Summary

Throughout the 20th century, average life expectancy has been increasing. This is primarily a result of a change in disease patterns, as infectious diseases have declined, and chronic diseases have become the nation’s main killers. A number of factors are recognised to influence the risk of chronic disease, including diet and lifestyle. Therefore, dietary guidelines have been developed to help people follow a diet that can maximise their health and longevity. These guidelines complement more detailed dietary reference values, which were first established in 1950. Since then, these values have stayed much the same, and today they are used to asses the...
nutritional adequacy of the diet using data from dietary surveys, such as the National Diet and Nutrition Survey. The National Food Survey is another important source of information about what the population are eating. This survey has collected data on food purchased for consumption in the home since 1940 and therefore can provide invaluable information on trends in estimated food, energy and nutrient intake for the general population. Figures estimated from the National Food Survey suggest that since the 1970s, total energy intake has been falling in line with falling levels of energy expenditure. Nevertheless, this decline in energy expenditure has left individuals prone to gaining weight, yet the dietary guidelines in use today still focus on the need to monitor intake of fat and saturates. On the face of it, the British diet has been remarkably stable over the past 60 years. However, what has been evident is a shift towards a lower fat diet with lower fat meats, such as poultry overtaking beef, pork and lamb as the most popular meats and semi-skimmed milk dominating the milk category since its introduction in the 1980s.

There are a number of factors that have affected the trends in food consumption, some of which can be attributed to specific events; for example, the drought from 1975 to 1976 caused a shortage of potatoes, resulting in a high market price, which in turn led to a decline in potato consumption. It is beyond the scope of this Briefing Paper to explain all of the variations and changes in food intake over the past 60 years. However, this paper does provide an overview of the factors (namely government policies, advances and innovations of the food industry and consumer-led changes) that have influenced food availability and access since the 1940s. For example, a significant policy that has had influence is the Common Agricultural Policy (CAP), which was devised by six nations of the European Economic Community in response to the effects of war, in particular world food shortages. Many of the original objectives of CAP had been met by the time the UK joined in 1973. However, through various reforms the policy has continued and has had a significant impact on food supply, food prices and the environment. More recent government policies regarding food availability have focused on improving the nutrient profile of foods and promoting a healthy balanced diet.

The food and farming industry’s compliance with CAP has strongly influenced the way in which foods have been produced and the direction of the agricultural industry. For example, intensification has been essential to meet the required productivity and has relied upon the use of inorganic fertilisers, herbicides and pesticides. However, some producers have opted to produce foodstuffs organically, which has been supported by some consumers and become somewhat of a niche market.

Since their popularisation in the 1960s, the buying power of supermarkets, and fast turnover of foods, has meant it became possible to stock a larger variety of produce from across the world at more affordable prices. The increasing floor space opened a door for manufacturers and retailers to showcase a widening range of products and gave consumers an opportunity to compare products and select their preferred choice. The wide variety of food products available since the 1960s has been the result of new food technologies and more recently new ingredients and novel foods. These advances have been coupled with an increase in the ownership
of domestic appliances, including fridges (1960s), freezers (1970s) and microwave ovens (from the 1980s).

Since the 1980s, there has been an increase in the proportion of women who worked; therefore, convenience became a driving factor for consumer purchasing. These social trends were reflected in the increased popularity of eating out. Convenience has remained an important determinant of consumer purchasing choice, and advances in food technology and manufacture have meant that today it is possible to cook a meal in minutes. Advances in food science and technology have also enabled health-promoting products, so-called functional foods, to be produced, and for many health-conscious individuals these have proved very popular. For some consumers, the health benefits of a food have been a driver for food purchasing habits, and advertisers have taken advantage of this for decades. In particular, the association between food and health was becoming well recognised during the 1980s. This was fuelled by the publication of dietary guidelines and research reports, such as those advocating the importance of a diet low in saturates. Over the past 20 years, other ethical concerns surrounding food manufacture have been high on the agenda of food companies and consumers alike.

Apart from day-to-day advice, a main channel of the BNF’s advocacy is the production of scholarly but easily understandable briefing papers on particular nutrients and particular nutritional problems. This paper is the latest in that series and presents a very valuable picture, not only of the patterns of food consumption in this country over the last 60 years, but also of the policies of government that have influenced, or attempted to influence it, and the effects of changing lifestyles.

The figures in the Briefing Paper are, of necessity, almost all averages. Dr Elsie Widdowson, FRS, an early President of the Foundation, was one of the first to emphasise the enormous variation of intakes between individuals that is concealed by these averages. Apart from the needs of special groups, such as athletes or vegans, should nutrition policies take account for this variability? Nutrition scientists, using the techniques of modern molecular biology, are beginning to identify modifications of genes controlling particular metabolic pathways with potential clinical effects. Therefore, there is much talk nowadays of personalised diets to fit an individual’s genome; whether this will lead anywhere is difficult to tell, but this is a new area where there would clearly be a need for close collaboration between science and industry.

A second kind of advocacy that the BNF has developed over many years is directed to schoolchildren by provision of materials for learning about nutrition and...
food technology. Here the BNF makes a very important contribution, because it is likely that eating habits and lifestyles established in childhood persist throughout life. Obesity is a case in point – one much in the public eye at the present time. Thirty years ago, in a joint report of the Department of Health and the Medical Research Council, we said that obesity was becoming an epidemic, and now there is evidence that the epidemic is becoming even more widespread. Anyone who, like me, has run an obesity clinic for adults knows how difficult it is to cure; the answer lies surely by inculcating healthy eating habits and physical activity in childhood, and here the BNF’s work has made important contributions.

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Foreword by Professor Martin Wiseman

One of the most important aspects of this Briefing Paper is perhaps so obvious it might be overlooked – that it could be written at all. The fact that information covering more than half a century on food purchases by households, and on consumption by individuals, as well as on their nutrition status, is available in a systematic and comparable way is remarkable.

In common use, the phrase ‘nutrition policy’ is taken to mean those actions that governments take to influence people’s health through food, nutrition and, increasingly, physical activity. What is not usually considered part of ‘policy’ are the fundamental underpinning programmes of evidence-gathering that permit rational decisions to be taken. Such evidence-gathering encompasses primary research, secondary research (the synthesis of existing published evidence such as in systematic reviews) and surveillance. It is, nevertheless, precisely this background activity that makes a robust evidence base for policy – although it is a different matter whether policy making always draws rationally on it!

It was during the Second World War that the blossoming nutrition science was first applied in a major way to developing food policy. The Nutrition Society was formed with the specific aim of ensuring that food policy was based on sound science. The resulting food policy, led by luminaries such as Frank Young and Jack Drummond, was so successful that the British Ministries of Health and Food were jointly awarded the prestigious American Lasker Prize for Public Health. A central component of this policy was surveillance of the British food supply and the establishment in 1940 of the National Food Survey, which survives today as the Expenditure and Food Survey. Despite technical methodological changes, we can trace trends in food and drink purchasing patterns for over 60 years, allowing unrivalled insights into the variability of the national diet over time. It has proved more difficult to identify the drivers of change and harness them in the interest of public health.

After the end of the War, the Ministry of Food, which had developed as an outcrop of the Department of Health, was subsumed within the new Ministry of Agriculture, Fisheries and Food – so pointedly transferring its centre of gravity from a health perspective to an agro-industrial one. After rationing ended in the early 1950s, nutrition policy comprised the remnants of wartime endeavours, such as fortification of flour and margarines, with an underlying intent of preventing micronutrient deficiencies. With the emergence of chronic diseases, in particular coronary heart disease, as public health problems during the 1960s, the focus of nutrition science began slowly to shift towards its role in their pathogenesis and prevention. A series of authoritative reports from the USA and UK began to highlight the importance of nutritional factors in coronary heart disease, but policy action based on the science was slow. It was not until the Health of the Nation strategy, conceived under Mrs Thatcher’s government, and launched in 1992, that Britain experienced a public health policy incorporating specific nutritional targets. This was made possible only because of the rigorous collection of primary science, reviewed by authoritative scientists in the form of the Committee on Medical Aspects of Food (and Nutrition) Policy, and its systematic incorporation in the government’s decision-making process. It is notable that the successful implementation of the strategy relied on particular individuals being in post as Chief Medical Officer and as Secretary of State for Health. When these champions of the strategy were succeeded, the priority for these public health policies began to dissipate.

Today’s policies, such as *Choosing Health: Making Healthy Choices Easier*, depend on this background. Without the wisdom and foresight of the nutritionists of the last half of the 19th century, we would not have the ability to develop rational policy now. The preservation of systematic information-gathering as a background to policy should remain an explicit goal of key institutions such as the Food Standards Agency. However, we should not assume that all high office holders will appre-
ciate the long-term benefits of investing in nutrition research and surveillance. We should remain vigilant.

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This Foreword is dedicated to the memory of Dr Petra Clarke (1938–2007), Doctor and Civil Servant.

**Foreword by Dr Juliet Gray**

My time as Science Director of the British Nutrition Foundation (BNF) in the early 1980s just happens to represent roughly a half way point in the 40-year period that is marked this year by the publication of this latest Briefing Paper, documenting *Food Availability and Our Changing Diet*. It was a time when, as the Briefing Paper alludes to, we were beginning to recognise the significance to health of the immense social change that UK society was undergoing and when the associations between diet and health were receiving increasing attention. It was also a time before the discipline of public health nutrition was officially recognised and long before ‘evidence-based science and medicine’ and ‘functional foods’ became ‘buzz’ phrases. I say ‘UK’ quite deliberately, because the early 1980s represented an era before opinions in Brussels began to dominate and when it was the Ministry of Agriculture, Fisheries and Food and not the European Union to whom we deferred on matters of food legislation.

However, it was also the moment when the broader significance of dietary change within a European and an international context was gaining recognition. Thus, I felt that I had truly been ‘thrown in at the deep end’ when almost my first task was to tackle the emerging issue of Dietary Guidelines, their international perspective, their role within the bounds of the Common Agricultural Policy and whether qualitative guidelines were more or less appropriate than numerical goals. Our monograph *Implementation of Dietary Guidelines – Obstacles and Opportunities* (BNF 1982) concluded that qualitative guidelines were a more realistic approach than numerical goals, at least at that time. Today the Food Standard Agency’s (FSA) *Eight Tips for Eating Well* are very similar to these early guidelines, although we have indeed moved towards numerical goals in relation to fat, salt and sugar intake.

The Briefing Paper series was also begun in this era. The first, *Snack Meals – Trends and Effects* (BNF 1980), investigated the relatively new trends of ‘snacking’ and ‘fast foods’ and stressed the importance of ‘variety and moderation’; it is a message that still appears to be worth restating today, when the public is in danger of being swamped by apparently conflicting messages. The next and more controversial issue to be tackled as a Briefing Paper and one that aroused considerable media interest was *Salt in the Diet* (BNF 1981). As well as putting the then limited clinical and experimental evidence for the association between sodium intake and hypertension in context, we aimed to demonstrate the essential functional role of salt in food processing. More than 20 years on, it seems that this latter message is still sometimes overlooked but, against a backdrop of stronger clinical evidence of the link between sodium and hypertension, it is pleasing that the food industry has worked closely with bodies such as the BNF and the FSA gradually to reduce salt levels in foods and food products where appropriate and feasible.

The new Briefing Paper also picks up on issues relating to food additives, pesticides and fertilisers. The early 1980s was the era when ‘E numbers’ were first assigned to the additives approved within Europe. Thanks to a popular book suggesting that such E numbers might be detrimental to health, we spent a considerable amount of time emphasising that ‘natural’ may not equate with safe and correspondingly that additives were not unsafe for the majority of people. Today this is still a controversial area. There is perhaps somewhat better evidence to confirm that a minority of individuals may show sensitivities to certain preservatives (benzoates and sulphites) and particular colourants. Yet there continues to be irrational consumer responses to the presence of ‘E numbers’ in foods. Furthermore, as the Briefing Paper indicates, consumers now have a far greater voice and, in part, are leading changes in food; consequently, irrespective of science, large sectors of the industry are now removing additives from products where feasible.

So how far have we moved in the last two decades? From a positive standpoint we have made significant progress in educating and informing the public about food and nutritional issues, thanks to the ongoing work of the BNF and other bodies such as the FSA, considerable government investment and the increasing numbers of registered public health nutritionists. In this context, the increasing awareness of both the 5 a Day fruit and vegetables message (not incidentally a specific nutrition education message in the early 1980s), and of the association of salt with high blood pressure, is testament to the success of some public education programmes, although, of course, awareness does not always equate with behavioural change. On the other hand, such apparent successes must be considered against a background of exponential increases in rates of obesity, as indicated in the new Briefing Paper, with about 23% of...
UK adults now classified as obese compared with estimates of about 7% when I first entered the world of what we now call public health nutrition at the BNF. It is predicted that by 2020 obesity and type 2 diabetes will have reached epidemic proportions. Let us hope that when the BNF reaches its 50th anniversary we will be in a position to report that current public health and food policies will have been successful in halting the relentless increases in these diet-related chronic disorders.

Juliet Gray
Consultant Nutritionist, 3 Hurley Gardens, Guildford, Surrey, UK

Timeline

<table>
<thead>
<tr>
<th>Decade</th>
<th>Political/societal events</th>
<th>Nutritional reports/regulations</th>
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<tbody>
<tr>
<td>1940s</td>
<td>Second World War (1939–1945); WFS introduced (1940); Rationing begins (1940); Labour Government (1945); Heathrow airport opens (1946); First self-service supermarket opens (1947); Winter of discontent (1947); National Health Service established (1948)</td>
<td>Mandatory fortification of margarine with vitamins A and D began (1942); National Food Survey established (1940); Nutritional standards for school meals introduced (1941); First Food Labelling Order (1944); First Proceedings of the Nutrition Society published (1944)</td>
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<td>1950s</td>
<td>Conservative Government (1951); London smog kills 4000 Londoners from respiratory disease (1952); Watson and Crick publish the structure of DNA (1953); Coronation of Queen Elizabeth II (1953); End of rationing (1954); Treaty of Rome establishes EEC and CAP (1957); 24% of households own a fridge</td>
<td>Nutritional allowances set by BMA (1950)</td>
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<td>1960s</td>
<td>31% of households owned one or more cars (1961); Labour Government (1964); The miniskirt (1966); Eligibility of WFS was restricted to those who received some form of benefit (1968)</td>
<td>Bread and Flour regulations (1963); Launch of the first margarine rich in polyunsaturated fatty acids (1964); British Nutrition Foundation established (1967); COMA established (1968); Recommended Nutrient Intakes set by COMA (1969)</td>
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<td>1970s</td>
<td>General Household Survey started (1970); Conservative Government (1970); Decentralisation (1971); Energy crisis (1973); 3-day week (1973); Labour Government (1974); UK accession to EEC and became part of CAP (1973); Drought (1975/76); Conservative Government (1979); 40% of households own a freezer (1979)</td>
<td>Burkitt hypothesis – emphasis switching to preventative nutrition (1972); COMA report on Diet and Heart Health (1974); Recommended Daily Amounts set by COMA (1979)</td>
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<td>1980s</td>
<td>The Black report highlights inequalities in health (1980); Andreisson CAP reform introduces milk quotas and voluntary set-aside (1987/88); Salmonella food scare (1988); 50% of households own a microwave</td>
<td>Food-based guidelines replace nutritional standards for school meals (1980); NACNE report published (1983); COMA report on Diet and Cardiovascular Disease (1984); Introduction of foods with a healthier nutritional profile, e.g. low fat, reduced sugar (1985); COMA report on Dietary Sugars and Human Disease (1989)</td>
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<td>2000s</td>
<td>FSA established (2000); EU enlargement (2004); National School Fruit and Vegetable scheme rolled out across primary schools (2004); Choosing Health – Making Healthier Choices Easier published (2004); Healthy Start scheme launched to replace the WFS (2006); School Food Trust established (2006)</td>
<td>COMA report on Folic Acid and the Prevention of Disease (2000); Establishment of SACN (2000); Reintroduction of nutritional standards for school meals (2001); SACN report on Salt and Health (2003); SACN report on Folate and Disease Prevention (2006); DH Healthy Living Strategy introduced (2007)</td>
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Abbreviations: BMA, British Medical Association; CAP, Common Agricultural Policy; COMA, Committee on the Medical Aspects of Food (and Nutrition) Policy; DH, Department of Health; EEC, European Economic Community; EU, European Union; FSA, Food Standards Agency; NACNE, National Advisory Committee on Nutrition Education; SACN, Scientific Advisory Committee on Nutrition; WCRF, World Cancer Research Fund; WFS, Welfare Food Scheme.
Introduction

This Briefing Paper has been published to mark the 40th anniversary of the British Nutrition Foundation (BNF). The BNF was established in 1967 to promote and encourage research and education in the field of nutrition and to disseminate information on nutritional topics (Frazer 1968). Over the past 40 years, the original objectives of the Foundation have only been slightly modified to reflect the changes in the field of food and public health nutrition. Yet, as documented in this Briefing Paper, the substantial changes have meant that the need for education in the field of nutrition and the dissemination of information on nutritional topics is possibly greater now than it was in 1967.

