relatively modest reduction in salt intake has important beneficial effects on blood pressure in those with and without high blood pressure. Overweight and obesity		

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
		People who are overweight and obese have an increased risk of CHD (5). Overweight is associated with a number of the key risk factors associated with increased risk of CVD including raised blood pressure, raised blood cholesterol, type 2 diabetes and low levels of physical activity.		
Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin (the hormone that regulates blood sugar), or alternatively, when the body cannot effectively use the insulin it produces.	There are an estimated 25 million people in Europe with type 2 diabetes (141) and 180 million people worldwide (5). In the ROI there is an estimated 129,052 adults with the condition (4.3% of the adult population). It is estimated that 62,287 adults in NI have type 2 diabetes (5.1% of the adult population). The number of people with diabetes on the	The main cause of diabetes is diet and lifestyle associated, with the majority of people suffering from the condition having excess body weight. Obesity (see above) is a major risk factor for the disease with clear parallels drawn between the rise in obesity levels and the increasing prevalence of type 2 diabetes. The factors associated with the condition are those associated with obesity and CVD described above. Inactivity, which in itself is linked to increasing BMI, is also a key factor in the development of diabetes.	Diabetes is now one of the leading causes of death through its effects on cardiovascular disease: 70-80 per cent of people with diabetes die of cardiovascular disease and it is also the leading cause of kidney failure, blindness, and amputation in adults. Diabetes is ranked among the leading causes of blindness, renal failure and lower limb amputation with type 2	The total cost of caring for people with diabetes in Europe is estimated between €28 and €58 billion (£26-£48 billion) per year (141). Costs are rising throughout Europe because of increasing obesity, sedentary lifestyles and an ageing population. The recent CODEIRE

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
	island is expected to increase because the population is growing, it is ageing and obesity rates are rising.		diabetes accounting for 85-95 per cent of cases of type 2 diabetes. The WHO projects that diabetes death rate will increase by more than 50 per cent worldwide in the next 10 years (142).	study in Ireland highlighted that Diabetes is costing Ireland €580/£528 million each year with individual patient costs being €2,468 (143). In the UK, costs for diabetes care rose from £8.3 to £10.7 (€9-12) billion between 2004 and 2007.
Osteoporosis Osteoporosis is a disease characterised by low bone mass and structural deterioration of	The disease affects an estimated 200 million people worldwide. One in three women over 50 will experience osteoporotic fractures, as will one in five men.	Calcium is a major building-block of our bone tissue, and our skeleton houses 99 per cent of our body's calcium stores. Calcium requirements are high in our teenage years with the rapid growth of the skeleton, and during this time, our body's efficiency in absorbing calcium from food increases. With age, however, absorption efficiency declines,	In 2000, International Osteoporosis Foundation (IOF) estimated that the number of osteoporotic fractures in Europe was 3.79 million, of which 890,000 were hip fractures. These fragility	The total direct costs in Europe resulting from osteoporotic fractures were estimated at €31.7/£28.9, billion which were

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
bone tissue, leading to bone fragility and an increased susceptibility to fractures, especially of the hip, spine, and wrist. Osteoporosis is more common in women and occurs primarily as a result of normal ageing, but can arise as a result of impaired development of peak bone mass.	In the ROI it is estimated that up to 300,000 people aged 50 years and over may have osteoporosis (144). The prevalence is rising as the population ages. The national statistics on osteoporosis are incomplete, but in 2004 there were 6,113 hospital episodes where a diagnosis of osteoporosis was recorded. This is thought to represent the 'tip of the iceberg'. In the UK there are about 230,000 osteoporotic fractures every year (145).	which is one of the reasons why seniors also need to consume higher amounts of calcium. Milk and other dairy products are the most readily available dietary sources of calcium. Dairy foods have the additional advantage of being good sources of protein and other micronutrients (besides calcium) that are important for bone and general health. Vitamin D is essential for bone health, since it helps calcium absorption from the gut into the blood stream and to deposit the calcium, with phosphate, into the skeleton. The WHO found conclusive evidence that this vitamin reduces the risk of osteoporosis (5). Protein plays a key role in bone mass acquisition. During growth, under-nutrition, including insufficient caloric intake and protein, can severely impair bone development. Low protein intake can be detrimental for skeletal integrity by lowering	fractures lead to reduced quality of life, morbidity and, in some cases, mortality. In the UK there are about 230,000 osteoporotic fractures every year. In addition, 1,150 people are dying every month in the UK as a result of hip fractures (145).	expected to increase to €76.7/£70 billion in 2050 based on the expected changes in the demography of Europe. In the UK it is estimated that oosteoporosis costs the NHS and government approximately £2.3/€2.5billion a year (145). In the ROI, an estimated annual baseline cost is €404/£376 million. If current trends continue it is estimated that costs will escalate

