

North/South Ireland Food Consumption Survey

Irish Universities Nutrition Alliance

Summary Report



About the Irish Universities Nutrition Alliance

The Irish Universities Nutrition Alliance (IUNA) is a formal association of the academic nutrition units at Trinity College Dublin, University College Cork and the University of Ulster. The IUNA is committed to joint initiatives in research and teaching.

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This summary report provides an outline of the **IUNA North/South Ireland Food Consumption Survey: Food And Nutrient Intakes, Anthropometry, Attitudinal Data & Physical Activity Patterns.**

A detailed description of the methodology used and the data obtained from the survey will be made available on the internet at www.iuna.net.

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Published by: Food Safety Promotion Board, Abbey Court, lower Abbey Street, Dublin 1

ISBN: 9-9540351-0-0



North/South Ireland Food Consumption Survey

FOREWORD

In the past 20 years, with increasing affluence and changing lifestyles on the island of Ireland, attitudes and approaches to food have altered dramatically. As a result of these changes the tenet of "meat and two veg" of the last generation no longer adequately describes the diet of today's population. The Irish Universities Nutrition Alliance (IUNA) in conducting this survey has created a clear picture, which illustrates the significant changes in our dietary habits.

The relationship between nutrition and health is well documented. A poor diet and nutrition are identified as risk factors for cardiovascular disease, obesity, diabetes mellitus, gastrointestinal disease, osteoporosis, and some types of cancer. The Food Safety Promotion Board public health programme aims to foster the provision and consumption of a healthy and nutritious diet as a key intervention tool in protecting and improving public health.

The Board seeks to improve the knowledge and skills necessary for the public to choose a safe and healthy diet. To this end detailed nutritional information regarding population dietary habits is essential.

In the wake of BSE and other food scares, consumers have been primarily concerned with issues of food safety. While food safety concerns must of course be addressed, we must also foster a healthy diet. This is of particular importance given that nutritional imbalances currently pose the most significant public health risk in developed countries.

The IUNA survey is therefore both extremely valuable and timely. The information provided by the survey will enhance the knowledge of policy makers in developing public health interventions aimed at reducing the risk of nutrition related disease in the next generation.

Martin Higgins

Interim Chief Executive

Food Safety Promotion Board

North/South Ireland Food Consumption Survey

Summary Report on

Food and Nutrient Intakes, Anthropometry, Attitudinal Data
& Physical Activity Patterns

Irish Universities Nutrition Alliance

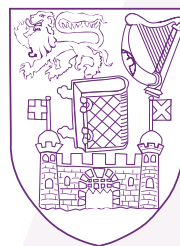
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Irish Universities Nutrition Alliance

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Funding

The IUNA is grateful to the following who provided funds to carry out this survey:

- the Department of Agriculture, Food and Rural Development in Dublin through the Non Commissioned Food Research Programme, part financed by the European Regional Development Fund.
- the Food Safety Authority of Ireland and its predecessor, the Food Safety Advisory Board.
- the Northern Ireland Centre for Diet and Health at the University of Ulster, which is assisted by the European Regional Development Fund through the IRTU Technology Development Programme.
- industrial partners: Kelloggs, Bord Bia, Coca-Cola, Cadburys, Dairy Council for Northern Ireland, Irish Sugar, Kerry Group, Mars Confectionery, Meat and Livestock Commission UK, National Dairy Council, Nestlé Ireland, Tesco Ireland and the Irish Business and Employers Confederation (IBEC).

Acknowledgements

Many people kindly gave their time and advice at various stages throughout the survey, which was invaluable to the success of this project. The IUNA would especially like to thank and acknowledge the following people for their advice and assistance:

- Dr. Karin Hulshof, TNO, Zeist, Netherlands, Dr. Joyce Hughes, UK Department of Health, Ms. Janet Gregory, UK Office of Population Censuses and Surveys, Mr. Steven Finch, UK National Centre for Social Research formerly SCPR, Dr. Gillian Smithers and Dr. Michael Day, UK Ministry of Agriculture, Fisheries and Food, Dr. Mary Flynn, Dublin Institute of Technology, Kevin St., Dr. Joyce Lambe, Dr. Mary Kearney, Dr. John Kearney and Mrs. Jo Gibney, Institute of European Food Studies, Dr. Barbara Knox, University of Ulster, all of whom kindly advised on various aspects of the design and methodology of the project.
- Our colleagues, Dr. Yvonne Carroll, Dr. Bernice Corridan, Ms. Kay Cunningham, Ms. Sheila King, Dr. Helen Roche, Ms. Yvonne Ryan and Dr. Nick Kennedy, who also advised on methodological aspects of the survey.
- Dr. Gordon Cran, Queen's University Belfast and Mr. James Williams, Economic and Social Research Institute in Dublin, for their advice and help in survey sampling.
- Dr. Nick Wareham, Institute of Public Health, University of Cambridge, UK, who kindly provided the Physical Activity Questionnaire, the computer programme to process the data and also assisted in data analysis. Thanks also to his assistant, Dr. Kirsten Rennie.
- Mr. Anthony Johns, Tinuviel Software, Warrington, UK, who developed the customised software used on this project, both the nutrient analysis software (WISP[©], WISP-DES[©], EMS[©]) and the questionnaire software (Q-DES[©], Q-CON[©]).
- Mr. Alan Morgan, CMS Weighing Equipment, London, UK, for his helpful advice on calibration of the anthropometric equipment and Mr. Jim Mannion, Legal Metrology Service, Dublin and the technicians of NICHE, University of Ulster, for carrying out the calibration.
- The Central Statistics Office, Dublin and the UK Office of Population Censuses and Surveys, for advice on classification of social class, socioeconomic status and socio-demographic status.
- All the companies and food manufacturers who so kindly provided nutrition composition details of their products.
- Mr. Jim Larragy, Information Systems Services, Trinity College Dublin, for his advice on creating the relational database using SPSS and training of the survey team in the use of SPSS and Ms. Kathleen O' Sullivan, University College Cork, for statistical assistance.
- Cara Prior, Deirdre Brady, Dr. Michelle McKinley, George Hull, Shauna Trainor, Rachel Gawley, Jacinta Greene and Mary Gilsean for their help with questionnaire data entry.

Sincere thanks are due to the Food Safety Promotion Board for supporting and organising the launch and publication of the Summary Report.

Most importantly, sincerest thanks to all those who volunteered to participate in the survey, willingly gave up their time and welcomed us into their homes. Without you this survey would not have been possible.

Main Outcomes

Foods and beverages

Overall, the 18 to 64 year old population of Ireland, North and South, consumed a wide variety of foods and beverages. Potatoes, bread and dairy products were consumed by almost everybody. Tea was the most common beverage, and was drunk by 91% of adults. Respondents consumed a wide range of meats, meat dishes, vegetables and vegetable dishes. Meats, breads, potatoes, dairy products and biscuits/cakes provided almost 60% of energy. Overall, 24% of food and drink energy was consumed outside the home. Younger adults aged 18-35 years (particularly men) obtained twice as much energy from food and drink consumed outside the home as adults aged 51-64 years.