Advances in nutrition science have demonstrated the importance of a good diet for good health; a balanced and varied diet can help to maintain a healthy body weight, enhance general wellbeing and reduce the risk of a number of diseases, including heart disease, stroke, cancer, diabetes and osteoporosis. In 21st century Britain, food is plentiful and food choices are driven by a wide range of social, economic and environmental factors. However, this has not always been the case. During the early 1940s, individual food choice was largely forced by availability, which was controlled by local produce and what food imports eventually reached the harbours. The ‘technological revolution’ of the post-war period then became an important influence in widening the range of foods available, which became vaster each decade as domestic appliances became more affordable and the food industry developed new products to make the most of the ‘modern’ technology available to the consumer. In 1973, the UK signed up to the Common Agricultural Policy (CAP), which has since strongly influenced the price of many staple foodstuffs and shaped the agricultural industry. The 1970s proved to be a turbulent decade for the UK, with year-on-year price inflations being the highest ever recorded. The global oil crisis in 1973 had substantial implications for the overall economy; meanwhile, the drought from 1975 to 1976 was another blow to the farming industry. These political, social and environmental events affected what foods were available, which in turn influenced food consumption.

The health agenda became an important determinant of food availability during the 1980s, perhaps influenced by the publication of food and nutrient guidelines. By the mid-1980s freezers were in many households, but the sales of microwave ovens were particularly rapid and they became ubiquitous in most houses during the 1980s. Foods designed for the freezer and microwave ovens made it easier and quicker to prepare a meal than ever before—a cause, or an effect, of convenience becoming an important influence on food choice. Another milestone during this decade was the popularity of supermarkets; by now they had majority share of the food retail market. The popularity of supermarkets continued to grow in the 1990s, along with the number of stores and size of store.

By 1990, other food and health issues had emerged, including organics and environmental concerns around packaging and waste. As the environmental impact of the CAP reforms of the 1980s was being debated, the reformed scheme continued and new quota schemes were introduced for the livestock and dairy sectors as well as for arable crops and sugar beet. The BSE food scare hit the headlines between 1995 and 1996 and had a substantial impact on livestock farmers and producers, as some consumers reacted by excluding beef from their diet. This food scare, in particular, contributed to the decision to form an organisation to govern food standards and protect consumer interests, a role previously assigned to the Ministry of Agriculture, Fisheries and Food (MAFF), which also had the responsibility for promoting the economic interests of the food industries. In order to disentangle these two potentially conflicting roles, the Food Standards Agency (FSA) was set up in 2000.

The past 7 years has continued to see much activity in the field of public health nutrition and food. The public health White Paper published in 2004 reiterated the government line that people are each responsible for their own health and wellbeing. Therefore, much activity has focused around providing consumers with more information to enable them to make informed decisions.

A number of interrelating factors affect what foods we chose to eat, as illustrated in Figure 1. Unfortunately, the collection of data surrounding some of these issues (e.g. food knowledge and family practices), and the impact they have on diet, has been ad hoc over the past 60 years, making it difficult to report on changes to these factors. However, modifications to food availability and access are reported on in Section 4 and the impact of some of these changes can be seen in patterns of food consumption and nutrient intake, reported in Section 3. In turn, the benefits of the healthier diet are evident from the life expectancy and disease incidence statistics discussed in Section 1, which are reflected in the transition of the government’s nutrition and health agenda summarised in Section 2.

1This Briefing Paper documents some of the significant events in the field of food, nutrition and health from the 1940s, to take account of rationing and the formation of the National Health Service.
Section 1: The interaction between diet and public health

1.1: Changing patterns of mortality in the UK

Disease patterns and mortality rates in the UK have changed considerably since the Second World War. In line with trends that have been evident throughout the 20th century, average life expectancy has been increasing year on year, rising from approximately 71 years for males and 76 years for females in 1940, to 79 years for males and 84 years for females in 2005 (Fig. 2; ONS 2000; ONS 2006a).

The improvements in life expectancy over the past 100 years have been largely a result of the control of infectious disease and falls in death rates from causes such as coronary heart disease (CHD), stroke and lung cancer in men (see Fig. 4). These factors have contributed...
to an ageing population in the UK with 16% of the population aged 65 and over in 2005, compared with only 8% in the 1940s (ONS 2006b). ‘Healthy’ life expectancy, however, has not increased at the same rate, carrying considerable implications for quality of life and associated costs to the National Health Service (NHS).

The focus of public health nutrition is now turning towards improving health and quality of life in later years. Ageing is the result of a lifelong accumulation of molecular damage in the cells and organs. Lifestyle and environment have the potential to determine the rate at which damage to cells is accumulated (Kirkwood 2006). Risk of chronic disease is influenced not only by adult life experiences, but also by exposure to risk factors in early life and onwards, so a life-course approach to minimising the effects of ageing is important. Consequently, there has been a switch in the perception of health issues in the last 60 years. No longer are health professionals just concerned about reducing mortality from chronic diseases; public health emphasis is switching to ensure that added years of life are spent in as good health as possible. This can then reduce the number of days lost through certified sickness as a result of diet-related ill-health, and the cost to the NHS of providing inpatient care, general practitioner visits, prescriptions and community care for diet-related conditions (DH 2003).

In addition to this increase in life expectancy, the population of the UK has also increased from approximately 40 million in 1940 to over 60 million today (ONS 2007; Fig. 3). However, during this time, there have also been significant changes in fertility patterns in the UK characterised by a fall in fertility rates, rising mean age at first birth and higher levels of childlessness. The fertility rate is defined as the average number of children a woman would have if she experienced the age-specific fertility rates of a particular year for her entire childbearing years. It is a particularly useful way to assess the birth rate within a population as it standardises for the changing age structure of the population. In 2005, the mean age of women having their first birth was 27.3 years. This was a rise of 3.6 years from 1970 and 2.8 years from 1960. Nearly 1 in 5 women in their mid-forties in 2005 (i.e. those born around 1960) were childless. This compares to 1 in 10 women born in the mid-1940s who were childless at the same age (ONS 2006c).

Throughout the 20th century, there have been large fluctuations in the number of births in the UK. Peaks in the numbers of births occurred after both world wars.
the 1960s, there was a more sustained ‘baby boom’, with births rising to a peak of 1,014,700 in 1964. This was followed by a rapid decline in the numbers of births, reaching a low of 657,000 in 1977. The large numbers of women resulting from the 1960s ‘baby boom’ contributed to a rise in births in the late 1980s and early 1990s. Subsequently, births fell to 669,000 in 2001 and 2002. Since then, with rising fertility rates, births have been rising again. In 2005, there were over 722,500 births in the UK, an increase of 6,600 on the previous year (ONS 2006c).

Since the 1940s, there has been a huge shift in the burden of disease in the UK. In line with trends originating at the turn of the 20th century, age-standardised mortality from all causes of death has fallen dramatically in both males and females, as illustrated in Figure 4 (ONS 2005). During the earlier part of the century, this was caused by large declines in mortality from infectious diseases and, more recently, from heart disease and stroke.

1.2: Changing patterns of disease and links with diet

Figure 5 shows the main causes of premature deaths (i.e. deaths before the age of 65) in the UK in 2004 (Baker et al. 2006).

Evidence indicates that these chronic diseases (cancer, CHD and stroke) can be diet-related. A good diet is vital to good health; a balanced and varied diet can help to maintain a healthy body weight, enhance general well-being and reduce the risk of certain chronic diseases. (Although, it is important to note that these diseases are multifactorial in nature.)

As outlined in this section, the incidence of these diseases has varied over the last 60 years. Dietary change may well have driven some of the fluctuations in

![Figure 4](image-url) Age-standardised mortality rate for all causes, by sex, England and Wales (Source: ONS 2005). CHD, coronary heart disease.

![Figure 5](image-url) Major causes of premature death (before age 65 years) (Source: Baker et al. 2006). CHD, coronary heart disease.
disease rates that have occurred over the past decades, but are by no means the sole driving force.

**Cardiovascular disease**

Cardiovascular disease (CVD) describes diseases of the heart and cardiovascular system (e.g. CHD, stroke; ICD-10 codes 100–199). Death rates from CVD have fallen since the early 1970s. However, with more than 37% of the UK population dying from CVD, it remains one of the main causes of death in the UK, accounting for just over 216 000 deaths in 2004 (BHF 2006; Fig. 6). Additionally, despite falling CVD death rates, the number of people suffering from CVD has not declined (as people are living longer) and this has implications for quality of life and costs to the NHS.

A diet that is high in total fat, saturates and salt, and low in dietary fibre and fruit and vegetables, increases the risk of CVD. Indeed, it has been estimated that up to a third of all deaths are attributable to dietary risk factors (Frayn & Stanner 2005). Clear dietary targets to reduce rates of CVD in the UK population were established by the government in 1974 and then reassessed and amended in 1984, 1994 and 2004 (DH 1994a, 2004b; DHSS 1974, 1984; see Section 2.3).

A recent study attempted to explain the decline in mortality from CHD over the last two decades of the 20th century in Britain. Combining and analysing data on uptake and effectiveness of cardiological treatments and risk factor trends, the authors reported how much of the decline in CHD mortality in England and Wales between 1981 and 2000 could be attributed to medical and surgical treatments and how much to changes in cardiovascular risk factors. They concluded that 58% of the CHD mortality decline in Britain during the 1980s and 1990s was attributable to reductions in major risk factors, principally smoking and diet. Treatment of individuals, including secondary prevention, explained the remaining two-fifths of the mortality decline (Unal et al. 2005).

**Cancer**

In the UK in 2004, there were 153 397 deaths from cancer (ONS 2004). In the 30-year period between 1975 and 2004, the age-standardised mortality rates for all malignant neoplasms fell by 15% from 215 to 183 per 100 000 of the population. Male mortality rates have been consistently higher than female mortality rates but have decreased more quickly, by 21% and 11%, respectively (Fig. 7).

Observational studies comparing rates of cancers in different populations detected occupational and environmental factors associated with increased risk of developing cancer. These observations formed the basis of Doll and Peto’s statement that the overall involvement of dietary factors in the development of cancers at
all sites was comparable to that of tobacco smoke (Doll & Peto 1981).

After a great deal of research, diet is now considered an important determinant of risk for certain cancers, such as colorectal cancer. However, for cancers at other sites, such as lung cancer, diet plays a relatively small part in determining the likelihood that an individual will develop the disease, and other factors, including smoking, are better predictors of risk (WCRF 1997). To date, very few definite relationships between dietary factors and cancer risk have been established; however, this has not stopped numerous foods and food components being branded the new ‘superfood’ against cancer. In most cases, the strength of the message portrayed by the media and some health professionals is greater than the strength of the evidence associating diet with cancer risk. Overall, it has been estimated that approximately 30% of cancers could be prevented by dietary means in countries such as the UK (Doll & Peto 1981).

Cancer risk can be decreased by avoiding overweight/obesity, increasing physical activity level, limiting alcohol intake and not smoking (Key et al. 2004; see Miles 2007). However, as mentioned earlier, few dietary effects on cancer have been firmly established. Fruits and vegetables (400 g/day) probably have a modest impact on decreasing the risk of cancers of the oral cavity, oesophagus, stomach and colon/rectum (Williams 1995; WCRF 1997), although the apparent strength of this association has been weakened recently after publication of some large studies (Smith-Warner et al. 2001). A modest effect on lung cancer risk has also been proposed, which is mostly attributable to fruit, but of course the primary risk factor is tobacco use. High intakes of red and, in particular, preserved or processed meats probably increase the risk of colorectal cancer, while a high fibre intake is thought to be protective. Fish consumption has been shown to be significantly inversely associated with risk in the European Prospective Investigation into Cancer and Nutrition study (Norat et al. 2005).

**Obesity**

Obesity is arguably one of the most pressing public health issues facing the UK today, and has been since 1976, when it was deemed ‘... to constitute one of the most important public health problems of our time’ (Waterlow 1976). Rates of obesity have increased dramatically over the last decade among all ages of the population. Given the known relationship between obesity and other serious chronic diseases such as type 2 diabetes and CVD, preventing and treating obesity has become a major public health goal.

The rapid increase in the prevalence of childhood obesity across the UK is particularly alarming. During the period 1995–2004, the prevalence has increased in English boys, aged 11–15 years, from 14% to 24% and in girls from 15% to 26% (DH 2005a). In the younger age group, 2–10 years, 16% of boys and 11% of girls (average of 14.3%, i.e. 750 000 children) were obese in 2004 compared with 10% of each in 1995.² Similar trends have been seen in Scotland over the past 5 years, prevalence of obesity in the age group 10–12 years has increased by 3% (ISD Scotland 2006). Of particular concern is the recognition that the rate of increase seems to be rising, which suggests that the prevalence in adulthood is set to increase further unless action is taken. By

²The increase in obesity in girls aged 2–10 years was not statistically significant, but the other changes were.
2010, it is estimated that 19% of boys and 22% of girls aged 2–15 years in England will be obese (and a further 14% of boys and 14% of girls overweight) (DH 2006a).

Unfortunately, there is a lack of data from nationwide surveys outlining the prevalence of obesity in the UK over the decades prior to 1990s. For example, the Health Survey for England was only established in 1990 and so data available prior to this date are sporadic (Table 1).

Population averages are useful to highlight the increasing prevalence but hide the variations among subgroups of the population. For example, there are marked social class differences in obesity prevalence in women but not in men and there is substantial variation in obesity prevalence rates in certain ethnic minority groups (DH 2006b).

When body weight increases, metabolic changes occur, bringing about increased insulin resistance and risk of type 2 diabetes. Thus, as would be expected, the prevalence of type 2 diabetes is also increasing, having more than doubled in men and increased by 80% in women since 1991. Type 2 diabetes substantially increases the risk of developing CHD: men with type 2 diabetes have a 2- to 4-fold greater annual risk and women an even greater risk (3- to 5-fold) (BHF 2006). It also magnifies the impact of risk factors for CHD, for example obesity, smoking and raised blood pressure and blood cholesterol.

Infectious diseases

Sharp peaks in mortality in the UK occurred around the First World War (1914–1918), when deaths were mainly caused by infectious diseases. Such diseases now account for a relatively small proportion of all deaths. For those aged under 65 years, the reduction in infectious diseases was the most important cause of the decline in overall mortality over the 20th century. It declined for those aged under 15 years over this period and substantially for those aged 15–64 years after the Second World War.

Trends in infectious diseases have changed significantly over the last 30 years (Fig. 8). Although the occurrence of these illnesses fluctuates far more than for other types of health problems, as a result of epidemics, occurrence of the types of infectious diseases that children tend to suffer from has declined. While in 1971 there were about 155 000 cases of measles in the UK, by 2000 there were only 3000. Similarly, there were 900 cases of whooping cough (pertussis) in 2000, compared with the peak incidence of 71 000 in 1978 and 1982. In these cases, there is a link with immunisation. For example, owing to concerns about the safety of the pertussis vaccine in the mid-1970s, immunisation declined and incidence soared. As confidence in the vaccine was restored, uptake increased and incidence began to decline. In the mid 1970s, the uptake of

Table 1 Percentage of UK population classified as obese since 1983, by country

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Men</th>
<th>Women</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>1983</td>
<td>6</td>
<td>8</td>
<td>RCP (1983)</td>
</tr>
<tr>
<td>Scotland</td>
<td>1995</td>
<td>16</td>
<td>17</td>
<td>The Scottish Executive (2005a)</td>
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<tr>
<td>Scotland</td>
<td>1998</td>
<td>18</td>
<td>21</td>
<td>The Scottish Executive (2005a)</td>
</tr>
<tr>
<td>Scotland</td>
<td>2003</td>
<td>22</td>
<td>24</td>
<td>The Scottish Executive (2005a)</td>
</tr>
<tr>
<td>England</td>
<td>2004</td>
<td>23</td>
<td>23</td>
<td>DH (2005a)</td>
</tr>
</tbody>
</table>

Figure 8 Notifications of selected infectious diseases in the UK since 1970 (Source: ONS 2002).
the measles vaccine amongst eligible children was around 50%; by 1988 this had risen to 80%, and after that point the number of notifications of measles fell dramatically (ONS 2002).