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
		both the production and action of a growth factor, IGF-1, which enhances bone formation.		to €1/£0.9 billion by 2020 and over €1.5/£1.4 billion by 2030 (144).
Dental diseases include dental caries, developmental defects of enamel, dental erosion and periodontal disease.	Worldwide, the most common oral diseases are dental cavities and periodontal (gum) disease. 60 to 90 per cent of school children worldwide have dental cavities. Severe periodontal (gum) disease, which may result in tooth loss, is found in five to 20 per cent of middle-aged adults; the rate varies across geographical regions. Peak activity of dental caries occurs during childhood. Research suggests that the prevalence of dental erosion	The most important dietary factors in relation to dental health are the amount and the frequency with which sugar-containing foods and drinks are consumed (148, 150), with free sugars conclusively implicated as the main causative factor in dental caries (5, 150-152). In line with the WHO (5), recommendations in both the ROI and the UK is that no more than 10 per cent of energy should be derived from free sugars. As evidenced in Table 5.4, intakes across a number of population groups exceeded this recommendation. In the ROI, 18 per cent of children's energy and 15 per cent of teenagers' energy was from confectionary, snacks and biscuits (153). In the UK, the main sources of free sugars in	Dental disease can cause significant pain for the individuals affected and have significant impacts on quality of life including the ability to eat and drink. Tooth decay or dental caries which involves the destruction of the outer surface (enamel) of a tooth is the most pertinent oral health issue on the island. Treatment is not without risks. NI has the highest levels in Europe of general anaesthetics for dental reasons, with 8,000	The total cost of oral care in the ROI is €300/£273 million (157). In 2003, £80/ €88 million was spent in NI on health service dental care, while the cost of fixing the decayed teeth of children in NI was over £25/€28 million in 2003 (158).

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
	in children and adolescents on the IOI may have increased in the last 10 years (146-148). In the ROI, in 2002, 45 per cent of a sample of five year olds showed evidence of erosion (147). Dental decay continues to be a significant public health problem in NI, for children in particular, with 61 per cent of five year olds in NI showing obvious signs of decay (149).	the diet of children and adults in the National Diet and Nutrition surveys (2000, 2003) were soft drinks, sugar, preserves and confectionery, especially chocolate confectionery (154, 155). The WHO (5) has serious concerns over the high and increasing consumption of sugar-sweetened drinks by children in many countries. The relationship between dental caries and frequent ingestion of soft drinks has been examined and the findings show that frequent consumption of soft drinks was significantly associated with high caries rates (156).	children attending hospital in 2003 (148).	
Cancer is the term for a large group of diseases in which there is uncontrolled and abnormal cell	In 2006, in Europe there was an estimated 3.2 million incident cases of cancer and 1.7 million cancer deaths (159). With the continuous	The World Cancer Research Funding and the American Institute for Cancer Research systematically reviewed all the relevant evidence in relation to diet and cancer in order to generate a comprehensive series of recommendations on food nutrition and	Primary affected cells invade surrounding tissues and can spread to other parts of the body forming secondary cancers. Treatment is	It was estimated that the worldwide economic burden of new cancer cases was €202/£184 billion in 2009 (162).