Alcohol

Eighty percent of respondents (81% of men and 79% of women) were alcohol consumers. Younger adults (18-35 years) were more likely to consume alcohol (74% of men and 70% of women), and in larger quantities, than older adults (51-64 years) (66% of men and 40% of women). Two out of 3 men and 4 out of 5 women consumed alcohol in quantities that were within the recommended ranges. However, 36% of men and 20% of women reported consuming greater quantities than the recommended maximum weekly intakes of 21 units for men and 14 units for women.

Energy and Macronutrients

Five food groups including meats, breads, potatoes, dairy products and biscuits/cakes provided 59% of energy. Protein intakes were more than adequate in most people. Meats, dairy products and breads provided two thirds of the protein consumed. Mean daily fat intakes in men and women were higher, and mean carbohydrate intakes were lower than current dietary recommendations. The four main sources of fat in the diet were meats, spreading fats and oils, dairy products and biscuits/cakes. More than half of the carbohydrate was provided by breads, potatoes, biscuits/cakes, confectionery and savoury snacks.

Dietary Fibre

Men had higher intakes of fibre than women did but women consumed more fibre-dense diets than men. Breads, potatoes and vegetables provided two-thirds of the fibre consumed. More than 3 out of 4 adults did not meet the nutritional goal for dietary fibre intakes. The mean daily fibre intake was below the minimum of the recommended range in almost half of women and one quarter of men. This is likely to contribute to impaired bowel function and constipation, which in turn may contribute to increased risk of chronic gastrointestinal disease.

Micronutrients

Intakes of most vitamins were adequate in the population. Important sources of vitamins and minerals were dairy products, meats, vegetables, potatoes, fish, eggs, fruit, breads and breakfast cereals. A substantial proportion of vitamin and mineral intakes was obtained from nutritional supplements in people who took supplements. There was a significant prevalence of inadequate intakes of calcium in women and of iron in women of reproductive age. Few women of reproductive age achieved the folate intake recommended for the prevention of neural tube defects. A substantial proportion of the population had low vitamin D intakes and was largely dependent on sunlight to maintain adequate vitamin D status.

Obesity

Forty two percent of the population was in the normal weight range. However, a total of 18% were obese (20% of men and 16% of women) and 39% were overweight (46% of men and 33% of women). Since 1990, the prevalence of obesity has increased by 67% overall, up 1.25-fold in women (from 13%) and up 2.5-fold in men (from 8%). The increase in the prevalence of obesity has significant health implications. Obesity is associated with increased risk of a number of diseases, including cardiovascular disease, hypertension, diabetes (type 2), gall bladder disease, bone joint disorders, and certain cancers, while overweight is associated with increased risk of diabetes (type 2). The data predict that an epidemic of adult-onset diabetes will face the health service sector in the not-too-distant future.

Physical Activity

Overall, physical activity levels were low, particularly in women. Participation rates in recreational and particularly vigorous recreational, activities were low. Walking was the most important recreational activity in 41% of men and 60% of women. Watching TV monopolised a major portion of available leisure time for men and women of all ages. When questioned about their levels of recreational activity, most people considered that they should be more active.

Smoking

Approximately 33% of men and 32% of women were current smokers and 28% of men and 25% of women smoked daily. The incidence of smoking decreased with increasing age. Forty one percent of men and 42% of women in the 18-35y category were smokers, compared to 27% of men and 17% of women in the 51-64y category.

Introduction

Introduction

This Summary Report describes the methods used and the main findings with regard to food and beverage consumption, nutrient intakes, and anthropometric, physical activity and attitudinal data from the North/South Ireland Food Consumption Survey (NSIFCS). This survey investigated habitual food and beverage consumption, lifestyle, health indicators and attitudes to food and health in a representative sample (n=1379) of the 18-64 year old adult population in the Republic of Ireland and Northern Ireland during 1997-1999. The extensive electronic database which has been compiled from this survey is the most complete and up-to-date collection of food consumption data available for adults in the island of Ireland. It is one of the most comprehensive of its kind in Europe. It represents a very valuable resource, which will be used by agencies concerned with

public health policy and planning and consumer health protection in Ireland and Europe and by the food industry.

The survey was carried out by the Irish Universities Nutrition Alliance (IUNA - a formal alliance of the academic nutrition centres at University College, Cork, Trinity College, Dublin and the University of Ulster, Coleraine which is committed to joint initiatives in research and teaching). It was funded jointly by the Department of Agriculture, Food, and Rural Development, the Food Safety Authority of Ireland, the Northern Ireland Centre for Diet and Health and thirteen food industry partners.

A detailed description of the methodology used and the data obtained from the survey will be made available on the internet at www.iuna.net.

Background to the Survey

Food consumption databases are developed in almost all EU member states and are central to evidence-based analysis of issues pertaining to food safety and nutrition. The importance of these analyses will increase, as the EU becomes more involved in food safety and public health nutrition. The commitment of the Commission to the establishment of a European Food Authority and a comprehensive food and nutrition policy for the EU has now reached the stage of draft legislation.

There have been extensive developments in the Republic of Ireland in the area of food safety and nutrition with the establishment of the Food Safety Authority of Ireland and of the Cardiovascular Disease Strategy Group of the Department of Health and Children. In the UK, the Food Standards Agency has been created with regional structures in Northern Ireland, Scotland and Wales. The Food Safety Promotion Board has been launched as a new North-South agency responsible for promotion of food safety and public health nutrition on the island of Ireland.

It is clear, therefore, that over the coming years, at EU and national level, there will be increased demand for data on food and nutrient intake for issues of nutrition and food safety. Previous representative surveys of food consumption at the individual level in Irish adults (the Irish National Nutrition Survey carried out by the Irish Nutrition and Dietetic Institute in 1990 in the Republic of Ireland and the Survey of Diet, Lifestyle and

Health in Northern Ireland carried out by the University of Ulster in 1988) are now somewhat dated. In 1999, the National Nutrition Surveillance Centre carried out a health and lifestyle survey, which included dietary intake data obtained from a food frequency questionnaire. The North/South Ireland Food Consumption Survey Database is designed to provide quantitative, habitual food consumption data separately for all eating occasions over each of seven days at the level of the individual and is suitable for a wide range of applications related to food safety and nutrition. These include risk assessment for exposure to chemical and biological hazards in foods, development and implementation of food and nutrition policy and food product development and promotion.

The relationship between diet and health is complex and it is recognised that health is influenced by interactions between diet and other factors, including body weight and body fat content and distribution, lifestyle and physical activity levels. In addition, educational level and attitudes to food and health are important influences on eating behaviour and dietary change. For these reasons the survey was designed to include the collection of data on habitual physical activity levels, measurements of weight, height, hip and waist circumferences and body composition (or percent body fat), smoking habits, socio-economic factors, educational level and attitudes to diet and health.