**Food poisoning**

Microorganisms responsible for food-borne disease can be transmitted from person to person and through food itself. Today the overall mortality from food poisoning is very small (Garbutt 1997) and, in terms of other public health issues, it could be considered relatively trivial. For example, the risk of someone dying in any 1 year from food poisoning (all forms) is relatively low – 1 in 100 000 – compared with the risk of someone dying from cancer – 1 in 290 (Gray 2000).

Laboratory-identified cases of food poisoning continue to be collected from a variety of sources and compiled by the Health Protection Agency. However, a large number of cases go unreported, the percentage of which depends on the organism. For example, it is suggested for every one case of *Clostridium perfringens* reported, there are 343 other cases in the community, compared with *Escherichia coli* 0157, of which nearly all cases are reported (POST 2003; Fig. 9).

However, it is widely agreed that there has been a genuine increase in food poisoning, for a number of reasons including: increasing globalised food market; emergence of new diseases; and changing social patterns, such as storing food for longer, increasing use of pre-prepared foods and eating out more often (DH 2002a). Meanwhile, the recent declining trend is attributed to initiatives such as the vaccination of poultry to curb the spread of salmonella and more recently the hygiene regulations and inspection of abattoirs, to be undertaken by the Meat Hygiene Service.

**Section 2: The role of government**

Government-led policies that are related to food and nutrition provide important signals to the food industry, public, health professionals and the media. The government also has a vital role to play in providing expert advice and information on nutrition and food related topics. Sixty years ago, only one department was responsible for food and nutrition across the UK – the Ministry of Food. In 1955, when the Ministry no longer existed, the responsibilities for food, diet and nutrition were divided across several agencies/departments, as outlined in this section, although perhaps the most significant ‘signals’ have originated from expert committees, namely the Committee on Medical Aspects of Food and Nutrition (and Nutrition) Policy (COMA).

Since 1997 there have been changes to the extent of the responsibility of the UK parliament and government departments across Scotland, Wales and Northern Ireland. There has been a transfer of powers in devolved matters, and they have established parliaments independent of Westminster. This report has attempted to take these changes into account, although due to the timing, this was not possible in the case of Northern Ireland.

2.1: Overview of government departments related to food and nutrition

**Ministry of Food (1939–1955)**

The Ministry of Food was set up in 1939 to deal with the problem of providing a nutritionally adequate diet.
for people in Great Britain during the Second World War (Fisher 1977). It played an important role, being the first organisation responsible for a nutrition policy (Disselduff 1983). The Ministry controlled all food supplies, food reserve stocks and distribution, and had local and regional committees to give expert information and organise the use of gardens, waste land and allotments for producing food locally (Fisher 1977). The Ministry became a permanent Department of State in 1946 until 1955, when it was subsumed within the Department for Agriculture and Fisheries to become MAFF (Archives Network Wales 2007).

Ministry of Agriculture, Fisheries and Food (1955–2000)

MAFF was responsible for a range of food-related issues, including food standards and safety and food surveillance, and MAFF worked closely with the Food Advisory Committee (1983–2000), which provided advice on UK’s policy on food safety and quality and subsequent regulations. MAFF was also concerned with the nutritional content of food and the nation’s diet, as well as the organisation of dietary surveys, namely the National Food Survey (NFS; see Section 3.1). During its lifetime, MAFF had an important role in promoting the economic interests of the food industries; however, it was felt that this function was in conflict with its responsibility to guarantee high standards in food hygiene in order to protect public health. This duality of function was one of the reasons cited for disbanding MAFF (MAFF 1998). The responsibilities of MAFF were split between the newly formed Department for Environment, Food and Rural Affairs (DEFRA) and the FSA.

Food Standards Agency (2000–present)

The rising incidence of food-borne illness during the 1990s, as shown in Figure 9, was one of the concerns that influenced the formation of an independent organisation to govern food standards. Of particular importance was the incidence of food-borne diseases (namely the BSE crisis, which received much attention during 1995–1996; FSA 2007a). From 1997, the Food Advisory Committee had a special role in the handling of food safety issues during an interim period in which the Food Standards Act (1999) established the FSA. Since 2000 the FSA has a package of statutory powers, in order to strengthen enforcement of food standards to protect consumer interests (OPSI 1999). The FSA also has an important role in making it easier for all consumers to choose a healthy diet by providing information and encouraging the food industry to clearly label foods. It also oversees the management of the National Diet and Nutrition Survey (NDNS; see Section 3.1). Each of the devolved regions has their own branch that focuses on food issues within their region.

Department for Food and Rural Affairs (2000–present)

DEFRA’s role in nutrition research lies primarily in its sponsorship role for the food industry, facilitating industry’s ability to deliver ‘positive’ nutrition in a form acceptable to consumers. DEFRA was also given responsibility for continuing the NFS (see Section 3.1).

Department of Health (1919–present)

The Department of Health (DH), originally known as the Ministry of Health (1919–1968) and subsequently Department for Health and Social Security (1968–1988), has also had responsibility for health-related nutrition issues. Since 1999 the Assembly of each of the devolved regions has had power to devise and implement health policies across their region, and this is led by the Scottish Executive Health Department and the Department for Health and Social Services in Wales, respectively.

Across the UK, expert committees (e.g. COMA) have always been employed to advise government on specific nutrition and health-related issues, and the findings of such committees (see below) have strongly influenced nutrition policy.

Committee on Medical Aspects of Food (and Nutrition) Policy (1963–2000)

The Committee on Medical Aspects of Food (and Nutrition) Policy was set up in 1963 as an independent source of advice to the government regarding diet and nutritional surveillance (DH 2000a). Although it should be noted that the government did not always endorse the COMA recommendations. Fifty reports were published by the committee, until it was disbanded in March 2000, when a new committee, the Scientific Advisory Committee on Nutrition (SACN), was set up. Between 1998 and 2000, the committee was referred to as the Committee on the Medical Aspects of Food and Nutrition Policy.
Scientific Advisory Committee on Nutrition (2000–present)

SACN was established to review existing arrangements for scientific advice on nutrition (DH 2000a). Since 2000, the Committee has been advising government on scientific aspects of nutrition and health, including: nutrient content of individual foods and advice on diet as a whole; the nutritional status of people; and wider public health policy issues, including conditions where nutritional status is one of a number of risk factors (e.g. CVD, cancer, osteoporosis and obesity) (SACN 2007). Unlike COMA, advice from the SACN is used to assess and inform nutrition issues, and subsequent policy decisions, rather than be adopted as policy per se.


The remit of education has been under the auspices of four departments since the 1960s, including the Department of Education and Science (1964–1992), the Department of Education (1992–1995), and the Department for Education and Employment (1995–2001). In 2001, the UK Department for Education and Skills (DfES) was established. However, following a change in leadership in June 2007 it was split into two departments: the Department for Children, Schools and Families (DCSF) and the Department for Innovation, Universities and Skills. In terms of food and nutrition, the DCSF is responsible for food in schools and setting the curriculum content, as outlined in Section 4.1. The Scottish Executive Education Department and Department for Education, Lifelong Learning and Skills in Wales are responsible for such issues across Scotland and Wales, respectively.


The Health Education Authority (HEA) was founded in 1987 and was largely funded by the DH. Its remit included providing evidence for policy decisions and developing resources for health professionals and user-friendly information for the public (OPSI 1987). Coinciding with the dismantling of the HEA in 1999, and in line with commitments made in the White Paper Saving Lives: Our Healthier Nation (DH 1999), the Health Development Agency (HDA) was set up. The HDA worked in partnership with professionals and practitioners across a range of sectors throughout England and Wales (including food and nutrition) to commission research. It was the role of the HDA to translate the research findings and other evidence into guidance in order to support delivery of programmes to improve health and tackle health inequalities, and setting of standards (NICE 2007).

National Institute for Health and Clinical Excellence (2005–present)

As a result of the DH’s 2004 review of its ‘arms length bodies’ (DH 2004a), the functions of the HDA were transferred to the National Institute for Health and Clinical Excellence (NICE) on 1 April 2005. Originally, NICE was established to focus on developing guidance for clinical practice across England; however, with the closure of the HDA, a Public Health Team was set up to develop much needed public health intervention guidance and public health programme guidance. NICE added ‘Health’ into its name in recognition of this merger, although the acronym remained the same.

2.2: Recommendations for healthy diets

Dietary reference values

Today, population-wide nutritional recommendations are useful for the evaluation of surveys of food consumption and thus in the identification of subgroups of the population that may be at risk of nutrient deficiency, as well as a guide for caterers and dietitians when planning diets for groups of healthy individuals. Recommendations are set in one of two ways. First, there are recommended nutrient intakes that state a desired level for population intakes of the major nutrients in the diet. Alternatively, food-based dietary goals or guidelines can be set that help consumers to choose foods that are most likely to bring about improvements in long-term health. Such guidelines include advice to ‘eat more whole grain foods’ or to ‘cut down on salt’.

The concept of dietary recommendations dates back to the 17th century, when a set of ‘victualling allowances’ based on food groups was developed to ensure that England had an effective navy at minimal cost. Indeed, many subsequent recommendations were made on the basis of fitness for purpose, attempting to prevent starvation in the unemployed population. The transition from a focus on foods, to nutrients, came during the First World War, when recommendations for energy and protein were made for the benefit of the army, and these standards were later developed by the British Medical Association (BMA) to maintain health and working capacity during the post-war depression. The term recommended daily allowance (RDA) was first coined by the
National Research Council of the United States in 1945 and it was this concept that was further developed by the BMA’s Committee on Nutrition when they published a table of recommended nutritional allowances for 10 nutrients (protein, fat, calcium, iron, vitamin A, thiamine, riboflavin, nicotinic acid, vitamin C, vitamin D) and energy (BMA 1950). Daily allowances varied depending on age, sex and activity level of the individual.

In the period since 1950, the UK dietary recommendations have been modified on several occasions in an attempt to better define an adequate intake for the population (DH 1991; DHSS 1969, 1971, 1979a; Fig. 10). In line with the 1950 report, the 1969 and 1979 reports based their recommendations on single figures, defined as recommended daily intakes (RDIs) and recommended daily amounts (RDAs), respectively, and carried the potential for misuse and misinterpretation. They were set deliberately high (compared with average requirements) to minimise the risk of undernutrition and were designed to apply to groups of people rather than individuals.

The values currently in use in the UK are dietary reference values (DRVs). These are a series of values that represented COMA’s best estimates of requirements for various groups, with the intention that these figures could be used as yardsticks for the assessment of dietary surveys and food supply statistics (Fig. 11). They were published in 1991 and the majority of the values set are still in use today. Although more recent consideration has been given to some nutrients, such as folate, selenium and iron.

**Dietary recommendations from government reports on diet and disease**

The Committee on Medical Aspects of Food (and Nutrition) Policy has also been asked to provide advice on a number of diet-related diseases and, in many cases, this had led to population-wide dietary recommendations. During the past four decades, the DH has published a number of Reports on Health and Social Subjects. Many of these reports have had a major influence on food and nutrition policy in the UK. Of particular note are four reports: *Diet and Cardiovascular Disease* (DHSS 1984); *Dietary Sugars and Human Disease* (DHSS 1989); *Dietary Reference Values for Food Energy and Nutrients for the United Kingdom* (DH 1991); and *Nutritional Aspects of...*
Cardiovascular Disease (DH 1994a). These reports were published around the time of a significant sea change in the provision of public health recommendations, attempting to quantify dietary change using nutrient targets rather than suggesting a general direction of change only. Dietary modifications were also recommended on the basis of prevention of disease, whereas reducing the incidence of nutritional deficiencies had previously been the main concern. Many of the reports also made recommendations about how these dietary changes could be facilitated, including a recommendation to label the saturates, polyunsaturates and even trans fatty acids on the packaging of butter, margarine and edible oils (DHSS 1984).

During this time, a report entitled A Discussion Paper on Proposals for Nutritional Guidelines for Health Education in Britain was prepared by the National Advisory Committee on Nutrition Education (NACNE) (1983). Although not directly associated with the government, NACNE (originally Joint Advisory Committee on Nutrition Education) was formed in 1979 under the aegis of the BNF and Health Education Council, at the recommendation of a 1978 Working Party on Nutrition Education, and with encouragement from the government. In 1983, NACNE published the discussion paper, within which it attempted to offer a comprehensive set of quantitative dietary targets for the prevention of a range of nutrition-related diseases. The targets set in the NACNE report were for a reduced consumption of fat, saturates, sugar and salt by the general population. This report was developed in parallel to the 1984 COMA report on Diet and Cardiovascular Disease (DHSS 1984). The two reports had similar recommendations, although the specific values differed (Table 2).

Guideline daily amounts

Guideline daily amounts (GDAs) for calories, fat and saturates were originally developed by the Institute of Grocery Distribution (IGD) in 1998 (IGD 1998) and have been used for some years by a number of retailers and manufacturers. The purpose of these GDAs was to support information provided in the nutrition panel on food packaging, and they were designed to help consumers put nutrition information into context (Table 3). The GDAs are an estimate of typical appropriate intake levels for subgroups, which are derived from the DRVs published in 1991 (DH 1991). These values are based on

Table 2 Recommended average nutrient intakes according to various reports since 1950

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</thead>
<tbody>
<tr>
<td>Total fat (% energy)</td>
<td>&gt;25%</td>
<td>34%</td>
<td>30%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Saturates (% energy)</td>
<td>15%</td>
<td>10%</td>
<td>15%</td>
<td>11%</td>
<td>11%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essential fatty acids (% energy)</td>
<td>1–2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n-6 polyunsaturated fatty acids (% energy)</td>
<td>6.5%</td>
<td>No ↑</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n-3 polyunsaturated fatty acids (% energy)</td>
<td>0.2 g/day</td>
<td>0.2 g/day</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>trans fatty acids (% energy)</td>
<td>2%</td>
<td>No ↑</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Dietary fibre</td>
<td>25 g/day</td>
<td>30 g/day</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Non-starch polysaccharides</td>
<td>18 g/day</td>
<td>18 g/day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Complex carbohydrates</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sugar</td>
<td>1 g/day</td>
<td>3 g/day</td>
<td>No ↑</td>
<td>60 g/day</td>
<td>6 g/day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-milk extrinsic sugars</td>
<td>3.5 g/day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>60 g/day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>8 g/day</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Short-term targets to be achieved by the end of the 1980s; †Long-term targets to be achieved by the end of the century. No ↑ = no increase; ↓ = reduction. BMA, British Medical Association; COMA, Committee on Medical Aspects of Food (and Nutrition) Policy; NACNE, National Advisory Committee on Nutrition Education.
recommendations made by COMA (Table 4); in general, very active individuals will have higher requirements and younger children typically lower. Individual nutritional requirements will vary depending on age, weight and variation in activity levels. GDAs are not targets; they are a guide, providing a benchmark suitable for the majority of people.

In 2005, the IGD decided to review and extend its range of GDAs for energy, fat and saturates, for men and women. GDAs have now been published for men, women, ‘adults’ and children, for the following nutrients: fat, saturates, protein, carbohydrate, total sugars, fibre, salt and energy (IGD 2005a).

Dietary guidelines
The growing concerns over the health implications of dietary trends resulted in the development of a more positive approach to nutrition, leading to the publication of recommendations for healthy eating. The first formal dietary guidelines for the UK were published in the *Eating for Health* document, published by the Department of Health and Social Security in 1978 and revised in 1979 (DHSS 1978, 1979b; Fig. 12). The guidelines, although initially criticised for being too general, have formed the basis of subsequent recommendations and the general themes can be identified in the *8 Tips for Eating Well* published in 2005 (FSA 2005; Fig. 13). Overall, the government’s key healthy-eating message is promoted through the *Balance of Good Health*, which is a diagrammatic representation of the types and proportions of different foods that make up a healthy, balanced diet (FSA 2002a; Fig. 13).