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
growth and which can affect any part of the body. There are more than 100 different types of cancer. Most cancers are named for the organ or type of cell in which they start	increase of early diagnosed cases, breast cancer is by far the most common form of cancer diagnosed in European women today. It is also the most common cancer on the IOI and accounts for approximately 29 per cent of all female cancers on the island (159, 160) Prostate cancer accounts for approximately 25 per cent of all male cancers on the IOI. Colorectal cancer is the second most common cancer in both men and women, accounting for 12 per cent of all cancer cases in the ROI and 10 per cent in NI (159, 160).	physical activity designed to reduce the risk of cancer (161). They specified a number of recommendations based on this rigorous scientific evaluation for the future reduction in incidence of cancer as follows:- • maintain a healthy body weight (see Section 1.4) • be physically active as part of everyday life • limit consumption of energy dense foods and avoid sugary drinks that promote weight gain • eat mostly foods of plant origin • limit intake of red meat and avoid processed meat • limit alcoholic drinks • limit consumption of salt and avoid mouldy cereals or pulses • aim to meet nutritional needs through diet alone (dietary	often very invasive involving surgery. In addition, chemotherapy and radiation therapy often have severe side effects such as loss of fertility.	In the ROI it is estimated that there will be over 15,000 new cases of cancer in 2009, and that this will rise to over 20,000 in 2020, an increase of 30 per cent (162). The total economic cost of new cancers in the ROI in 2009 was estimated at over €0.4/£0.36 billion. While there is no data specific for NI, in the UK the rate of increase in new cases of cancer between 2009 and 2020 is estimated to be 15.5 per cent.

Disease	Incidence/prevalence	Nutritional factors	Health consequences	Economic consequences
	Lung cancer is the most common cause of cancer death in men in the EU. Although the incidence of the disease on the IOI is below the European average, it is still the leading cause of cancer death in men (60-61). Cancer is more common with increasing age and half of the patients diagnosed in the ROI during the period 2000-2004 were aged over 68 years.	supplements are not recommended for cancer prevention) • mothers to breast feed; children to be breastfed and • cancer survivors to follow the recommendations for cancer prevention.		The economic cost to the UK of these new cases is expected to be in excess of £6.8/€7.5 billion for 2009 (162).

Appendix B: Ongoing nutrition-related food behaviour research projects

Title of Project	Organisation	Principal Contractor	Funding agency	Completion date

Consumer cognitive responses to food	UCC/UCD/UU/TEAGASC	Dr. Mary McCarthy/Professor Patrick Wall	HRB/Firm Centre for Diet and Health	2013
Determinant of Food Choice	TEAGASC/UCC[1]	Dr. Sinead McCarthy/Dr. Mary McCarthy	FIRM	2012
An investigation into the psychosocial determinants of healthy eating with a focus on the post intentional phase of behaviour enactment	TEAGASC/UCC	Dr. Sinead McCarthy/Dr. Mary McCarthy	TEAGASC/FIRM	2012
Family Eating Out Events "outside the home"	UUC[2]	Prof. Barbara Livingstone	*safe*food	2012
Tribal Aspects of Contemporary Food Consumption in a Postmodern Ireland	UCC	Dr. Mary McCarthy/Dr. Alan Collins	None	2013
An exploration into the eating behaviours of undergraduate female students	UCC/TEAGASC	Dr. Mary McCarthy/Dr. Sinead McCarthy	None	2014
To Develop a Validated Nutrition Evaluation and Nutrition Information Resource for the Pre-school Setting to Promote an Improved Nutrition Environment and Food Provision in this Setting	HSE[3]	Ms. Corina Glennon Slattery	*safe*food	2012
Food Poverty in 4 Household Groupings	Millward Brown	Millward Brown	*safe*food	Completed
Consumers understanding of food portion sizes	UUC	Prof. Barbara Livingstone	*safe*food	2013

A survey of health professional attitudes to assessing body weight status	UUJ[4]	Dr. Anne Moorehead	*safe*food	2011
Early School Leavers: a needs assessment from a nutrition perspective	TCD[5]	Dr. Michelle Share	*safe*food	2012
Food Marketing and the Preschool Child	UCD[6]	Prof. Patrick Wall	*safe*food	2014
"Good Days and Bad Days" An Investigation of the Habits of Shoppers When They Do or Don't Buy Healthy Foods.	QUB[7]	Dr. Moira Dean	*safe*food	2012
Food4Me	UCD	Professor Mike Gibney	EU[8]	2015

[1]UCC = University College Cork

[2]UUC = University of Ulster, Coleraine

[3]HSE = Health Service Executive

[4]UUJ = University of Ulster, Jordanstown

[5]TCD = Trinity College, Dublin

[6]UCD = University College Dublin

[7]QUB = Queen's University Belfast