Aims and Objectives of the Survey

1 To establish in a representative sample of adults aged 18 to 64 years on the island of Ireland a database of:

- habitual food and beverage consumption
- height, weight, body fat content and distribution
- habitual physical activity levels
- lifestyle characteristics, including smoking habits
- attitudes to food and health
- socio-demographic characteristics

2 To apply this database to investigate:

- food and nutrient intakes in relation to nutritional adequacy and excess and compliance with current dietary guidelines
- body weight, body fat content and distribution, habitual physical activity levels, lifestyle and socio-demographic characteristics, and attitudes in relation to food and health

In addition the survey design and the database structure were selected with a view to facilitate its use for a number of other key purposes, including:

- risk assessment for exposure to chemical and biological hazards in the food supply
- the development of quantitative and qualitative food based dietary guidelines for healthy eating
- estimation of current nutrient intakes, and modelling of potential future nutrient intakes from fortified foods and nutritional supplements
- to provide scientific data to underpin food product development and promotion



**Sampling and Recruitment
Procedures and Methods
of Data Collection**

Sampling and Recruitment Procedures and Methods of Data Collection

A sample of 1379 adults between the ages of 18 and 64 years, including 662 men and 717 women and excluding pregnant and lactating mothers, from all over the island of Ireland, took part in the survey. The participants were randomly selected using the electoral register as the sampling frame. Each person who was selected was contacted by mail and followed up shortly afterwards with a visit from a researcher. Eligible persons were invited to participate and a consent form was signed. The response rate was 63%, which was high given the sizeable commitment to the study on the part of the respondents. Analysis of the demographic profile of the sample has confirmed that the survey sample was representative of the population of the island of Ireland with respect to age, sex, geographical location (urban/rural), marital status, social class and socio-economic group.

Food intake was determined using a 7-day estimated food record. The respondent kept a diary of everything he/she ate and drank over a one-week period, recording the time, location, amount, cooking method and quantity of each item of food and drink consumed. To ensure that the level of detail and accuracy of recording was kept at a consistently high level, a researcher visited the respondent in their home or workplace four times during the recording week. A comprehensive quantification protocol, which included a combination of food quantification methods, was used to obtain the best estimates of food and drink consumed. The researcher weighed some foods e.g. breakfast cereals, spreading fats and beverages. A specially designed photographic food atlas was used to assign weights to other foods. Respondents were encouraged to keep food packaging to

allow improved accuracy of the food and portion descriptions.

Self-administered questionnaires were used to collect information on employment status, social and demographic variables, lifestyle factors, habitual physical activity levels, attitudes, health status, medication, supplement use and dieting habits. The researcher carried out body measurements, including height, weight, waist and hip circumference and body composition (i.e. fat/lean ratio using bioelectrical impedance analysis).

The survey commenced in 1997 with a feasibility study to evaluate the proposed methods and to estimate response rates. The main phase of the fieldwork started in October 1997 and data collection was completed in October 1999. Data collection was seasonally balanced. The data were compiled into a fully integrated relational database. This means that each piece of data collected for each respondent is linked to that respondent's ID number. Quality control procedures were implemented throughout the collection, processing and compilation of data.

The survey was designed to provide data on an all-Ireland basis. Although the database is structured so that the data can be analysed for the island as a whole or separately for the North and South, the investigators would caution against drawing any major conclusions from North-South comparisons, as regional comparisons were not included in the study design. Given that such comparisons might interest the general public, the investigators have made some comparisons in key areas of public health nutrition and have found no differences in food and nutrient intake or in body weight or physical activity.

Anthropometry

Anthropometry

Anthropometric data including weight, height, waist circumference, hip circumference and body composition are shown in Table 1. Body Mass Index (BMI;

body weight in kg divided by body height in metres squared) which is the standard measure of relative body weight was calculated using weight and height data.

TABLE 1

	ANTHROPOMETRIC MEASUREMENTS FOR MEN AND WOMEN BY AGE GROUP IN THE NSIFCS							
	Men				Women			
	18-64y	18-35y	36-50y	51-64y	18-64y	18-35y	36-50y	51-64y
WEIGHT (kg)	82.9	81.0	84.8	83.2	67.5	64.6	68.1	71.1
HEIGHT (m)	1.75	1.77	1.75	1.73	1.62	1.63	1.62	1.60
BMI (kg/m ²)	26.9	25.8	27.7	27.6	25.8	24.4	26.1	27.8
WAIST CIRCUMFERENCE (cm)	94.3	90.3	96.6	97.6	81.2	77.5	81.9	86.6
HIP CIRCUMFERENCE(cm)	104.1	103.0	105.4	104.1	101.8	99.6	102.3	104.9
WAIST TO HIP RATIO	0.91	0.88	0.92	0.94	0.80	0.78	0.80	0.82
BODY FAT (%)	21.2	17.7	22.7	24.0	33.2	29.2	34.1	39.1

TABLE 2

	PERCENT MEN AND WOMEN IN EACH AGE GROUP IN EACH OF THE BMI CATEGORIES FROM THE NSIFCS AND THE IRISH NATIONAL NUTRITION SURVEY 1990							
	Men				Women			
	18-64y	18-35y	36-50y	51-64y	18-64y	18-35y	36-50y	51-64y
NSIFCS 2000								
UNDERWEIGHT	0.3	0.8	0.0	0.0	1.1	2.3	0.4	0.7
NORMAL	33.3	44.6	26.7	25.0	50.4	64.2	47.0	32.9
OVERWEIGHT	46.3	41.3	48.9	50.6	32.5	24.5	37.7	36.8
OBESE	20.1	13.3	24.4	24.4	15.9	9.1	15.0	29.6
INNS 1990								
UNDERWEIGHT	0.40	0.8	0.0	0.0	2.7	3.6	1.1	2.7
NORMAL	41.0	58.1	23.7	26.8	56.0	69.3	56.4	25.7
OVERWEIGHT	50.8	37.1	64.5	62.5	28.4	20.5	33.0	40.5
OBESE	7.8	4.0	11.8	10.7	12.9	6.6	9.6	31.1

The World Health Organisation (WHO) BMI cut-off points were used to estimate the levels of underweight (<18.5 kg/m²), normal weight (18.5-24.9 kg/m²), overweight (25.0-29.9 kg/m²) and obesity (≥30.0 kg/m²) in the population.

Table 2 shows that, according to WHO definitions, less than 1% of individuals were underweight, 42% were in the normal weight range, 39% were overweight and 18% were obese. A higher percentage of women (50.4%) than men (33.3%) were of normal weight and a higher percentage of men (46.3%) than women (32.5%) were overweight. Overall, 20.1% of men and 15.9% of women were obese.

The percentage of the population which was overweight or obese increased with increasing age. As can be seen in **Table 2**, 9% of women aged 18 to 35 years and almost 30% of women aged 51 to 64 years were in the obese category. It is also worth noting that 2.3% of females aged 18 to 35 were underweight to a level that corresponds to chronic energy deficiency by WHO standards. In comparison to data published in the Irish National Nutrition Survey in 1990, the prevalence of obesity has increased by 67% in the population. In men in particular, the prevalence of obesity has more than doubled, from 7.8% in 1990 to 20% in 2000.