2.3: Nutrition-related health policies
From the early 1980s, prevalence of chronic disease, and the widening health inequalities gap, heightened the need for health improvement policies. During this period, several reports/guidelines were published, which set delivery objectives for relevant NHS services and health improvement teams across the UK and later for England, Scotland and Wales independently. Some of these reports also outlined the contribution the government expected of the private sector, such as the food industry, to improve public health.

The Health of the Nation (1992–1999)
The *Health of the Nation* strategy document was the first attempt by the DH to provide such a strategic approach to improve overall health in England, and set targets (DH 1992). Targets relevant to nutrition included:

- reducing the average percentage of food energy derived by the population from saturates by at least 35% by 2005 (from 17% in 1990 to no more than 11%);
- reducing the average percentage of food energy derived from total fat by the population by at least 12% by 2005 (from about 40% to no more than 35%);
- reducing the proportion of men and women aged 16–64 years who are obese by at least 25% and 33%, respectively, by 2005 (from 8% for men and 12% for women to no more than 6% and 8%, respectively).

The Nutrition Task Force was a multisector committee of senior individuals, set up under the auspices of *The
Health of the Nation (DH 1992). Most notably, the Task Force succeeded in bringing together representatives of many interested groups (including food manufacturers, retailers, caterers, health professionals and the voluntary sector) to work with government departments to produce and oversee a broad strategic and operational programme (Nutrition Task Force 1994). Four working groups were established to facilitate the development of a programme aimed at reaching The Health of the Nation dietary targets.

The Nutrition Task Force published its own targets and programme of action, entitled Eat well!, published in 1994, with a progress report published in 1996 (DH 1994b, 1996). In order to implement the Eat well! action plan, a number of project teams were established, each with a specific focus, including: hospital catering;
school food providers; nutrition training for caterers; product reformulation; and low income.

The outcomes of the project teams were varied and wide-ranging, and included leaflets, guidelines and handbooks, such as the following:

- *Obesity* (Nutrition & Physical Activity Task Forces 1995);
- *Low Income, Food, Nutrition and Health* (Nutrition Task Force Project on Low Income 1996);
- *Nutrition and Health: A Handbook for NHS Managers* (Nutrition Task Force Project on the National Health Service 1994);

However, not all the project teams were able to complete their work during the lifetime of the Task Force, although some topics were picked up again under the new Labour leadership.

**Health improvement policies – The White Papers (1999)**

*Towards a Healthier Scotland – A White Paper on Health* was published in 1999 and set out aims and objectives in order to improve health of Scots (Scottish Office 1999). *Saving Lives – Our Healthier Nation* (DH 1999) was seen as an ‘action plan’ for Great Britain and set targets to reduce deaths from the main killers: cancer, CHD and stroke, accidents and mental health. Recent trends indicate that the target set to reduce the death rate from CHD, stroke and related diseases in people under 75 years by at least two-fifths by 2010 will be met (see Section 1.1, Fig. 6). Reference to nutrition and health was made within two chapters of the document. However, specific targets were not made and initiatives to implement them, such as *Healthy Living Centres* and *Work Place Health*, had a broader focus than food and nutrition alone.


The Publication of the NHS Plan – A Plan for Investment, A Plan for Reform followed shortly after the White Paper in July 2000 (DH 2000b). The plan set out strategies for improving health and reducing health inequalities across England. Many of these related to diet and nutrition, including: the development of a *five a day* programme, including a National School Fruit Scheme (see later); local action to tackle obesity and inactivity; and a hospital nutrition policy. An equivalent document, *Our National Health: A Plan for Action, a Plan for Change*, was also published by the Scottish Executive (2000) to provide a clear statement of national priorities for health and for NHS Scotland. The Welsh version, *Improving Health in Wales: A Plan for the NHS and Its Partners* (National Assembly for Wales 2001a), is a plan for the development of the NHS in Wales.

**Treatment and prevention policies for specific diseases**

*The NHS Cancer Plan – A Plan for Investment, A Plan for Reform* (DH 2000c) provided a detailed account of the government’s national programme for investment in, and reform of, cancer services in England, and outlined ways in which to improve prevention. The Cancer Plan recognised that, after smoking, what people eat is the next biggest contributor to cancer deaths and may be responsible for up to a third of all cancer deaths. It also outlined the government’s plans to improve diet, focusing on fruit and vegetables, as outlined in the NHS Plan. The CHD and Diabetes National Service Frameworks are long-term strategies for improving specific areas of care. They both set at least one standard of relevance to nutrition, relating to advice and interventions on diet and weight management (DH 2000d, 2001). CHD and Diabetes National Service Frameworks for Wales were also published by the Welsh Assembly Government (2001a, 2002), and featured the need for appropriate advice and information about healthy eating and food provision.

**Improving nutrition in Wales**

*Food and Fitness – Promoting Healthy Eating and Physical Activity for Children and Young people in Wales* (Welsh Assembly Government 2006) outlines action in schools and the community to improve the nutrition and physical activity habits of children and young people in Wales. Actions, such as improving the nutritional quality of food and drink provided in schools via the *Appetite for Life* policy, are underpinned by training and evaluation (Wales Centre for Health 2006). This implementation plan builds on the *Nutrition Strategy for Wales* (FSA Wales 2003), a commitment to which was made in *Promoting Health and Well Being: Implementing the National Health Promotion Strategy* (Welsh Assembly Government 2001b). The *Nutrition Strategy* outlines the actions required by key players (including policy, health professionals, food production and retailers) to improve the diet of people in Wales. While the aim of the strategy is to improve the
of all people in Wales, it outlined certain groups (including children and young people) that need to be prioritised because of their poor diet and health. Recommendations of the strategy include a combination of information and training, local and national initiatives, and policies (FSA Wales 2003).

Improving health and nutrition in Scotland

A wider framework for action to improve the health of the people of Scotland is laid out in Improving Health in Scotland – the Challenge (Scottish Executive 2003). The document sets out the work programme of the various stakeholders, namely the Scottish Executive, the Special Health Board and NHS Boards. In terms of food and nutrition, targets and activities have been identified via the Scottish Diet Action Plan (SDAP), which began life in 1996. The plan, Eating for Health: A Diet Action Plan for Scotland, was published by the then Scottish Office (1999) after a 2-year inquiry. The SDAP sets out the various steps the key players can take on a voluntary basis to improve the Scottish diet. It was shaped by a series of targets for dietary improvement in Scotland to be delivered over the decade to 2005. In the next phase of the SDAP implementation, action will focus on the key targets of increasing consumption of fruit and vegetables and upon reducing consumption of fat, particularly saturates (Scottish Executive 2003).

Improving health and nutrition in England

The most recent policy document citing targets associated with diet and health for England was the recent Public Health White Paper (DH 2004b) entitled Choosing Health: Making Healthy Choices Easier, this outlines actions to tackle the main public health issues of the 21st century. The strategy document identified six priorities for action, which included improving diet and nutrition and reducing the prevalence of obesity. Notably, for the first time since the Health of the Nation Report (DH 1992), the government set a target with reference to obesity prevalence: to halt the year-on-year rise in obesity among children aged under 11 years by 2010. A number of other commitments to improve food, nutrition and health are made in the document, including:

- increasing the range of healthier foods;
- improving access to healthy foods;
- increasing support from the NHS.

Government-led labelling schemes

The first food labelling Order was made in 1944, but it was rapidly amended and became the 1946 Order (The Labelling of Food Order 1946 S.R. & O. 1946:2169), which signalled the start of detailed legal constraints on food labelling in the UK, and defined various terms (e.g. retail sale, pre-packed, label). There have been a number of significant steps in devising food labelling regulations, governed by the UK government. The year 2007 has seen some significant milestones in food labelling across the European Union (EU); in particular, the regulations controlling the use of health claims on food, and the addition of vitamins to products, were both published in the EU’s official journal in January 2007 (EU 2007a, 2007b). This is a significant event; as health claims have been used on food packaging and advertisements for decades, such as the Guinness advertisements, new regulations will no longer allow for this to happen without a claim having been approved of having a strong and credible scientific basis (Fig. 14). For an overview of the history of food labelling, see Turner (2007).

In the past 20 years, front-of-pack icons to highlight product information or positive attributes of a product related to its nutritional composition have become popular. In particular, the government has tried to encourage industry to highlight certain attributes of foods in this manner, and developed icons for industry to use, such as the folic acid symbol. The labelling scheme for foods fortified with folic acid was a key feature of a campaign launched in May 1997. The campaign aimed to increase awareness of the need for folic

Figure 14 Guinness advertisement (1949). Reproduced with kind permission of Diageo.
acid supplementation among women of childbearing age. Throughout the campaign, awareness increased from 9% in 1995 to 49% in 1998 (HEA 1998; for a review, see Buttriss 2004; Fig. 15).

The 5 A DAY logo, launched by the DH in 2002, was designed to increase awareness of the 5 A DAY message, and acted as a prompt to encourage people to eat more fruit and vegetables (see Cullum 2003; Fig. 15). However, most major UK retailers and a few food manufacturers have developed their own 5 A DAY logo to appear on their own-label products and pre-packaged fruits and vegetables. As outlined, with the activities to encourage people to eat more fruit and vegetables, awareness of the 5 A DAY message has increased (FSA 2007b). However, as expected, an increase in average consumption of fruit and vegetables has been steady (DEFRA 2007b). Another front-of-pack icon recently developed by the government is the multiple traffic light symbol that uses colour to illustrate the quantity of fat, saturates, sugars and salt per 100 g of the product (see Denny 2006; Fig. 15). Alternatively, some retailers and manufacturers have opted to display the amount of calories, sugars, fat, saturates and salt together with the percentage of the GDA (see Section 2.2) that is provided in one arbitrary portion of the food product.

Section 3: Trends in dietary patterns and nutrient intake

3.1: Measuring dietary patterns and nutrient intake

Data on dietary patterns and nutrient status in the population is used by government to inform nutrition policy and to contribute to the evidence base for government advice on healthy eating. There is no single measure that can be used as the basis of an assessment of nutritional status and a number of different approaches can be taken. Food intake can be measured at the population, group or individual level and different methods are suited to different needs. When comparing one country with another, food disappearance data are often used. For example, food balance sheets are constructed by the Food and Agriculture Organization from national accounts of the supply and use of foods. To better estimate food intake at a group or individual level, aggregate data are generated that are based on surveys of groups of people. Some surveys rely on household purchases as a proxy for food consumption, for example, the NFS, but this may not take into account food eaten outside the home, food waste or within-household variation. Other surveys combine data of estimated dietary intake at the individual level, such as the NDNS. Such approaches include completion of dietary records, questionnaire methods and interviews with individuals. Although by no means comprehensive, below is a list of the major surveys and long-term cohort studies that have informed our understanding of dietary patterns and nutrient status over the past 60 years.

Government-led surveys

National Food Survey (1940–2000)

The NFS is the longest-running continuous survey of household food consumption and expenditure in the world. It was originally set up in 1940 by the then Ministry of Food to monitor the adequacy of the diet of urban ‘working class’ households in wartime, but it was extended in 1950 to become representative of households throughout Great Britain. It provides a wealth of information that has made a major contribution to the study of the changing patterns of household food consumption. Increasing affluence, coupled with new technologies and changing patterns of behaviour, resulted in people eating more varied diets in and outside of the home. To capture this, the NFS was extended to cover the consumption of alcoholic beverages in 1991 and

Figure 15 Front-of-packing labels. 5 A DAY logo reproduced with kind permission of DH. Traffic light label reproduced with kind permission of FSA.
eating out in 1994. In 1996, the survey was further extended to cover results from Northern Ireland (i.e. the data were then presented for the UK).

Each year, about 6000 households took part in the survey. The household member who did most of the food shopping was asked questions about the household and its food purchasing. The respondents were then asked to keep a diary for 7 days to record food coming into the household, including quantities and expenditure, and some detail of the household meals (including snacks and picnics prepared from household supplies). The last wave of the NFS was conducted in 2000. The NFS has now been replaced by the Expenditure and Food Survey (EFS).

Running alongside the NFS was the Family Expenditure Survey (FES) (1957–2001). This survey was a continuous survey of household expenditure and income. The primary use of the FES was to provide information about spending patterns for the retail price index (RPI), although, over time, the uses extended. The FES fed into estimates of consumers’ expenditure in the National Accounts, was used for tax benefit modelling and was an important source of economic and social data for government and other research agencies. From April 2001 the data have continued to be collected in the EFS.

http://www.statistics.gov.uk/ssd/surveys/expenditure_food_survey.asp

The National Diet and Nutrition Survey (1992–present)

The NDNS gathers information about the dietary habits and nutritional status of the British population. It was set up jointly by MAFF and DH in 1992 after the success of the Dietary and Nutritional Survey of British Adults in 1986 (see below). Responsibility for the NDNS programme was transferred to the FSA when MAFF was disbanded in 1999. To date, four surveys have been conducted (see Table 5). Information has been collected from interviews, weighed dietary records (7-day 1997, 2000–2001; 4-day 1992–1993, 1994–1995), physical measurements and analysis of blood and urine samples. Data are also collected on physical activity and dental health.

To improve the timeliness and flexibility of the programme, a rolling format was introduced in 2007. A sample of 1000 people per year (aged from 1.5 years) are now assessed, allowing the analysis of the data from a group of 1500 adults and children after 2 years. This enables more frequent reporting from the survey and provides researchers with the opportunity to better analyse trends in dietary intake.


Dietary and Nutritional Survey of British adults (1986–1987)

This survey produced data on the food and nutrient intake, nutritional status, anthropometric and blood pressure measurements of the British population aged between 16 and 64 years in 1986–1987. A total of 2197

Table 5 National Diet and Nutrition Surveys

<table>
<thead>
<tr>
<th>Data collection period</th>
<th>Study population</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 1994–September 1995</td>
<td>2172 adults aged 65 years and over</td>
<td>Finch et al. (1998)</td>
</tr>
</tbody>
</table>
people completed a 7-day dietary record and provided a 24-hour urine collection and a blood sample (Gregory et al. 1990).

http://www.data-archive.ac.uk/findingData/snDescription.asp?sn=2836

Low Income Diet and Nutrition Survey (2007)
The aim of this survey was to provide robust baseline data on the diets and nutritional status of low-income/materially deprived consumers to assist the FSA, other government departments and other bodies in developing and monitoring policies to help reduce inequalities and social deprivation.

http://www2.warwick.ac.uk/fac/soc/sociology/research/current/lidns/

General Household Survey (1971–present)
The General Household Survey (GHS) is an annual survey of the general population that has been running since 1971. The GHS has included questions on population and fertility, family and household information, housing, health employment and education. Data from this survey contribute to the Social Trends reports.

http://www.statistics.gov.uk/ssd/surveys/general_household_survey.asp

The Health Survey for England (1990–present)
The Health Survey for England is a series of annual surveys about the health of people in England. The Health Survey was first proposed in 1990, by the then newly created Central Health Monitoring Unit within DH, to improve information on morbidity. This information is used to underpin and improve targeting of nationwide health policies. All surveys have covered the adult population aged 16 years and over who are living in private households in England. Children have been included each year since 1995.

http://www.ic.nhs.uk/pubs/hlthsuyeng2004upd

The Scottish Health Survey (1995–present)
Modelled closely on the Health Survey for England, the Scottish Health Survey monitors the general health of people living in Scotland and tracks progress towards health and dietary targets.

For each survey, fieldworkers interview around 10 000 adults and 4000 children. The survey series is commissioned by the Scottish Executive Department of Health.

http://www.scotland.gov.uk/Topics/Statistics/Browse/Health/scottish-health-survey

The Welsh Health Survey (2003–present)
The Welsh Health Survey was commissioned in its current form by the Welsh Assembly Government in 2003. Each year it collects data on the health of the population in Wales, use of health services, and health-related attitudes and behaviour, from over 15 000 adults and 3750 children.


Census information
A census is a survey of all people and households in the country. It provides essential information from national to neighbourhood level for government, business and the community. The first ‘modern’ census was conducted in 1801 and has been carried out every decade (except during the Second World War). The most recent census was on 29 April 2001 and the next is planned for 2011.

Long-term cohorts
Most food intake data are cross-sectional, that is, different people are surveyed each time. But some long-term cohorts exist and are particularly valuable, as selected group of people can be revisited on several occasions. Often set up to investigate specific diet–disease interactions, these large-scale studies generate data that can be used to monitor societal trends and dietary patterns over time.

Boyd Orr Cohort Study
The Boyd Orr cohort is an historical cohort study to investigate the long-term impact of children’s diet, growth, living conditions and health on adult CVD risk. It is based on the 65-year follow-up of 4999 children who were surveyed in the Carnegie United Kingdom Trust’s study of Family Diet and Health in Pre-War Britain (1937–1939) with the original aim of investigating the connection between economic factors and physical welfare. The follow-up began in 1988 and, to date, many findings have been published (see Martin et al. 2005). In particular, it has reported that high levels of energy intake in children are associated with increased risk of cancer in later life (Frankel et al. 1998) and that children whose family diets were rich in fruits had a reduced cancer risk (Maynard et al. 2003).

http://www.epi.bris.ac.uk/boydorr/
MRC National Survey of Health and Development (1946 Birth cohort)

The National Survey of Health and Development (NSHD) is a social class stratified, random sample of 5362 births in England, Scotland or Wales during the first week of March 1946. Dietary data were collected during home visits at ages 36, 43 and 53 years. Over this time, researchers have been able to study changes in nutrition, by contrasting diet in the cohort at age 4 (i.e. in 1950) with diet data from children of the same age in 1992–1993 collected in another study. This showed a higher mean daily intake of fat, carbohydrates, starch, iron, retinol and vitamin A in the 1950 sample, accounted for by their higher intakes of bread, vegetables and red meat. By contrast, sugar intake was higher in the 1992–1993 sample, principally because of their higher intakes of soft drinks and as intake was limited in 1950 by rationing (see Section 4). Vitamin C intakes were similar in the two sample populations, but this nutrient was derived mainly from vegetable intake in the 1950 children and from consumption of soft drinks by the 1992–1993 children (Prynne et al. 1999).

http://www.nshd.mrc.ac.uk/

Whitehall Study

The Whitehall Study investigated the social determinants of health, focusing on cardiorespiratory disease prevalence and mortality rates among British male civil servants between the ages of 20 and 64 years. The initial study, now referred to as the Whitehall I Study, began in 1967 when 18,403 middle-aged men were assessed. A second phase, the Whitehall II Study (1985), examined the health of 10,308 male and female civil servants aged 35–55 years. A long-term follow-up of study subjects from the first two phases is ongoing.

The Whitehall studies have reported strong associations between grade levels of civil servant employment and mortality rates from a range of causes. Men in the lowest grade (messengers, doorkeepers, etc.) had a mortality rate from CHD three times higher than that of men in the highest grade (administrators) (Marmot 1989).

http://www.ucl.ac.uk/whitehallII/

1958 National Child Development Study

Data from the National Child Development Study has been used to examine changes in diet and physical activity among British adults during the 1990s (from age 33 years in 1991 to age 42 years in 2000). During the 1990s, there were a number of focused health promotion campaigns advocating improved diets. The longitudinal nature of the National Child Development Survey allows examination of how individuals’ habits have changed over the decade, possibly as a response to these health education messages. Analysis of data from the study showed a reduction in consumption frequency of chips, little change in fried food consumption and some improvement in consumption of fruit, salad, raw vegetables and wholemeal bread. However, there was no overall improvement in physical activity (Parsons et al. 2005).

http://www.esds.ac.uk/longitudinal/access/ncds/l33004.asp

3.2: Dietary patterns

Wartime rationing

During the Second World War, the British government introduced food rationing to make sure that everyone received their fair share of the limited food that was available (see Section 4). Food rationing started in 1940 and finally ended in 1954. Initially, only a few foods were rationed, but more foods were included as the years passed.

The wartime food shortages forced people to adopt new eating patterns. Most people ate less meat, fat, eggs and sugar than they had eaten before, but people who had previously consumed a poor diet were able to increase their intake of protein and vitamins because they received the same ration as everybody else. Thus, many people consumed a better diet during wartime food rationing than before the war years and this had a marked effect on health outcomes; infant mortality rates declined, and the average age at which people died from natural causes increased (see Section 1.1).

UK eating habits 1940–today

The NFS indicates that significant changes in the patterns of purchases of foods for consumption in the home have occurred since the cessation of rationing in the 1950s when the immediate effects of the post-war food shortages were no longer felt. There has been a huge increase in the variety of foods that make up the British diet (see Section 4.2). In the 1970s, supermarkets were small and offered about 5000 different lines. Today that figure stands at over 40,000. However, what is notable is that, for some food groups, household purchases have remained remarkably stable. Despite the social and eco-
nomic turbulence that affected food availability over the past 60 years, as discussed in Section 4, the overwhelming impression has been one of stability (Fig. 16; Table 6).

However, looking at the data at a category level hides many of the changes that have been driving the move towards a healthier shopping basket. For example, although there has been a slight decline in milk purchased for consumption in the home over the past 60 years, there has been a dramatic shift in the type of milk bought. Since their introduction in 1983, there has been a year-on-year increase in the popularity of skimmed milks (both semi-skimmed and fully skimmed), with a concomitant decrease in purchases of whole milk. Figure 17 presents data from the NFS dating back to 1974, adjusted so it can be compared with the most recent data from the EFS. The increasing popularity of the skimmed milks is evident, as well as the decrease in total milk purchased. Skimmed milks overtook whole milk in 1993 and have continued to increase in popularity and dominate the category.

Similar effects can be seen for the meat and meat products category (Fig. 18). Overall, the amount of meat and meat products purchased for the household has remained relatively stable, increasing slightly from 746 g per person per week in 1942, to 966 g per person per week in 2000. However, there is much more year-to-year fluctuation in the amount and type of meat bought. Some of this variation can be attributed to specific events, such as the media frenzy around BSE in 1995–1996, or the high prices brought about by the unsettled economic conditions in the 1970s. However, the overwhelming trend since the NFS began has been the ascendancy of poultry to its position in 2000 as the most popular meat in the UK. Once considered a luxury eaten only at Christmas, poultry consumption has risen from an average individual intake of 10 g per week in 1950 to 253 g per person per week in 2000 (Table 7).

There have been some areas of the diet where changes have not necessarily been so desirable. Despite efforts to increase the consumption of starchy foods, fruits and vegetables, most of these types of foods have been on a decline (Fig. 19). There has been a marked decline in bread purchased for consumption in the home, falling from 1289 g per person per week in 1960 to only 720 g

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**Figure 16** Trends in the household purchases of the major food groups 1940–2000 (Source: DEFRA 2007a).

**Table 6** Household purchases of major food groups (g/week)

<table>
<thead>
<tr>
<th></th>
<th>1940s</th>
<th>1950s</th>
<th>1960s</th>
<th>1970s</th>
<th>1980s</th>
<th>1990s</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total milk and cream</td>
<td>2137</td>
<td>2892</td>
<td>2989</td>
<td>2870</td>
<td>2502</td>
<td>2220</td>
<td>2081</td>
</tr>
<tr>
<td>Total cheese</td>
<td>101</td>
<td>62</td>
<td>88</td>
<td>100</td>
<td>108</td>
<td>114</td>
<td>110</td>
</tr>
<tr>
<td>Total fruit</td>
<td>197</td>
<td>559</td>
<td>692</td>
<td>684</td>
<td>763</td>
<td>930</td>
<td>1120</td>
</tr>
<tr>
<td>Total potatoes</td>
<td>1877</td>
<td>1816</td>
<td>1484</td>
<td>1324</td>
<td>1160</td>
<td>901</td>
<td>707</td>
</tr>
<tr>
<td>Total vegetables</td>
<td>2901</td>
<td>2794</td>
<td>2424</td>
<td>2472</td>
<td>2408</td>
<td>2194</td>
<td>1986</td>
</tr>
<tr>
<td>Total cereals</td>
<td>593</td>
<td>693</td>
<td>714</td>
<td>688</td>
<td>676</td>
<td>708</td>
<td>788</td>
</tr>
<tr>
<td>Total meat and meat products</td>
<td>746</td>
<td>821</td>
<td>1069</td>
<td>1073</td>
<td>1097</td>
<td>950</td>
<td>966</td>
</tr>
</tbody>
</table>

Source: DEFRA 2007a.
per person per week in 2000. Thus, despite an increase in
the range of different breads available (we are now
buying many other types of bread, such as French, naan
and pitta bread, ciabatta and bagels), the amount of
bread in the average British diet is much less than in the
past.

The same is true for vegetable purchases. The
amount and type of different vegetables available to
the British public has boomed; however, purchases
have fallen from 2560 g per person per week in 1960
to 1986 g per person per week in 2000 (NB: the more
recent 5 A DAY campaign seems to be slowly, yet
steadily, increasing fruit and vegetable consumption –
see Section 4.1 for further information). There has
been a similar decrease in potato purchases from
1877 g per person per week in 1940 to only 707 g per
person per week in 2000. Yet the amount of fruit pur-
chased for consumption in the home has been steadily
increasing over this time and, in 1996, bananas over-
took apples as the most popular fruit in British homes.

<table>
<thead>
<tr>
<th>Year</th>
<th>Average poultry purchases (g/person/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>10</td>
</tr>
<tr>
<td>1960</td>
<td>50</td>
</tr>
<tr>
<td>1970</td>
<td>143</td>
</tr>
<tr>
<td>1980</td>
<td>189</td>
</tr>
<tr>
<td>1990</td>
<td>226</td>
</tr>
<tr>
<td>2000</td>
<td>253</td>
</tr>
</tbody>
</table>

Source: DEFRA 2007a.
popularity throughout this period. For example, mango sales rose by 150% in 1984 compared with 1978, and exports of kiwifruit from New Zealand to the UK rose from 16 628 trays to 317 144 trays between 1984 and 1985 (Young 1986).

There has also been a shift in the nature of the cooking fats and oils bought (Fig. 20). Butter purchases declined throughout the 1950s and 1960s and, in 1980, margarine became the most popular fat in the diet. However, this is now not the case. The proliferation of different types of fats and oils available over the last 20 years, as well as public health messages to reduce total fat intake (see Section 2.2), has resulted in reduced-fat spreads being the preferred option.

The amount of table sugar purchased by households has also decreased (Fig. 21). This may be because home baking has declined, as has pickle, sauce and jam-making. However, this is not to say that our diets contain less sugars. In fact, over the last 60 years, purchases of fruit juices, soft drinks and sugar coated cereals, for example, have increased (Fig. 21).

**Diet and low income**

Dietary surveys have demonstrated the persistence of marked differences in dietary patterns across different income levels in the population. Data from the NFS and NDNS show that low-income households consume less fruit, vegetables, salad, wholemeal bread, wholegrain cereals and oily fish, and more white bread, whole milk, table sugar and processed meat products (e.g. kebabs, meat pies and pasties) (DH 2003). For example, Figure 22 illustrates that fruit and vegetable intake of those in income group A is higher than income group D and that since 1978 the ‘gap’ has widened. As hinted at in Section 1, prevalence rates of diseases related to poor diets often display a marked socio-economic gradient. The link between poverty, diet and ill-health was recognised some time ago. For example, Boyd Orr, in *Food, Health and Income*, showed that at least one-third of the British people were so poor they could not afford enough food to maintain health (Boyd Orr 1936).
3.3: Nutrient intake

Data on household purchases are converted to estimates of nutrient intake using tables of food composition based on the *Composition of Foods* (FSA 2002b). The resulting datasets provide good indications of trends over time. Conversion factors were revised each year to account for any changes in food production, handling or fortification, and further allowances were made for expected cooking losses, seasonal variation and wastage of inedible materials. There are some factors that have to be taken into account when these data are interpreted. First, they did not take into account contributions made by meals consumed outside the home. No allowances were made for wastage of edible food, for example that thrown away or fed to pets. The data were also presented for an average person, which in many cases can be misleading. For example, households with many small children would report lower total nutrient intakes than households comprising adults, although this would not necessarily indicate that the former are malnourished. However, the data from the NFS provide our best method for analysing dietary patterns over such a long period and are adequate for the purposes of this report.

Table 8 highlights how total energy intakes, estimated from household purchases, peaked in the 1950s at 2660 kcal per person per day. This has now fallen, in line with declining levels of physical activity (see Section 4.3), to 1750 kcal per person per day. The percentage of energy coming from carbohydrate slumped during the 1970s and 1980s, but has been gradually increasing to

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* Figure 21 Sources of sugar in the UK diet 1940–2000 (Source: DEFRA 2007a) (Note: Sugar rationing ended in September 1953).

* Figure 22 Changes in fruit and vegetable consumption among income groups A and D, over three decades (Source: DEFRA 2007a).
50% in 2000 (Table 8). This is still lower than in 1940. This has been attributed to the contribution that cereals and cereal products have made towards the energy content of the diet.

Throughout the 1950s, 1960s and 1970s, animal products were consumed at the expense of cereal products, resulting in a gradual replacement of carbohydrates by fats. As described in the 1950 report, total energy needs were being satisfied by an increase in bacon, meat, eggs, cheese, milk and cooking fats, and a decrease in cereals, breads, potatoes, sugars and preserves. However, since the 1980s, this trend has been reversed and cereals and cereal products have made an increasing contribution to the total energy intake, along with a decline in the fat content of many commonly consumed animal products (Fig. 23; see Section 4.2). Energy derived from protein has remained remarkably constant at approximately 11%, which is surprising considering the year-to-

Table 8 Macronutrient content of the UK diet estimated from household purchases, 1940–2000

<table>
<thead>
<tr>
<th>Year</th>
<th>Energy (kcal)</th>
<th>Fat</th>
<th>Protein</th>
<th>Carbohydrate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount (g)</td>
<td>% energy</td>
<td>Amount (g)</td>
<td>% energy</td>
</tr>
<tr>
<td>1940</td>
<td>2355</td>
<td>NA</td>
<td>NA</td>
<td>77</td>
</tr>
<tr>
<td>1945</td>
<td>2375</td>
<td>92</td>
<td>34.9</td>
<td>76</td>
</tr>
<tr>
<td>1950</td>
<td>2474</td>
<td>101</td>
<td>36.7</td>
<td>78</td>
</tr>
<tr>
<td>1955</td>
<td>2641</td>
<td>107</td>
<td>36.5</td>
<td>77</td>
</tr>
<tr>
<td>1960</td>
<td>2630</td>
<td>115</td>
<td>39.4</td>
<td>75</td>
</tr>
<tr>
<td>1965</td>
<td>2590</td>
<td>116</td>
<td>40.3</td>
<td>75</td>
</tr>
<tr>
<td>1970</td>
<td>2560</td>
<td>119</td>
<td>41.8</td>
<td>74</td>
</tr>
<tr>
<td>1975</td>
<td>2290</td>
<td>107</td>
<td>42.1</td>
<td>72</td>
</tr>
<tr>
<td>1980</td>
<td>2230</td>
<td>106</td>
<td>42.8</td>
<td>73</td>
</tr>
<tr>
<td>1985</td>
<td>2020</td>
<td>96</td>
<td>42.8</td>
<td>67</td>
</tr>
<tr>
<td>1990</td>
<td>1870</td>
<td>86</td>
<td>41.4</td>
<td>63</td>
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<td>1995</td>
<td>1780</td>
<td>78</td>
<td>39.4</td>
<td>63</td>
</tr>
<tr>
<td>2000</td>
<td>1750</td>
<td>74</td>
<td>38.1</td>
<td>66</td>
</tr>
</tbody>
</table>

Source: DEFRA 2007a. NA, not available.

Figure 23 Contributors to energy intake from household food purchases (Source: DEFRA 2007a) (Data for 1990 were unavailable).
year fluctuations that have been observed in the intake of the main protein sources in the diet.

The proportion of energy in the diet coming from fat is about the same as was observed in the 1950s. In the 1960s and 1970s, the energy from fat in the British diet increased, reaching a peak of 42% of food energy (120 g per day) in 1969. However, there has been a downward trend in the total amount of fat in the diet since the late 1980s and it was reported to be 74 g per person per day in the 2000 report. This, along with declining energy intakes, has resulted in the percentage of energy derived from fat falling slightly (38% in 2000). Contributors to fat intake have remained relatively stable over the decades with a slightly greater contribution derived from cereals in recent years (Fig. 24).