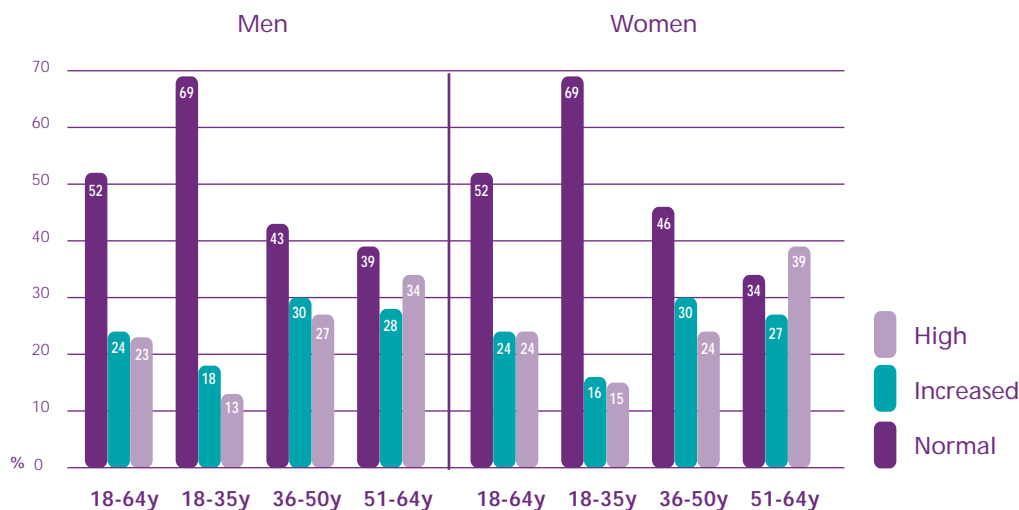
The increase in the prevalence of obesity has significant health implications. Obesity

is associated with increased risk of a number of diseases, including cardiovascular disease, hypertension, diabetes (type 2), gall bladder disease, bone joint disorders, and certain cancers, while overweight is associated with increased risk of diabetes (type 2). The data predict that an epidemic of adult-onset diabetes will face the health service sector in the not-too-distant future.

Body fat distribution is now recognised as an important indicator of disease risk and increased levels of fat deposited in the central area of the body, measured by waist circumference and waist to hip ratio, is associated with increased risk of chronic disease, including cardiovascular disease, hypertension and diabetes (type 2). Cut-off points have been established for waist circumference and waist to hip ratio, which identify people who are at increased risk of these chronic diseases. Using these cut-offs, waist circumference identified 24% of men and 24% of women to be at an increased risk, and an additional 23% of men and 23% of women to be at a high risk for having CVD risk factors. This risk increased with increasing age for both men and women, shown in **Figure 1**.

FIGURE 1

PERCENTAGE OF MEN AND WOMEN IN EACH GROUP WITH INCREASED RISK FOR CARDIOVASCULAR DISEASE, IDENTIFIED BY WAIST CIRCUMFERENCE



Food Consumption

Food Consumption

Foods and Beverages

During the course of the survey, respondents recorded 3,060 individual food items into the 7-day food diary. Each of these foods was allocated to one of 68 food groups. **Table 3**

summarises some of the data from the report on average food group intakes in the total population and in consumers only.

TABLE 3

MEAN AND SD OF FOOD GROUP INTAKES (g/DAY) IN THE TOTAL SAMPLE, PERCENTAGE CONSUMERS OF FOOD GROUPS, AND MEAN AND SD OF FOOD GROUP INTAKES (g/DAY) IN CONSUMERS ONLY

	Population (n=1379)		% consumers	Consumers only	
	Mean	SD		Mean	SD
1 Rice & Pasta, Flours, Grains & Starches	20	32	44	46	33
2 Savouries	24	40	56	43	46
3 White Breads & Rolls	78	59	94	83	57
4 Wholemeal & Brown Breads & Rolls	45	58	73	61	60
5 Other Breads	15	25	52	30	29
6 "Ready To Eat" Breakfast Cereals	19	23	67	29	23
7 Other Breakfast Cereals	16	52	15	105	92
8 Biscuits	14	18	76	19	18
9 Cakes, Pastries & Buns	17	25	60	29	26
10 Wholemilk	150	188	73	205	192
11 Low Fat, Skimmed & Fortified Milks	88	140	45	194	152
12 Other Milks	5	32	6	88	101
13 Creams	2	5	23	7	9
14 Cheeses	12	15	74	17	16
15 Yoghurts	16	33	32	49	41
16 Icecreams	7	13	37	20	14
17 Puddings & Chilled Desserts	16	27	50	32	31
18 Milk Puddings	6	16	16	34	26
19 Eggs & Egg Dishes	17	21	68	25	22
20 Butter	6	12	47	12	15
21 Low Fat Spreads	4	11	28	16	15
22 Other Spreading Fats	12	14	68	17	15
23 Oils*	0	1	14	2	2
24 Hard Cooking Fats	0	1	1	3	4
25 Potatoes	158	165	95	167	165
26 Processed & Homemade Potato Products	7	17	28	25	26
27 Chipped, Fried & Roasted Potatoes	59	59	82	72	58
28 Vegetable & Pulse Dishes	17	43	50	34	56
29 Peas, Beans & Lentils	23	27	75	30	27

	Population (n=1379)		Consumers only		
	Mean	SD	% consumers	Mean	SD
30 Green Vegetables	14	18	63	22	18
31 Carrots	15	20	66	22	22
32 Salad Vegetables	24	28	76	32	28
33 Other Vegetables	25	27	85	30	27
34 Tinned or Jarred Vegetables	3	8	23	12	14
35 Fruit Juices	33	60	41	81	70
36 Bananas	27	44	49	56	49
37 Other fruits	45	65	62	72	69
38 Citrus Fruit	22	50	31	71	68
39 Tinned Fruit	3	9	14	18	18
40 Nuts & Seeds, Herbs & Spices	1	5	18	7	11
41 Fish & Fish Products	23	27	66	35	26
42 Fish Dishes	3	13	7	40	27
43 Bacon & Ham	22	25	80	27	25
44 Beef & Veal	17	25	55	31	26
45 Lamb	7	16	26	27	21
46 Pork	10	19	35	29	20
47 Chicken, Turkey & Game	22	25	71	31	25
48 Offal & Offal Dishes	1	5	4	19	15
49 Beef & Veal Dishes	31	46	47	65	47
50 Lamb, Pork & Bacon Dishes	7	22	14	50	37
51 Poultry & Game Dishes	21	37	35	60	40
52 Burgers (Beef & Pork)	7	15	28	25	20
53 Sausages	10	13	59	16	14
54 Meat Pies & Pastries	5	16	19	29	24
55 Meat Products	19	24	70	27	24
56 Alcoholic Beverages	333	587	65	513	662
57 Sugars, Syrups, Preserves & Sweeteners	18	23	80	23	24
58 Chocolate Confectionery	12	20	63	19	23
59 Non-chocolate Confectionery	2	5	23	8	8
60 Savoury Snacks	6	11	48	12	13
61 Soups, Sauces & Miscellaneous Foods	46	52	93	50	52
62 Teas	561	409	91	619	385
63 Coffees	153	259	55	279	295
64 Other Beverages	258	386	77	335	410
65 Carbonated Beverages	86	152	54	158	177
66 Diet Carbonated Beverages	35	121	21	170	218
67 Squashes, Cordials & Fruit Juice Drinks	20	67	21	96	118

* Does not include oils consumed in recipes

The most commonly consumed foods were potatoes, breads and dairy products, which were consumed by almost the whole population. Potatoes (all types except crisps) were consumed by over 99% of the population, and the mean intake among consumers was 225g per day. Similarly, breads were consumed by over 99% of adults with a mean intake of 139g per day. Dairy products including milk, cheese, cream and yoghurt were consumed by 99.7% and the mean daily intake was 281g, of which milk comprised 243g. Bacon and ham were the most commonly consumed meats (80%), followed by chicken (71%), sausages (59%) and beef (55%). The majority of the population consumed vegetables and fruits.