The fatty acid profile of the diet has also changed considerably over this period (Table 9). The population is now consuming less saturates, deriving proportionally more of their energy from unsaturates. This will be attributable to the general switch from whole milk, butter, margarine and lard to semi-skimmed and skimmed milks, vegetable oils and low/reduced-fat spreads, along with improvements in the fatty acid profile of meat (Figs 25,26).

### Micronutrients

There have been considerable changes in the types of foods purchased for consumption in the home. This means that the main sources of nutrients in the diet have

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**Table 9** The fatty acid profile of the UK diet estimated from household purchases 1975–2000

<table>
<thead>
<tr>
<th></th>
<th>Saturates</th>
<th>Monounsaturates</th>
<th>Polyunsaturates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount (g)</td>
<td>% energy</td>
<td>Amount (g)</td>
</tr>
<tr>
<td>1975</td>
<td>51.7</td>
<td>20.3</td>
<td>39.8</td>
</tr>
<tr>
<td>1980</td>
<td>46.8</td>
<td>18.9</td>
<td>39.6</td>
</tr>
<tr>
<td>1985</td>
<td>40.6</td>
<td>18.1</td>
<td>34.7</td>
</tr>
<tr>
<td>1990</td>
<td>34.6</td>
<td>16.7</td>
<td>31.8</td>
</tr>
<tr>
<td>1995</td>
<td>30.8</td>
<td>15.6</td>
<td>28.7</td>
</tr>
<tr>
<td>2000</td>
<td>29.2</td>
<td>15.0</td>
<td>26.3</td>
</tr>
</tbody>
</table>

Source: DEFRA 2007a.
also changed with knock-on effects on nutrient intakes. However, the extent to which these differences reflect changes in the diet is not clear. Many factors contribute to such differences, including changes in nutrient composition, analytical methods, fortification practices and use of dietary supplements. Currently, nutrient intake in the UK population is below the lower reference nutrient intake (LRNI) for a number of essential vitamins and minerals, especially in older children, young adults and older people living in institutions. The LRNI will only
meet the needs for roughly 2.5% of the population; thus, it is assumed that if greater than 5% of people are habitually consuming less than this amount, they will not be meeting their requirements (see Fig. 11). (For a clearer analysis of micronutrient intake in the different subgroups in the population, see the NDNS.)

Overall, looking at the intake patterns of vitamins and minerals that have been analysed over the entire duration of the NFS, there is no consistent trend (Table 10). Average intakes for some micronutrients have increased, whereas others have decreased, for example calcium, iron and vitamin C. Vitamin A intake has declined since the 1970s, in part because of the continuing decline in the consumption of liver. There have also been changes in the way that the amount of vitamin A in the household has been estimated, as little data has been available on the levels of the individual carotenoids in food.

### Calcium

The major sources of calcium in the British diet are dairy products and bread. Since 1946, there has been mandatory fortification of flour for use in white or brown bread with calcium. The effect that this initially had on calcium intakes in the population is clearly visible in Figure 27. Since then, calcium intakes have been affected by both a decline in bread consumption and by that of milk and dairy products (see Fig. 16), and the average intake in 2000 was 860 mg/day. However, milk, cream and cheese still contribute the majority of calcium in the UK diet (46%) compared with cereal and cereal products (28%; Fig. 28). In 1950, dairy products and bread and other cereal products contributed 60% and 28% of calcium intake, respectively.

### Iron

Concerns have been raised that, as consumption of red meat has fallen over time, this may have had detrimental effects on the amount of iron in the diet. Data from the NFS show a downward trend from the 1960s (see Fig. 27). Average iron intake, estimated from household purchases, reached a peak of 14.1 mg per person per day in 1960 and has now fallen to 10.1 mg per person per day.

However, many foods contribute to total iron intake and changes to the composition and purchasing patterns of these foods have had an effect on the iron status of the population. Cereals have made an increasing contribution to the total iron intake. Mandatory fortification

---

**Table 10 Micronutrient content of the UK diet estimated from household purchases 1940–2000**

<table>
<thead>
<tr>
<th>Year</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
<th>Thiamin (mg)</th>
<th>Riboflavin (mg)</th>
<th>Vitamin C (mg)</th>
<th>Vitamin A* (μg)</th>
<th>Vitamin D (μg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td>614</td>
<td>12.8</td>
<td>1.18</td>
<td>1.49</td>
<td>51</td>
<td>NA</td>
<td>2.93</td>
</tr>
<tr>
<td>1945</td>
<td>875</td>
<td>12.7</td>
<td>1.47</td>
<td>1.58</td>
<td>43</td>
<td>2908</td>
<td>3.57</td>
</tr>
<tr>
<td>1950</td>
<td>1066</td>
<td>13.6</td>
<td>1.51</td>
<td>1.69</td>
<td>43</td>
<td>3536</td>
<td>4.30</td>
</tr>
<tr>
<td>1955</td>
<td>1044</td>
<td>13.5</td>
<td>1.24</td>
<td>1.65</td>
<td>51</td>
<td>4199</td>
<td>3.60</td>
</tr>
<tr>
<td>1960</td>
<td>1040</td>
<td>14.1</td>
<td>1.27</td>
<td>1.70</td>
<td>52</td>
<td>4360</td>
<td>3.25</td>
</tr>
<tr>
<td>1965</td>
<td>1020</td>
<td>13.9</td>
<td>1.27</td>
<td>1.70</td>
<td>52</td>
<td>4370</td>
<td>3.13</td>
</tr>
<tr>
<td>1970</td>
<td>1030</td>
<td>13.4</td>
<td>1.17</td>
<td>1.77</td>
<td>52</td>
<td>1350</td>
<td>2.82</td>
</tr>
<tr>
<td>1975</td>
<td>1010</td>
<td>11.6</td>
<td>1.15</td>
<td>1.77</td>
<td>51</td>
<td>1370</td>
<td>2.63</td>
</tr>
<tr>
<td>1980</td>
<td>960</td>
<td>11.3</td>
<td>1.16</td>
<td>1.92</td>
<td>58</td>
<td>1350</td>
<td>2.85</td>
</tr>
<tr>
<td>1985</td>
<td>850</td>
<td>10.8</td>
<td>1.33</td>
<td>1.76</td>
<td>52</td>
<td>1370</td>
<td>2.96</td>
</tr>
<tr>
<td>1990</td>
<td>820</td>
<td>10.4</td>
<td>1.28</td>
<td>1.61</td>
<td>52</td>
<td>1100</td>
<td>3.02</td>
</tr>
<tr>
<td>1995</td>
<td>810</td>
<td>9.5</td>
<td>1.34</td>
<td>1.57</td>
<td>52</td>
<td>1010</td>
<td>2.96</td>
</tr>
<tr>
<td>2000</td>
<td>860</td>
<td>10.1</td>
<td>1.43</td>
<td>1.75</td>
<td>59</td>
<td>780</td>
<td>3.29</td>
</tr>
</tbody>
</table>

Source: DEFRA 2007a. NA, not available.

*Owing to changes in the survey methodology, values for 1970 onwards are as μg of retinol equivalent.

---

**Figure 27 Calcium and iron in the UK diet estimated from household purchases 1940–2000 (Source: DEFRA 2007a).**
of flour for white and brown flours with iron (along with thiamine and nicotinic acid) was introduced in 1956 as a means of ensuring the nutrient quality of the grains in refined flours. However, despite a decrease in the amount of bread consumed, cereals continue to provide over 50% of the iron in the diet because of the voluntary fortification of breakfast cereals. Breakfast cereals account for approximately 20% of the total

**Figure 28** Contributors to calcium intake from household food purchases (Source: DEFRA 2007a) (Data for 1990 were unavailable).

**Figure 29** Contributors to iron intake from household food purchases. (Source: DEFRA 2007a) (Data for 1990 were unavailable).
intake of iron and therefore make an important contribution in the diets of children and young adults, population groups especially prone to low intakes (Fig. 29).

**Vitamin C**

Today the main dietary sources of vitamin C are fruits and vegetables. However, because much of the vitamin C is lost when fruits and vegetables are prepared and cooked, the data collected on the purchases of these foods are of little use unless these losses are taken into account. During the war period, potatoes, then a major source of vitamin C in the diet, were plentiful, but fruit was not. As a result, there is a clear decrease in the average individual vitamin C obtained from household foods before 1955 (Fig. 30). Once rationing was over, potato consumption decreased, although consumption of fruit and fruit juice increased, bringing average vitamin C intakes up from 51 mg/day in 1940 to 59 mg/day in 2000 (NFS). In 2000, the main contribution to vitamin C intake came from fruits and vegetables (76.2%). This compares to the 1950s, when potatoes contributed 34% and fruits and vegetables 54% of total vitamin C intake (Fig. 31).

**Eating out**

The data that have been presented up until this point have been for individual consumption in the household. However, trends in eating out have changed substantially over the past 60 years and, increasingly, foods consumed outside of the home have contributed a greater proportion of the total nutrient intake (see Section 4.3). Since its revamp in 2000, the EFS has collected data on the amount of food consumed outside of the home and has analysed the nutrients that these foods provide. Table 11 indicates that despite increasing numbers of meals eaten outside of the home, the trend for reduced nutrient intake is still evident (DEFRA 2007b). As the EFS uses a slightly different survey methodology than that used by the NFS, data have been presented for the household intake of these selected nutrients to enable easy comparison (DEFRA 2007b; Table 12).
Section 4: Factors influencing food access and availability

In order to put some of the dietary changes outlined in Section 3 in context, this section considers some of the major influences on food access and availability in the UK since the 1940s – namely government policies, advances and innovations of the food industry and consumer-led changes.

4.1: Government policies

A number of factors govern which foods are available, some of which we have little control over (e.g. climate). However, governments do have significant influence over food availability within their country, for example as a result of trade policies. Traditionally, food policies have had to ensure that the national diet contains adequate amounts of energy and essential nutrients, and this is still the case in many countries today. However, in the UK (and other developed countries), the plentiful abundance of food means that food and nutrition security is currently not an issue for a large proportion of the population, although some subgroups of the population may still lack this basic need to varying degrees. More recent government policies regarding food and nutrition have focused on improving the nutrient profile of foods, in order to promote a healthy balanced diet (see Section 2.3).

Rationing

As a nation, the last time that nutritional security was a concern was over 60 years ago during, and for some time after, the Second World War, as constraints were placed upon the food supply because of attacks on merchant

---

Table 11  UK eating out energy and nutrient intakes derived from household food and drink purchases 2000–2006 (average per person per day)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kcal)</td>
<td>310</td>
<td>309</td>
<td>303</td>
<td>288</td>
<td>280</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>10.4</td>
<td>10.4</td>
<td>10.3</td>
<td>10.0</td>
<td>9.8</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>13.2</td>
<td>13.2</td>
<td>13.0</td>
<td>12.4</td>
<td>12.1</td>
</tr>
<tr>
<td>of which saturates (g)</td>
<td>4.2</td>
<td>4.2</td>
<td>4.1</td>
<td>3.9</td>
<td>3.8</td>
</tr>
<tr>
<td>of which monounsaturates (g)</td>
<td>5.4</td>
<td>5.4</td>
<td>5.3</td>
<td>5.1</td>
<td>5.0</td>
</tr>
<tr>
<td>of which polyunsaturates (g)</td>
<td>2.7</td>
<td>2.7</td>
<td>2.7</td>
<td>2.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Carbohydrate (g)</td>
<td>32.0</td>
<td>32.0</td>
<td>31.0</td>
<td>30.0</td>
<td>29.0</td>
</tr>
<tr>
<td>Calcium (mg)</td>
<td>88.0</td>
<td>89.0</td>
<td>86.0</td>
<td>83.0</td>
<td>81.0</td>
</tr>
<tr>
<td>Iron (mg)</td>
<td>1.3</td>
<td>1.4</td>
<td>1.4</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Vitamin C (mg)</td>
<td>11.0</td>
<td>10.0</td>
<td>10.0</td>
<td>9.0</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Source: DEFRA 2007b.

Table 12  UK household energy and nutrient intakes derived from household food and drink purchases 2000–2006 (average per person per day)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kcal)</td>
<td>2098</td>
<td>2101</td>
<td>2079</td>
<td>2050</td>
<td>2082</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>71.7</td>
<td>71.8</td>
<td>71.1</td>
<td>70.7</td>
<td>72.0</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>86.1</td>
<td>85.5</td>
<td>84.9</td>
<td>83.5</td>
<td>84.8</td>
</tr>
<tr>
<td>of which saturates (g)</td>
<td>34.0</td>
<td>33.8</td>
<td>33.7</td>
<td>33.0</td>
<td>33.4</td>
</tr>
<tr>
<td>of which monounsaturates (g)</td>
<td>31.0</td>
<td>30.8</td>
<td>30.7</td>
<td>30.2</td>
<td>30.7</td>
</tr>
<tr>
<td>of which polyunsaturates (g)</td>
<td>15.2</td>
<td>15.0</td>
<td>14.8</td>
<td>14.6</td>
<td>14.9</td>
</tr>
<tr>
<td>Carbohydrate (g)</td>
<td>264.1</td>
<td>266.0</td>
<td>261.0</td>
<td>257.0</td>
<td>262.0</td>
</tr>
<tr>
<td>Calcium (mg)</td>
<td>937.0</td>
<td>936.0</td>
<td>930.0</td>
<td>906.0</td>
<td>921.0</td>
</tr>
<tr>
<td>Iron (mg)</td>
<td>11.1</td>
<td>11.1</td>
<td>11.2</td>
<td>11.2</td>
<td>11.5</td>
</tr>
<tr>
<td>Vitamin C (mg)</td>
<td>67.0</td>
<td>69.0</td>
<td>67.0</td>
<td>64.0</td>
<td>69.0</td>
</tr>
</tbody>
</table>

Source: DEFRA 2007b.
shipping delivering the food imports (which accounted for over half of food supplies in 1939) and the world food shortages (Ministry of Food 1946). In 1938, to ensure fair distribution of available food, the government set up a committee of nutrition experts to advise the War Cabinet on a strategic food policy. The outcome was a system of food rationing to ensure fair distribution of available food (Fisher 1977). To ensure good health, the amounts of available foods, to cover people’s nutrient needs, were calculated by scientists and statisticians (Fisher 1977). The system was introduced in January 1940 and, by the end of 1943, most foods were distributed by some form of rationing system.

An individual’s entitlement varied according to their occupation, religion and special dietary needs. For example, vegetarians were allowed to swap their weekly meat allowance for 8 oz (=350 g) of cheese and were able to obtain vegetable margarine and cooking fat in place of the usual kind (which contained whale oil). Manual and agricultural workers who did not have access to a works canteen were also allowed an extra cheese ration (12 oz/week or =400 g/week). Special arrangements were also made for young children, expectant and nursing mothers to receive cod liver oil, orange juice and milk, from welfare clinics. When oranges were available, children under 6 years of age (and all children under 18 years of age from 1942) were entitled to receive 1 lb (450 g) per area allocation. As mentioned in Section 3.2, the general health of children improved and, on average, they were taller and heavier than children before the war.

The rations of food varied throughout the war. Most foods were distributed by 1 of 3 rationing systems.

- Straight rationing – meat, cheese, bacon, fats, sugar, preserves, tea.
- Points rationing – canned meats, canned fish, canned peas and beans, canned fruit, dried fruit, rice, sago, tapioca, dried pulses, condensed milk, cereal breakfast foods, biscuits, oat flakes and rolled oats, syrup and treacle, chocolate and sugar confectionery. Each person was allocated a number of points and a selected range of foods was given a point value. The consumer could choose how to spend these points.
- Controlled distribution schemes – liquid milk and milk powder, shell eggs, dried eggs, oranges.

Foods not rationed included flour, oatmeal, potatoes (except for 1947, after a very severe winter), other fresh vegetables, fruit (other than oranges) and fish. In addition, bread was usually not rationed, except between July 1946 and July 1948. Many people grew their own vegetables in their gardens and allotments and kept hens to supplement their rations. Indeed, the government ran a series of successful campaigns to encourage the consumption of home-grown vegetables, including Dig for Victory! and Dr Carrot and Potato Pete (Fig. 32). The Ministry of Food also gave advice to the public about how to make the best of the food that was available. This included radio broadcasts, cookery demonstrations and recipe leaflets.

For more detailed information on the rationing system refer to Ministry of Food (1946) or ABC of rationing in the United Kingdom 1951 (Ministry of Food, 1951).

Common Agricultural Policy

Since rationing, the most significant policy to affect food supply over the past 60 years has been CAP. CAP was developed between six member states of the then European Economic Community (EEC). Europe had just recovered from the devastating effects of the Second World War, where many countries had witnessed extreme food shortages and had needed to rely on rationing to feed their population. Three of the five main objectives of CAP, accepted in 1957, were to ensure a secure supply of food at stable and competitive prices, to increase agricultural productivity and to protect farmers’ incomes. These objectives were to be achieved by a harmonisation of farm prices across the six countries, which would be set at a level above world prices, as the cost of production in Europe was higher than in other producing countries (Tansey 1996). The prices would be maintained by intervention if necessary, and variable import levies and export refunds would be in place to protect home-produced foods from cheaper imports.
imports while allowing the farmers to trade on the world market without losing out. During the time that it took the Community to develop CAP, technological advances in agriculture had increased farm output despite a gradual decline in the number of farm workers (Tracy 1989).

The UK joined the then EEC [which became known as the European Community (EC)] in 1973 and, as the number of countries involved in the Community increased, production continued to increase and CAP became responsible for surpluses, which began to cause embarrassment as they became referred to as ‘butter mountains’ and ‘milk lakes’. The surpluses were also an economic burden for the EC, owing to the cost of storage and subsidised exports. Schemes to reduce the amount of food produced were put in place, including milk quotas (1984) and voluntary set-aside in association with the Andreisson reform of 1987–1988. The farmer received compensatory payment for the loss of income resulting from the reduced amount of crop produced, as one of the objectives of CAP was to protect farmers’ incomes. However, policy was still in place that encouraged the maximum crop production from the land. Hence, there was a conflict of interests – on the one hand, farmers were being offered money to keep land out of production but, on the other hand, they were also being paid more money to produce more crops. Concurrently, other supply management reform strategies were being introduced. For example, farmers could also no longer expect the price guarantees to apply for an unlimited amount of crop and they would be charged for any production above a certain fixed volume; the idea of farmer–EC co-responsibility.

The high prices kept Europe protected from the competition of the world market, as imports were liable to expensive levies to ensure the farmer would receive a price comparable to that within Europe. Despite static farm prices since 1985, the EC was spending an increasing proportion of its budget on the management of the surpluses. This included the disposal of surplus food onto the world food market. The EC allowed huge quantities of food to be sold to the rest of the world at a greatly reduced price in an effort to alleviate the growing excess. Food of European origin was able to undercut locally produced food in many developing countries, adding to the problems that these countries were already suffering. The reforms of the 1980s were not preventing the accumulation of surplus crops and it was accepted that a more radical solution was needed.

Between 1986 and 1993 trade negotiations were opened between the EC and other countries under the General Agreement on Tariffs and Trade Uruguay Round, and reforms were called for. The MacSharry reform of 1992 aimed to bring prices of foods under CAP more in line with the world prices, and was achieved with substantial cuts in support prices that were compensated for by direct payments to farmers (Zervoudaki 2000). The set-aside scheme continued, and new quota schemes were introduced for the livestock and dairy sectors as well as arable crops and sugar beet. However, the concept of set-aside has not been popular with farmers or the public. Yet it was implemented to keep farmers and farmland in business because of the initial objective of CAP, that is, to maintain the livelihood of farmers.

As a result of further reforms since the beginning of this decade, subsidies on quantities produced have largely been replaced by payments to farmers to guarantee they receive a decent income. In order to address concerns about the impact of more intensive farming to human health, payments have been linked to compliance with broader objectives, including environmental and food safety, animal and plant health, and animal welfare standards, and expectations on keeping farmland in good condition in order to preserve traditional rural landscapes, and bird and wildlife. Moving from support for products to support for farmers is in the interests of fairer world trade, as it reduces the risk that trade will be distorted by EU subsidies for export of additional production. In international trade liberalisation talks, the EU has agreed to eliminate export subsidies altogether by 2013.

1970s–1980s

In reviewing the government-led factors influencing food availability, the policy decisions of the 1970s and 1980s are noteworthy. In the period 1974–1981, inflation was above 10% in most years and prices more than tripled in these 8 years. A number of political factors, including the world commodities prices boom, the adoption of CAP and the food subsidy programme, caused extreme volatility in the retail prices of many foodstuffs, along with the drought of 1975–1976. Government intervention to freeze the price on all foodstuffs except perishables from 1973, and the 3-day week in 1974 as a result of oil shortages, resulted in a shortage of staple foodstuffs and short-term price rises of particular foods, such as beef, potatoes and butter, which ultimately impacted on consumption levels (MAFF 1991). Interestingly, as can be seen from Figure 33, the decline in butter was complemented by an increase in margarine, which was cheaper.
Sustainable food and farming strategy

Environmental issues were not among government priorities 50 years ago. It was taken for granted at that time that good husbandry would ensure viable rural communities and safeguard the environment; however, as is now recognised, that is not automatically the case (DEFRA 2002). In response to the massive difficulties and pressures faced by British food and farming in the 1990s, the government called for an independent review of food and farming, including recommendations on how the government should take the agenda forward to ensure a sustainable development (DEFRA 2002). In response to this, the Policy Commission on the Future of Farming and Food was set up in August 2001, chaired by Sir Don Curry. The Commission’s report (Policy Commission on the Future of Farming and Food 2002) became known as the Curry Report and set out a vision for the farming and food industry, and was a major contribution to a new government strategy, entitled Strategy for Sustainable Farming and Food: Facing the Future in England, published in December 2002. It set out how industry, government and consumers could work together to secure a sustainable future for farming and food industries, as viable industries contributing to a better environment and healthy and prosperous communities. The report recognised that the food we eat affects our health, and noted that the government and food industry need to ensure that health goals are focused on the same objectives from the promotion of nutrition and food safety issues to the maximisation of animal health and welfare (Policy Commission on the Future of Farming and Food 2002).

Schemes to improve availability of food to subgroups of the population

Welfare Food Scheme/Healthy Start The Welfare Food Scheme was developed in 1940 as part of the war effort to ensure that expectant mothers and young children were properly nourished (DHSS 1988). Much of the improvement in the wellbeing of children during and after the Second World War was attributed to the scheme and, in 1946, the government decided to continue it as part of the peace-time social services, and a commitment was made through legislation. Data comparing the consumption of milk from 1937 to 1939 with that from 1955 to 1958, when the scheme was underway, illustrate how the scheme enabled children to consume at least one to two pints of milk, extra, per week, as seen in Figure 34. As Margaret Hollingsworth (1974), a former chair of BNF, reported, the scheme was hailed as the most important single contribution to the improvement of the diet of working class families during the past generation.

Originally, benefits that included vouchers for dried baby milk or fresh milk were universal, but from 1968 eligibility was restricted to those who received some form of benefit or were on a low income (DH 2002b). The type of foods that could be ‘purchased’ using the vouchers has only been slightly modified over the course...
of the scheme (see Table 13), that is, until 2006; after a number of years of deliberation [including a scientific review by COMA (DH 2002b)] and numerous public consultations, a significantly revised scheme, entitled Healthy Start, was rolled out across the country (see http://www.healthystart.nhs.uk).

Table 13 Modifications to the foods provided as part of the Welfare Food Scheme

<table>
<thead>
<tr>
<th>Year</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td>Liquid milk, national dried milk, concentrated orange juice and cod liver oil.</td>
</tr>
<tr>
<td>1975</td>
<td>Cod liver oil was removed from the list. Vitamin drops and tablets containing vitamins A and D became a substitute; vitamin C was also added as a third component, as orange juice was also omitted from the scheme.</td>
</tr>
<tr>
<td>1977</td>
<td>In the 1975 Order national dried milk was withdrawn and a list of suitable infant formulas, based on advice from COMA, was published.</td>
</tr>
<tr>
<td>1988</td>
<td>7 pints of liquid milk per week. Infants under 1 year may receive instead 900 g per week of an approved infant baby formula. Vitamin supplements containing vitamins A, C, D during pregnancy and breastfeeding. Children under 5 years were eligible to two bottles of drops containing vitamins A, D and C.</td>
</tr>
<tr>
<td>2006</td>
<td>Fresh fruit and vegetables, liquid milk and infant formula.</td>
</tr>
</tbody>
</table>

Sources: NHS (2007); DH (2002b); DHSS (1988).

Food in schools The provision of food in schools has always been an important medium through which to improve children’s nutrition, although originally it was introduced to improve children’s learning (see Passmore & Harris 2004). Since the first time school meals were introduced in England in 1906, there have been a number of milestones, as summarised in Table 14.

As outlined in the report by the School Meals Review Panel of England, severe financial pressures and the fragmentation of school catering have resulted from the lack of consistent standards for school meals and the move from public to private sector provision (SMRP 2005). To oversee the significant changes to food in schools across England, the School Food Trust was established by the DfES in September 2005. Its remit is to transform school food and food skills, promote the education and health of children and young people, and improve the quality of food in schools (for more information, see http://www.schoolfoodtrust.org.uk). A similar working group has been set up by the Welsh Assembly – the Food in Schools Working Group was set up in 2005 to drive forward improvements in food and nutrition in schools and ensure a consistent and coherent approach. In summer 2006, the group launched a consultation on the initiative Appetite for Life, aiming for more stringent nutritional standards for school lunch across Wales (Wales Centre for Health 2006). Meanwhile, Scotland has received recognition for their initiative, Hungry for Success. Improvements to school meals in primary schools were implemented in line with the report Hungry for Success: A Whole School Approach to School Meals (Scottish Executive 2002), and all schools have been set the target to meet these standards by 2006. Her Majesty’s Inspectorate of Education began monitoring the implementation of the rec-
recommendations of Hungry for Success: A Whole School Approach to School Meals in Scotland in September 2004, and annual reports have been published since (Scottish Executive 2005b). More recently, lobbying efforts focus around extending the provision of free school meals.

Table 14 Milestones in the history of school meals in England

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1934</td>
<td>Milk-in-schools scheme started.</td>
</tr>
<tr>
<td>1939</td>
<td>50% of elementary school children were receiving a third of a pint of milk, at low cost or free of charge. 5% of elementary school children (‘necessitous children or those clearly in need of nourishment’) benefited from a free school meal (Ministry of Food 1946)</td>
</tr>
<tr>
<td>1940</td>
<td>National policy to provide all children in school with a subsidised school meal. Government covered 70% of the cost (rising in 1941 to 95% and in 1947 to 100%).</td>
</tr>
<tr>
<td>1941</td>
<td>First nutritional standards for school meals were set. At this time the quantity of fat and protein were rationed and therefore the school meal was expected to meet most a child’s ration allocation (Board of Education 1941)</td>
</tr>
<tr>
<td>1944</td>
<td>Education Act made it the duty of local education authorities (LEAs) to provide a meal and one-third of a pint of free milk daily to every pupil under the age of 18 years.</td>
</tr>
<tr>
<td>1950</td>
<td>A set charge for the school meal was introduced, except for those who were unable to pay.</td>
</tr>
<tr>
<td>1966</td>
<td>Nutritional standards were updated.</td>
</tr>
<tr>
<td>1967</td>
<td>Financial responsibility for school meals was handed over to the LEAs, who were then allowed to charge the pricing system at their own discretion (SMRP 2005).</td>
</tr>
<tr>
<td>1968</td>
<td>Free milk was withdrawn from secondary school pupils.</td>
</tr>
<tr>
<td>1971</td>
<td>Free milk was withdrawn from all children over the age of 7 years.</td>
</tr>
<tr>
<td>1980</td>
<td>The Education Act (1980) removed:</td>
</tr>
<tr>
<td></td>
<td>– nutritional standards altogether, replacing them with food-based guidelines</td>
</tr>
<tr>
<td></td>
<td>– the obligation for LEAs to provide school meals or sell meals at a fixed price, although a free school meal still had to be provided to eligible children, but not necessarily as the standard two-course meal that has been typical</td>
</tr>
<tr>
<td></td>
<td>– the obligation to provide school milk for children under the age of 7 years (became discretionary) (SMRP 2005).</td>
</tr>
<tr>
<td>1987</td>
<td>Social Security Act 1986 comes into force and limited the right to free school meals to those children whose parents received supplementary benefit.</td>
</tr>
<tr>
<td>1988</td>
<td>Local Government Act (1988) introduced Compulsory Competitive Tendering, obliging all LEAs to put school meals services out to tender. The guiding principle was ‘lowest bid wins’, and this put economy above quality in provision of the service.</td>
</tr>
<tr>
<td>2004</td>
<td>Research in both primary and secondary schools in England reported that nutritional standards were not being implemented effectively (Nelson et al. 2004; Ofsted 2004).</td>
</tr>
<tr>
<td>2005</td>
<td>An accumulation of lobbying and media attention resulted in the formation of an expert panel (School Meals Review Panel) to review and provide recommendations on school meals across England. As a result, Turning the Tables: Transforming SchoolMeals was published, which set out the food and nutrient standards for school meals in England.</td>
</tr>
<tr>
<td>Sept 2006</td>
<td>Nutrient standards for food provision in schools across England has been staggered:</td>
</tr>
<tr>
<td></td>
<td>Sept 2006: School food provision was expected to meet interim food-based standards for school lunches.</td>
</tr>
<tr>
<td></td>
<td>Sept 2007: Became compulsory for school food provision, other than lunch (i.e. vending machines, tuck shops, etc.) to meet food-based standards.</td>
</tr>
<tr>
<td></td>
<td>Sept 2008: Primary school lunches will need to meet nutrient standards.</td>
</tr>
<tr>
<td></td>
<td>Sept 2009 Secondary school lunches will need to meet nutrient standards.</td>
</tr>
</tbody>
</table>

Sources: SMRP (2005); McMahon and Marsh (1999); Ministry of Food (1946).

Food and nutrition education in schools, and other initiatives

Sixty years ago, teaching ‘practical’ food skills was included in the education of girls, under the auspices of House Craft and Domestic Science. Considerable
changes in attitude in the post-war era brought about equal opportunities and gave way to the topic of Home Economics in the late 1960s and 1970s. The National Curriculum (introduced in 1988) did not overtly include Home Economics, so attempts were made to incorporate some of it within the design and technology curriculum; however, the result of this was a greater emphasis on industrial aspects of food production. Twenty years on, Scotland, Wales, Northern Ireland and England are all looking at ways in which to provide children with opportunities to develop practical food skills once again.

As part of the wider school experience, extracurricular activities related to health education have been encouraged by governments. The concept has also been supported across Europe, most notably a tripartite collaboration between the World Health Organization (Europe), the EC and the Council of Europe, in establishing the European Network of Health Promoting Schools in 1992 (ENHPS 2006). In Scotland, the publication entitled The Healthy School (Young & Williams 1989) was used as a basis for local activities until 1990 when Scottish guidance, Promoting Good Health – Proposals for Action in Schools, was produced (SHEG and the Scottish Consultative Council on the Curriculum 1992). More recently, a target has been set for schools in Scotland to gain accreditation as a health-promoting school by 2007 in line with Being Well, Doing Well – A Framework for Health Promoting Schools in Scotland (Scottish Health Promoting Schools Unit 2004). In England, the voluntary National Healthy Schools Programme was introduced under the auspices of Saving Lives, Our Healthier Nation (DH 1999). The programme included a healthy-eating theme, although this only became a core theme of the programme in England in 2005. More recently, the DfES have set a target for all schools in England to have gained Healthy School status by 2009 (DH 2005b).

In England, a commitment was made to provide all children in foundation and year 1 and 2 classes with a free piece of fruit each school day (DH 2000b). After the pilot scheme in 2001, the National School Fruit Scheme reached all schools by 2004, when vegetables were also introduced into the scheme (http://www.5aday.nhs.uk/). A similar scheme – Free Fruit Initiative – is underway in Scotland with P1 and P2 pupils, although this scheme provides only one portion of fruit, three times a week (Scottish Executive 2005b). Other initiatives such as breakfast clubs and healthy tuck shops have been praised and encouraged by the government but rarely received funding in England. The £2 million invested in the School Food Programme in 2002 paid for such schemes to be piloted in a number of schools across England to develop best practice guidance. This resulted in the publication of the Food in Schools (http://www.foodinschools.org) toolkit in 2005. Meanwhile, in Wales, the Welsh Assembly Government have made a commitment to provide all primary school-aged children with the opportunity to receive a free, healthy breakfast each school day through the Primary School Free Breakfast Initiative (Welsh Assembly Government Cabinet 2004). Other published guidance on the ‘role’ of schools in helping children follow a healthier lifestyle includes the 2004 Healthy Living Blueprint for Schools (DfES 2004). This document set objectives to encourage schools to support healthy eating and physical activity.