Men consumed greater amounts of food from most food groups than women, but women consumed a greater variety of foods than men did. Age-related differences were observed with regard to food choice in men and women, with those in the older age categories having a greater consumption of wholemeal and brown breads, porridge, green vegetables and tea. People in the 18 to 35 year age group ate more rice, pasta, chips and savoury snacks than those aged 51 to 64 years.

Ninety one percent of the sample drank tea with an average daily consumption of 619 ml. Coffee was consumed by 55% of the population, averaging 279 ml per day.

Alcohol

Questionnaire data from the sample, which estimated usual alcohol intake, found that 80% (81% of men and 79% of women) were alcohol consumers. Sixty five percent of the sample (70% of men and 61% of women) recorded alcohol consumption during the 7 day recording period. The average daily consumption of alcoholic beverages in drinkers was 767ml in men and

244ml in women. Men and women in the 18 to 35 year group were more likely to consume alcohol (74% of men and 70% of women), than men and women aged 51-64 years (66% of men and 40% of women). The mean consumption of alcoholic beverages in 18-35 year old men was 971ml per day, compared with 596ml per day in 51-64 year old men. Similarly, younger women consumed substantially more alcoholic beverages (319ml per day) than older women did (139ml per day).

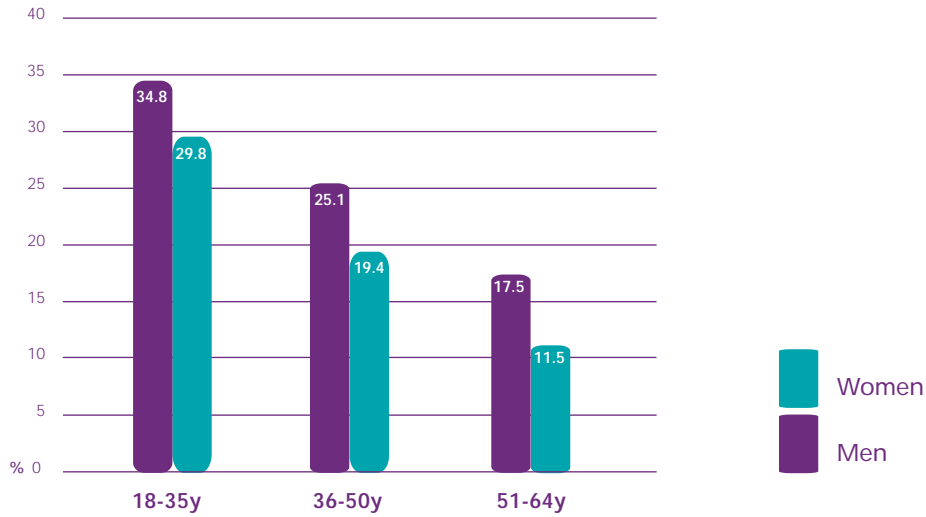
The questionnaire data show that 2 out of 3 men and 4 out of 5 women consumed alcohol in quantities that were within the recommended ranges. However, in alcohol drinkers, more than one third (36%) of men and one fifth (20%) of women consumed greater than the maximum alcohol intake of 21 units and 14 units per week for men and women, recommended by the Department of Health and Children.

Eating Out

With increasing prosperity and changing social and work conditions many people are eating out of home more frequently. In the Survey, respondents were asked to record, in the food diary, where each item of food was eaten. Sixty eight percent of eating/drinking occasions were "at home", 28% in a restaurant/pub/coffee shop/take-away ("out") and 4% in "other people's homes". Seventy two percent of energy was consumed "at home", 24% was consumed "out" and 4% was consumed in "other people's homes". **Figure 2** shows that younger men and women (18-35 years) obtained twice as much energy from foods and drinks consumed outside the home as 51-64 year olds did and the proportion was greater for men than women in each age group.

FIGURE 2

PERCENT OF TOTAL ENERGY FROM FOODS/DRINKS EATEN "OUT"



Nutritional Supplements

The use of nutritional supplements was assessed along with food consumption in the 7-day food diary. In addition, habitual supplement use was assessed in a questionnaire. Three hundred and twenty three respondents (23%) consumed supplements during the recording week and the questionnaire showed that 387 respondents (28%) said that they were currently using supplements. Twice as many women used supplements as men and this ratio did not change with age. People in

the 36-50 and 51-64 year age categories had a slightly higher rate of supplement use than the 18-35 year olds. Other studies of habitual supplement use in the US, Germany, the Netherlands and Sweden have reported similar rates of consumption. One hundred and eighty four separate types of supplements were recorded, including single and multi-vitamin and mineral preparations, a range of cod liver oil-based products and others such as garlic and ginseng.

Nutrient Intakes

Nutrient Intakes

Energy and macronutrients

Mean daily energy and macronutrient intakes and the % of energy (excluding alcohol) from macronutrients of men and women are presented in **Table 4**. Men had higher intakes of energy and all macronutrients than women. Energy intakes decreased with increasing age for both men and women. Five food groups contributed 59% of energy intake in the population overall, i.e. meat and meat

products (16%), breads (14%), potatoes (11%), milk, yoghurt and cheese (9%) and biscuits, cakes and pastries (9%), shown in **Figure 3**. There was little difference between men and women, in the % of energy obtained from the various food groups, with the exception of alcohol, which provided almost twice as much energy in men as in women.

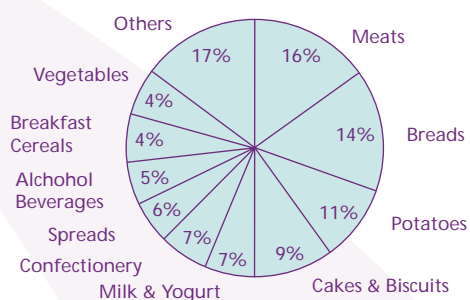
TABLE 4

MEAN AND SD OF ENERGY AND MACRONUTRIENT INTAKES AND THE % OF FOOD ENERGY (EXCLUDING ALCOHOL) FROM MACRONUTRIENTS IN MEN AND WOMEN AGED 18 TO 64 YEARS

	Total Population n=1379		Men n=662		Women n=717	
	Mean	SD	Mean	SD	Mean	SD
ENERGY (MJ)	9.3	3.1	11.0	3.1	7.6	2.0
PROTEIN (g)	84.4	26.9	100.2	26.6	69.8	17.2
% ENERGY	16.4	2.9	16.6	2.8	16.2	3.0
FAT (g)	87.1	33.2	102.2	34.3	73.1	24.9
% ENERGY	36.9	5.8	37.0	5.4	37.0	6.0
CHO (g)	260.1	91.1	305.1	96.0	218.6	62.3
% ENERGY	46.5	5.5	46.2	5.4	46.6	5.6
ALCOHOL (g)	15.8	23.6	22.9	29.8	9.3	13.0

Figure 3

Percent contribution of food groups to energy intake



The mean daily alcohol intake in men (22.9g/day) was 2.5 times that in women (9.3g/d) and alcohol intakes were higher in 18-35 year old men (29.6g/d) and women (12.9g/d) than in 51-64 year old men (17.9g/day) and women (3.9g/day).

The four main sources of fat in the diet were meat and meat products (23%), butter, spreading fats and oils (17%), dairy products (milk, yoghurt and cheese) (13%) and biscuits, cakes and pastries (9%), contributing between them 62% of the fat content of the diet. The four main sources of carbohydrate in the diet were breads (25%), potatoes (17%), biscuits, cakes and pastries (10%) and sugars, preserves, confectionery and savoury snacks (10%), contributing 52% of the total carbohydrate intake. Sixty five per cent of the protein content of the diet was provided by three food groups, meat and meat products (37%), dairy products (milk, yoghurt and cheese) (14%) and breads (14%). The percent contributions of different food groups to protein, fat and carbohydrate are shown in Figures 4-6.

Excessive dietary fat has been linked to an increased risk of coronary heart disease. Current dietary recommendations in Ireland and Europe focus on a reduction in dietary fat intake, especially saturated fat, in combination with an increase in carbohydrate intake in order to replace the energy deficit from reducing fat intakes. The mean daily intakes of fat in men and women (37% of food energy) exceeded current recommendations for fat (for a maximum intake of 35% of food energy) and the mean daily intakes of carbohydrate (46%) were lower than current recommendations for carbohydrate (for a minimum intake of 50% of food energy) (Table 4). When compared to existing recommendations, protein intake in adults was found to be more than adequate.

Figure 4

Percent contribution of food groups to protein intake

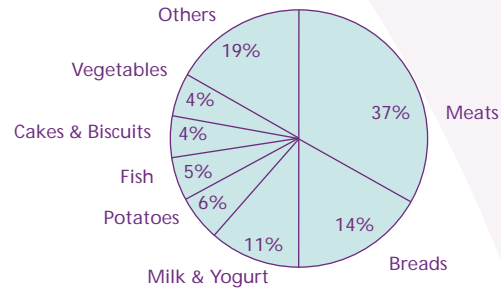


Figure 5

Percent contribution of food groups to fat intake

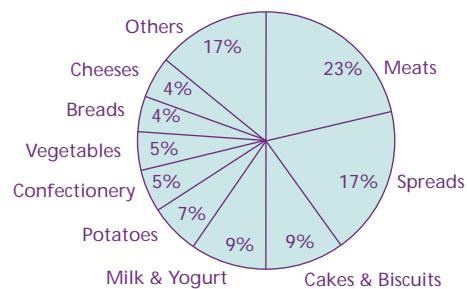
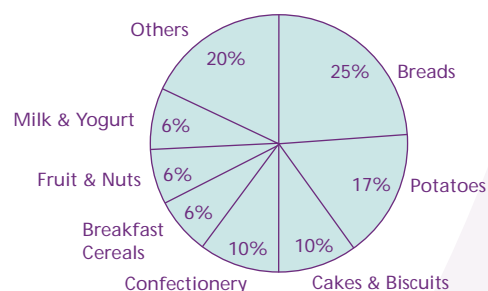


Figure 6

Percent contribution of food groups to carbohydrate intake



Dietary Fibre

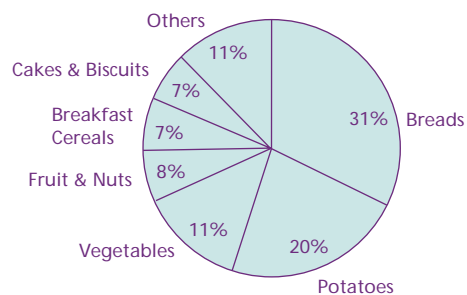
The primary action of dietary fibre in the body is in the gastrointestinal tract and different fibre sources exert different physiological effects. Insoluble fibre absorbs water, and acts as a bulking agent in the stomach, thereby improving satiety. Insoluble fibre also promotes laxation and eating foods high in fibre has been found to reduce symptoms of chronic constipation and diverticular disease. Soluble fibre delays the transit time of food through the stomach and small intestine and improves glycaemic control and insulin sensitivity. Moderate epidemiological evidence suggests a protective role for dietary fibre against coronary heart disease.

The mean daily intake of dietary fibre in the total sample was 20.2g. While, on average, men consumed larger quantities of fibre (23.2g) than women (17.4g), women consumed more fibre-dense diets (2.33 g/MJ) than men (2.16 g/MJ). Expressed as non-starch polysaccharide (NSP), i.e. dietary fibre excluding lignin and resistant starch, the mean daily intake in the total sample was 14.8g (16.7g in men and 13.0g in women). Women aged 18-35 years had the lowest mean daily dietary fibre intake (16.1g).

Figure 7 shows the food contributors to dietary fibre. Overall, the main food groups contributing to dietary fibre intakes were

Figure 7

Percent contribution of food groups to dietary fibre intake



bread, potatoes and vegetables, which collectively provided two thirds of the dietary fibre consumed in the diet.

In order to reduce the incidence of bowel disease, the UK COMA panel on dietary reference values has recommended a daily average NSP intake for the adult population of 18g (equivalent to 25g of dietary fibre) with an individual range of 12-24g (~16-33 g dietary fibre). In this Survey, the mean daily intake of NSP was below the nutritional goal of 18g in 77% of adults (67% of men and 87% of women) and below the minimum of the recommended range (12g) in 37% of the population (48% of women and 25% of men). This is likely to contribute to impaired bowel function and constipation, which in turn may contribute to increased risk of chronic gastrointestinal disease.

Vitamins and Minerals

Table 5 shows the intakes of vitamins and minerals in men and women. Figures 8 to 13 show the main food contributors to intakes of vitamins A, D, C, folate, calcium and iron in the population. Overall, the contribution of nutritional supplements to the mean daily intakes of men and women of all ages for any vitamin or mineral was less than 12%. However, supplements did contribute significantly to the mean daily intakes of some vitamins in supplement consumers.

Intakes were adequate in the population for most vitamins, as indicated by the low percentage of the population with intakes below the average requirements (AR). However, a significant prevalence of inadequate intakes was observed for vitamin A (20% of men and 17% of women), and riboflavin (13% of men and 20% of women). The proportions of men (16%) and women (11%) with mean daily vitamin E intakes less than the lowest threshold intakes indicate that the prevalence of vitamin E inadequacy may be significant. A substantial proportion of the population had low vitamin D intakes and was largely dependent on sunlight to maintain adequate vitamin D status.

Only 2% of women aged 18-35 years and 5% of women aged 36-50 years achieved the recommended folate intake of 600mg/d for women of reproductive years for the prevention of neural tube defects. All of the women who met the recommendation

were using folate-containing supplements. In women aged 18-50 years who consumed supplemental folate (14%, n=80), mean intakes of folate were 480mg (233mg from food and 248mg from supplements), indicating a reduced risk of NTD in this group. Of the women who did not take supplements, none had mean intakes that approached this level.

A significant prevalence of intakes below the AR was observed for iron, calcium, zinc and copper, particularly in women. Forty eight per cent of women aged 18 to 50 years (whose iron requirements are high due to menstrual losses) had inadequate iron intakes, exposing them to increased risk of depletion of iron stores and iron deficiency anaemia. It has been reported that 1 in 3 Irish women has inadequate iron stores and 1 in 30 exhibit iron deficiency anaemia. In women aged 18 to 50 years who used supplements, the proportion with inadequate intakes of iron was half that of women who did not use supplements, indicating that supplements containing iron make an important contribution to the diets of menstruating women.

Calcium intakes were below the AR in 23% of women. Inadequate calcium intake contributes to reduced bone mass and increased susceptibility to osteoporosis. According to the World Health Organisation, one in four women in Europe over 50 years of age has osteoporosis.

TABLE 5

MEAN AND SD OF DAILY INTAKES OF MICRONUTRIENTS FOR MEN AND WOMEN OF ALL AGES

	Men 18-64y (n=662)		Women 18-64y (n=717)	
	Mean	SD	Mean	SD
VITAMINS*				
RETINOL (µg)	598	794	530	687
CAROTENE (µg)	2543	2091	2312	1644
TOTAL VITAMIN A (µg RE)	1022	891	915	751
VITAMIN D (µg)	3.7	3.4	3.7	8.7
VITAMIN E (µg)	11.2	37.2	10.9	27.4
THIAMIN (mg)	2.3	1.5	2.1	4.1
RIBOFLAVIN (mg)	2.2	1.5	2.0	3.4
PRE-FORMED NIACIN (mg)	28.2	9.9	20.7	9.9
TOTAL NIACIN EQUIVALENTS (mg)	48.9	14.2	34.9	12.1
VITAMIN B6 (mg)	3.5	1.9	3.6	7.3
VITAMIN B12 (µg)	5.4	3.7	4.1	3.6
FOLATE (µg)	332	128	260	144
BIOTIN (µg)	42.8	23.6	34.1	25.0
PANTOTHENATE (mg)	6.5	2.7	5.3	4.8
VITAMIN C (mg)	116	223	108	183
MINERALS*				
CALCIUM (mg)	949	354	742	299
MAGNESIUM (mg)	354	116	255	83
PHOSPHORUS (mg)	1645	463	1161	318
IRON (mg)	14.4	5.5	14.1	18.7
COPPER (mg)	1.5	0.8	1.2	0.7
ZINC (mg)	11.6	4.4	8.5	5.0

* All sources including dietary supplements

Figure 8

Percent contribution of food groups to total Vitamin A intake

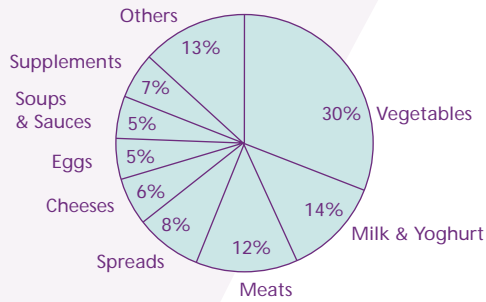


Figure 9

Percent contribution of food groups to Vitamin C intake

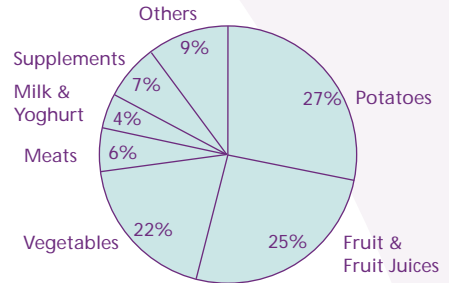


Figure 10

Percent contribution of food groups to Vitamin D intake

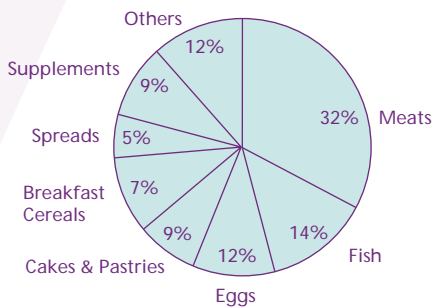


Figure 11

Percent contribution of food groups to folate intake

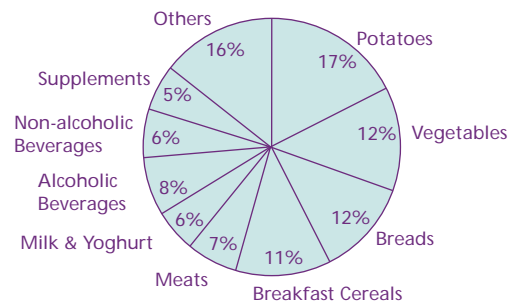


Figure 12

Percent contribution of food groups to calcium intake

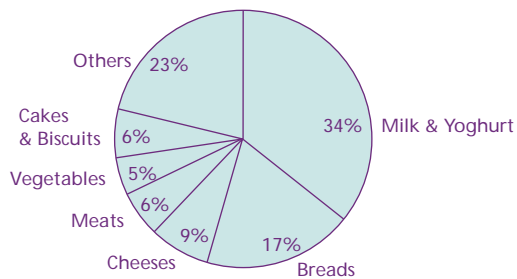
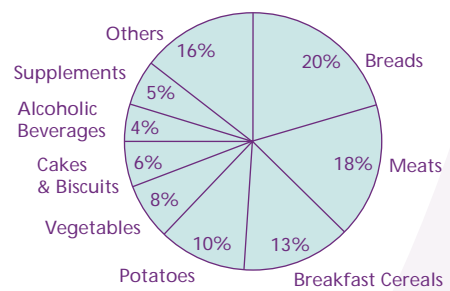


Figure 13

Percent contribution of food groups to iron intake



Physical Activity

Physical Activity

The benefits of regular physical activity are well documented. Epidemiological evidence has demonstrated clearly that physically inactive adults are at increased risk of CVD, hypertension, diabetes mellitus (Type 2), osteoporosis, various cancers, anxiety and depression, as well as all cause mortality. In addition, a sedentary lifestyle contributes to the development of obesity while participation in physical activity aids long-term maintenance of weight reduction and slows down weight gain over time.

Levels of usual physical activity were characterised in the Survey by a comprehensive self-administered questionnaire, which was developed at the Institute of Public Health, Cambridge. The questionnaire provided a detailed assessment of the amount and intensity of all daily physical activities (occupational activity, non-occupational activity and sports and other recreations), and metabolic energy equivalents were assigned to each activity.

Overall, men were significantly more active than women, and in different ways. Men were approximately twice as active in work and recreational activity as women were but women were three times more active in

household tasks. The levels of physical activity declined with increasing age particularly leisure activity in men. Compared with 18-35 year olds, median total physical activity for the 51-64 year old respondents was lower by approximately 25% in men and 50% in women. In women, spending more time in household pursuits offset the decline in work activity with age.

Participation in recreational, particularly vigorous recreational, activities was low. Walking was by far the most important leisure activity for both men (41%) and women (60%). **Table 6** shows average amounts of time spent by men and women of different age groups watching television, in recreational activities such as walking and gardening and in vigorous recreational activities. In terms of hours per week spent in vigorous physical activity, women spent less time (1 hr/wk) than men (1.7 hr/wk), younger respondents (aged 18-35 years) were more active than older respondents, and professional and skilled non-manual women were more active than women in other occupational groups. Fifty percent of women in the 51-64 year age group reported no participation in any vigorous physical activity.

TABLE 6

AVERAGE AMOUNTS OF TIME SPENT BY MEN AND WOMEN OF DIFFERENT AGES WATCHING TELEVISION AND PARTICIPATING IN RECREATIONAL ACTIVITIES AND VIGOROUS RECREATIONAL ACTIVITIES

	All ages	18-35 years	36-50 years	51-64 years
TOTAL				
TELEVISION VIEWING (HR/WEEK)	18.7	19.0	18.1	19.0
RECREATIONAL ACTIVITIES (HR/WEEK)	6.7	7.9	6.4	5.5
VIGOROUS RECREATIONAL ACTIVITIES (HR/WEEK)	1.3	2.1	1.1	0.5
MEN				
TELEVISION VIEWING (HR/WEEK)	19.1	19.2	18.8	19.3
RECREATIONAL ACTIVITIES (HR/WEEK)	8.7	10.4	8.3	6.8
VIGOROUS RECREATIONAL ACTIVITIES (HR/WEEK)	1.7	2.7	1.3	0.6
WOMEN				
TELEVISION VIEWING (HR/WEEK)	18.3	18.8	17.5	18.7
RECREATIONAL ACTIVITIES (HR/WEEK)	4.9	5.5	4.7	4.1
VIGOROUS RECREATIONAL ACTIVITIES (HR/WEEK)	1.0	1.4	0.9	0.4

Watching TV monopolised a major portion of available leisure time and median time spent on TV viewing and related pursuits was similar for men (19 hours/week) and women (18 hours/week). Twenty-five percent of respondents spent at least 25 hours/week in these pursuits. There were no age-related trends in the amount of time spent watching TV.

Higher levels of total, occupational and recreational activities were associated with a trend towards lower BMI in both men and women. On average, overweight and obese respondents spent 2-3 hours per week more time in TV viewing and less time in vigorously active pursuits than non-overweight respondents, as seen in **Table 7**.

TABLE 7

AVERAGE AMOUNTS OF TIME SPENT BY MEN AND WOMEN IN DIFFERENT BMI CATEGORIES WATCHING TELEVISION AND PARTICIPATING IN RECREATIONAL ACTIVITIES AND VIGOROUS RECREATIONAL ACTIVITIES

	BMI (kg/m ²)	<25	25-30	>30
		MEAN	MEAN	MEAN
TOTAL				
TELEVISION VIEWING (HR/WEEK)		17.5	19.5	20.1
RECREATIONAL ACTIVITIES (HR/WEEK)		6.5	7.2	6.4
VIGOROUS RECREATIONAL ACTIVITIES (HR/WEEK)		1.5	1.3	1.0
MEN				
TELEVISION VIEWING (HR/WEEK)		18.0	19.9	19.9
RECREATIONAL ACTIVITIES (HR/WEEK)		8.7	9.3	8.1
VIGOROUS RECREATIONAL ACTIVITIES (HR/WEEK)		1.9	1.6	1.3
WOMEN				
TELEVISION VIEWING (HR/WEEK)		17.2	19.0	20.2
RECREATIONAL ACTIVITIES (HR/WEEK)		5.3	4.5	4.4
VIGOROUS RECREATIONAL ACTIVITIES (HR/WEEK)		1.2	0.9	0.7

The holistic approach used in the assessment of physical activity in this study has revealed important differences in the activity patterns of men and women, which need to be considered in the development of public health policies and programmes aimed at promoting and sustaining lifetime

habits of physical activity. The results have a clear and important public health message - simple population focussed programmes to promote physical activity are unlikely to offer the same chance of long-term success as more sensitive and individualised strategies.

Attitudes

Attitudes

The promotion of healthy eating is likely to be more effective if it is targeted to specific subgroups in the population. In order to identify appropriate target groups for nutrition education, it is necessary to examine the influence of socio-demographic factors on attitudes towards a healthy diet.

Sixty two percent of respondents perceived that they "make conscious efforts to eat a healthy diet" either "most of the time" or "quite often". These respondents tended to be women, older subjects (51-64 years), to have a professional occupation or a managerial/technical position and to be either a non- or ex-smoker.

Awareness of the need to alter one's diet is an important stage in changing dietary behaviour. Just over half of respondents (52%) considered that they do not need to make changes to their diet, as it is healthy enough. Respondents who were more

likely to perceive that they did not need to make any dietary changes tended to be people in the 51 to 64 year age group and people who were educated to primary level only. A total of 572 respondents said that they had modified their eating habits in the past year. Women, respondents with a tertiary level education or a professional occupation, respondents who were obese and non-smokers were all more likely to have made dietary changes in the previous year. Sixty four percent of people made changes because they wanted to eat a healthy diet while 53% did so because of obesity/overweight, shown in **Table 8**. Respondents who had modified their eating habits for the purpose of eating healthily were more likely to be women, well educated and from a higher social class. **Table 9** shows that the most common dietary changes were a reduction in fat (70%) and an increase in fruit and vegetables (67%).

TABLE 8

REASONS FOR MAKING DIETARY CHANGES CITED BY RESPONDENTS WHO HAD MODIFIED THEIR EATING HABITS OVER THE PAST YEAR (N=572)

REASON	%
WANTED TO EAT A HEALTHY DIET	64
OVERWEIGHT/OBESITY	53
BOWEL PROBLEMS	11
OTHER REASONS	9
DIFFERENT FOOD PREFERENCES	8
HIGH BLOOD PRESSURE	7
RAISED CHOLESTEROL	7
STOMACH PROBLEMS	6
CONVENIENCE	5
FAMILY HISTORY OF ILLNESS	4
ALLERGIES	3
DIABETES	2
UNDERWEIGHT	1

TABLE 9

PERCENTAGES OF RESPONDENTS WHO REPORTED MAKING SPECIFIC CHANGES TO THEIR EATING HABITS OVER THE PAST YEAR

DIETARY CHANGE	%
REDUCED FAT	70
INCREASED FRUIT AND VEGETABLES	67
INCREASED FIBRE	41
REDUCED CALORIES	34
REDUCED ALCOHOL	22
INCREASED CONVENIENCE FOODS	5
INCREASED ALCOHOL	2

Almost half of the population (48%) agreed with the statement "my weight is fine for my age". The respondents most likely to think that their weight was appropriate were aged 18 to 35 years, unskilled workers and students and those in the normal weight range. Among those that were obese, 86% disagreed with the statement. A relatively high proportion (50%) of the older age group (51-64 years) considered

that their weight was fine for their age in spite of the fact that 27% of this group were obese and 44% were overweight. Most respondents (81%) believed that they should be taking more exercise and 45% felt that they should be taking a lot more exercise, suggesting that the majority of respondents were not complacent about their level of exercise.

Smoking

Smoking is a known risk factor for coronary heart disease, stroke and cancer. In Ireland, it has been estimated that smoking is associated with 21% of total deaths, in comparison to, Sweden, for example, where smoking accounts for 8% of total deaths. Approximately 33% of men and 32% of women were current smokers and 28% of men and 25% of women smoked daily. On

average, most adults commenced smoking in their late teens and of those who gave up, most did so in their early thirties. In men and women, the incidence of smoking decreased with increasing age. Forty one percent of men and 42% of women in the 18-35y category were smokers, compared to 27% of men and 17% of women in the 51-64y category.

how to contact us

Telephone our free helpline:


from the north on: 0800 085 1683

from the south on: 1800 40 4567

Write to us at our interim postal address:

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