The link between food and the environment is the focus of one of the most recent school-based initiatives to be launched in England. As part of the 2-year Sustainable Schools Action Plan, it is hoped that food provided in schools will be healthy, ethical and sourced locally. This will reinforce learning throughout the curriculum, which is hoped to cultivate the knowledge, values and skills needed to address the health aspects, and sustainability, of food and drink (DfES 2007). The Year of Food and Farming will run alongside the implementation of this strategy. As part of this initiative, it is hoped that primary stage children will gain experience of food being grown and secondary stage children will take part in countryside activities (DfES 2007). This work links in with the wider DEFRA-led Sustainable Food and Farming efforts, as mentioned in Section 4.2.

4.2: Advances and innovations of the food industry

Arable and livestock production in the UK

In line with CAP, intensification of food production was undertaken to produce larger outputs for the UK market and for export, which in turn has kept the price of food below that of national inflation. As Figure 35 indicates, the food price index has not risen in line with the RPI (DEFRA 2006a). For example, since 1998, food prices have risen by only 8.5% while prices of all items have increased by 21.7% (ONS 2007). Some foods and food groups account for the increase more than others; for example, fruit, vegetables and meat increased in price by less than the RPI for food over the period. The RPI for alcoholic beverages and catering increased above the RPI for all items.

Intensification has relied upon the use of inorganic fertilisers, herbicides and pesticides, high protein animal feed, new farm technology and uniform landscapes (Natural England 2007). Although boosting food pro-
duction was, and continues to be, an important goal, in some instances it has been pursued at the expense of the long-term sustainability of the farming industry and the countryside, as intensification can adversely affect the local flora and fauna (DEFRA 2002). The production of a uniform crop with common characteristics (to make it easier for farmers to grow, harvest, store and sell) and the current practice of farmers to specialise in pastoral or arable farming systems have led to the loss of mixed farmland landscapes, which has discouraged biodiversity.

It has also been suggested that intensification has changed the nutritional value of some foods, as the overuse of the soil depletes it of minerals and overfeeding animals results in them depositing excessive amounts of fat (Ghenremeskel & Crawford 1994). However, comparison of data from UK food composition tables from 1978 and 1995 (Table 15) indicates that the fat content of meat has actually decreased (Paul & Southgate 1978; FSA 2002b).

Inorganic fertilisers, pesticides and herbicides have also received bad press in terms of their potential effect on health, because of the residues some leave behind. A substantial regulatory process is in place and managed by the Advisory Committee on Pesticides (ACP). The ACP, set up in 1985, is a statutory body that advises the government on issues surrounding pesticides. It is their aim that that nobody should be made seriously ill through the use of a pesticide in an approved manner and that any adverse effects on wildlife and the environment should be acceptably small (DEFRA 2005). To monitor the levels of residues to ensure they are within safe limits, pesticide residue testing has been undertaken since the 1950s. Between 1977 and 2000, a government-organised Working Party on Pesticide Residues undertook this role, until an independent Pesticide Residues Committee (PRC) was formed. The PRC is responsible for the surveillance of pesticide residues and reports to ministers, the FSA and the Pesticides Safety Directorate,

<table>
<thead>
<tr>
<th>Table 15 Changes in the fat content of various types of meat, meat products and dishes between 1978 and 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat content (g/100 g)</td>
</tr>
<tr>
<td>Bacon, middle, grilled</td>
</tr>
<tr>
<td>Beef rump steak, lean, grilled</td>
</tr>
<tr>
<td>Beef topside, lean, roasted</td>
</tr>
<tr>
<td>Chicken, light meat, roasted</td>
</tr>
<tr>
<td>Chicken, dark meat, roasted</td>
</tr>
<tr>
<td>Lamb loin chops, lean, grilled</td>
</tr>
<tr>
<td>Pork loin chops, lean, grilled</td>
</tr>
<tr>
<td>Sausages, beef, grilled</td>
</tr>
<tr>
<td>Shepherd’s pie</td>
</tr>
</tbody>
</table>

Sources: Holland et al. (1991); Chan et al. (1995).
informing them of the types, levels and potential intake of pesticides through foods (PRC 2007). Imported food sold in the UK must comply with all UK or EU legal limits on pesticide residues. Residues are found in a slightly higher percentage of imported foods than in UK foods, but according to the FSA, residue levels typically found do not present a health risk (FSA 2006a). However, they have made a commitment to minimise pesticide residues in food because members of the public would prefer to have food that does not contain residues.

In response to consumer concern about the possible interactions between components of mixtures of chemicals (namely pesticides and veterinary medicines), the FSA established a Working Group to assess the risk. The report concluded that there is evidence for limited exposure multiple residues and that such exposure occurs at low levels. A number of recommendations for further research were proposed, and ongoing surveillance was recommended (WiGRAMP 2002).

Changes in the nutrient composition of foods

Although this section is entitled changes to food access and availability, it is important to consider food in terms of the nutrients it provides and therefore briefly consider changes to the availability and access of nutrients. There have been substantial reductions in the fat content of meat over the last 20 years. As summarised by Williamson et al. (2005), this may be the result of selective breeding, changes in animal feeds and modern methods of butchery, new seam butchery techniques at retail level and trimming of fat at the household level. For example, the fat content of carcase meat in the UK has been reduced by over 30% for pork, 15% for beef and 10% for lamb over the past 20 years (Higgs 2000). Changes in the fat content of different types of meat and meat products between 1978 and 1995 are shown in Table 15. More recently, the food industry have been reformulating selected food products to reduce their sodium content in line with the salt reduction targets set by the FSA. This work is part of a wider campaign to reduce the amount of salt in our diets (see http://www.salt.gov.uk).

The fortification of foods was originally called for during the Second World War, so that foods that were being substituted for a common food that had become unavailable because of rationing had a comparable nutrient composition (Ministry of Food 1946). Since this time, fortification of some foods has remained mandatory, such as fortifying bread with calcium and margarine with vitamin A and D (see Nugent & McKeving 2004). Today foods are commonly fortified to restore levels of nutrients lost during storage, handling and manufacture, and for the purpose of enrichment, irrespective of their original nutrient levels (Godfrey et al. 2004), as would be the case for the fortification of foods (namely flour) with folic acid – a debate that has been on the public health agenda for over 15 years (Malcolm 2002; SACN 2006). Fortification of foods has had, and continues to have, a positive impact on our diet, as can be seen in Figure 29 in Section 3. This practice is particularly useful today, as the quantity of food we are eating is decreasing and therefore it is important that the foods consumed are ‘nutrient rich’. To date, the addition of vitamins and minerals to foods has been governed by the UK government. As of February 2007, we are obliged to follow EU regulations that aim to regulate the addition of vitamins and minerals to foods (and the use of certain other substances or ingredients containing substances other than vitamins or minerals) to avoid overuse that could pose a potential risk to consumers (see Aisbitt 2007).

One of the less positive changes in the composition of the foods we eat is the declining content of selenium in breads. This has primarily been put down to the change in supply of wheat, from Canadian or American to European wheat, which contains less selenium. As the selenium content of plants reflects soil selenium availability in their areas of origin, there can be large variations (Broadley et al. 2006). For example, a study assessing selenium content of a range of foods found the widest variation across brazil nuts purchased from 14 different regions; average selenium content ranged from 85 μg per 100 g to 686 μg (Barclay et al. 1995). Broadley et al. (2006) also suggest the levels of selenium in our diets may have declined because of changes in fertiliser practices and modern agronomic practices. White and Broadley (2005) suggest these changes may also account for the apparent decline of copper, magnesium and sodium in vegetables, and copper, iron and potassium in fruit, that they identified by comparing the data on food composition between the 1930s and the 1980s.

The apparent variation in nutrient composition of a produce will depend on the food and the nutrient in question. In some circumstances, when the variation is minimal, it maybe difficult to know whether variations are genuine or are an artefact of measurements. To ensure valid and reliable data on the nutrient composition of foods are available for use across Europe, a 5-year EU-funded project entitled EuroFIR is aiming to develop a comprehensive, coherent and validated food composition databank. EuroFIR is also working to
ensure that a consistent approach is used to measure the nutrient composition of foods, to minimise measurement variations. (For more information visit http://www.eurofir.net)

Changes in food technologies/manufacturing processes and ingredients

The oldest methods of food processing (see Table 16) work by removing water from the food to inhibit microbial or biochemical changes and so to extend the shelf life of foods for distribution and home storage (BNF 1999). Many of the current food technology processes (see Table 16) were the outcome of the ‘technological revolution’ of the post-war period and have played an important role in widening the range of foods available (Henry 1997). These processes also rely on removing the water from foods through heat treatment, or modifying the temperature of the food to maintain microbiological safety. However, it is recognised that some of these forms of treatment can adversely affect the texture, aroma, flavour and nutritional quality of foods; therefore, new technologies have continued to be developed.

Increased ownership of domestic appliances, such as fridges, freezers and microwave ovens (Fig. 36), has also influenced which food processing technologies are commonly used, and the popularity of different types of foods. As noted by Hollingsworth (1974), changes in household facilities, such as the adoption of the refrigerator from the mid-1950s and the domestic fridge-freezer from 1970, had a major influence on food consumption. For example, during the 1970s the variety and choice of freezer foods expanded rapidly. By the early 1980s, ready meals became a popular meal option, and it is believed that their growth was assisted by the increased ownership of microwave ovens from the mid-1980s. This spurred manufacturers and retailers on to promote more products ‘suitable for microwave preparation’ and to introduce products specifically designed for the microwave oven (Young 1986). Today the variety of microwaveable foods has increased substantially and, no doubt, contributed to their growing popularity.

Food experts have reported that over time the more health-conscious consumers are demanding foods that have undergone fewer changes during processing and resemble the original material or have a healthy image (Cottrell 1989; Henry 1997). Providing such foods has been made possible by ‘modern’ food technology, such as high-pressure processing, ohmic heat and pulse electromagnetic techniques, and are used to preserve the nutrients in foods (because of reduced time and temperature of processing).

### Table 16 Food technology processes

<table>
<thead>
<tr>
<th>‘Old’ processes</th>
<th>Current processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun-drying</td>
<td>Spraying drying</td>
</tr>
<tr>
<td>Overdrying</td>
<td>Freeze-drying</td>
</tr>
<tr>
<td>Smoking</td>
<td>Canning</td>
</tr>
<tr>
<td>Salting</td>
<td>Aseptic processing</td>
</tr>
<tr>
<td>Pickling</td>
<td>UHT pasteurisation</td>
</tr>
<tr>
<td>Fermentation</td>
<td>UHT sterilisation</td>
</tr>
<tr>
<td>Freezing</td>
<td>Extrusion cooking</td>
</tr>
<tr>
<td></td>
<td>Irradiation</td>
</tr>
<tr>
<td></td>
<td>Microwave heating</td>
</tr>
<tr>
<td></td>
<td>Reverse osmosis</td>
</tr>
<tr>
<td></td>
<td>Osmotic dehydration</td>
</tr>
<tr>
<td></td>
<td>Modified atmosphere packaging</td>
</tr>
<tr>
<td></td>
<td>Freezing or chilling</td>
</tr>
</tbody>
</table>


UHT, ultra-high temperature.

![Figure 36 Percentage of households that own household domestic appliances (Source: DTI 2007).](image-url)
Recent advances in food technology and production

Genetically modified foods

For some years, scientists have had the ability to select specific genes and manipulate them much more quickly than allowed by traditional methods. Using molecular biotechnology techniques, scientists can now identify genes responsible for particular traits and, using various techniques, can insert them into different organisms to provide a plant with an advantageous trait, over and above the original plant (FSA 2007c). For example, conferring nitrogen-fixation capabilities on a wider variety of plants would reduce the need for expensive fertilizers. Genetic modification (GM) of foods obviously presents an array of opportunities to enable ‘easier’ food production and to produce foods with enhanced health benefits. However, it has also become one of the most controversial issues regarding the future of food supply, with some environmentalists arguing that GM may irreversibly upset the balance of nature (Lang & Heasman 2004). As this is a new area of food technology, any GM foods intended for sale in the EU are subject to a rigorous safety assessment, which is the responsibility of the European Food Safety Authority. Each GM food is assessed for safety, including its toxicological, nutritional and allergenic potential, to health and the environment, on a case-by-case basis before it can be approved for marketing. (For more information, visit http://www.DEFRA.gov.uk/environment/gm/regulation/process.htm)

New ingredients

As well as developments in manufacturing technologies, new ingredients have provided opportunities for new product development. Often these new ingredients have been designed to mimic an original food ingredient; for example, mycoprotein was approved by MAFF, as suitable for being a food, and introduced as a substitute to meat in 1985. Other ingredients have been developed to replace those ingredients, such as fat, sugar and salt, which are recognised to affect our health adversely to varying degrees. However, this is not always a straightforward process. For example, low-salt foods are thought to lack flavour, and therefore overcoming this may require the addition of extra ingredients, which can increase costs and the price of the food (Godlee 1996). Often, preservatives need to be added to compensate for the antimicrobial action of the salt, or foods require specific storage conditions (BNF 1999). Meanwhile, foods containing sweeteners in the place of sugar often require simultaneous modification of the food matrix to replace the properties of sucrose. A number of sweeteners were introduced in the 1980s as consumer interest in ‘slimming’ foods intensified (Keuning 1990) and, in the 1990s, a number of fat replacers became available, after years of safety and efficacy trails. Most frequently, these have been used to replace fat in products with a high fat content (Jones & Jonnalagadda 2006).

Novel foods

Novel foods are defined as a food or a food ingredient that does not have a significant history of consumption within the EU before May 1997 (ACNFP 2007). An example of such a product is Trehalose, a naturally occurring simple disaccharide of glucose (sugar) produced in bacteria and yeast cells, fungi and algae, and a few higher plants. Although of a similar calorific value to sucrose, it is only 40% to 45% as sweet, and may be used to replace some of the sucrose in foods. Since May 1997, a statutory pre-market approval system for novel foods and novel food ingredients has been in place in association with an EC foods regulation. In the UK, the Advisory Committee on Novel Foods and Processes, a non-statutory, independent body of scientific experts, carries out safety assessments of any novel food or process submitted for approval under the EC novel food regulation. (For more information, visit http://www.acnfp.gov.uk/)

Changing shopping cultures

Before the Second World War, food shops specialised in selling only one type of product (e.g. fishmongers and green grocers). Shops offered a counter service and, up until the early 1950s, customers were not expected to serve themselves (Lyon et al. 2004). The main changes to the culture of food shopping started in the mid-1950s as advances that had been delayed by the war began. In particular, the number of shops selling more than one food type (so-called multiples) began to grow, and these were commonly self-service. The substitution of supermarkets for traditional grocer shops was fragmented, with marked differences across the country (Lyon et al. 2004). So, in the early 1960s, over-the-counter shops were still the majority, but by the mid-1960s the supermarkets (classified as at least 4000 ft$^2$ of sales area) were ‘in town’. A number of factors influenced the popularity of the iconic American supermarket; for example, as of 1961, the supermarkets offered ‘added value’ by selling other domestic groceries and toiletries under the same roof for the convenience of the customer. During the 1960s supermarkets began to apply for licences to sell
alcohol. Until this point, alcohol could only be purchased from off-licences. The growing affluence of the UK public from the early 1960s had a substantial effect on what people chose to eat. For example, as more people began to own televisions, cookery programmes became popular and encouraged people to try new recipes and foods. During this period, as average income rose, the proportion of income that had to be spent on food decreased and people began to spend money on luxury goods, quality products and exotic foods, as food and eating was no longer just about sustenance. The affluence of the early 1960s also meant a growing ownership of cars, which enabled some consumers to travel to their nearest supermarket, rather than being reliant on the small independent traders that existed in the local town. By the 1960s, the changes in the food retail sector meant that the whole of the independent sector was selling the same as the leading edge supermarket of the time – Sainsbury’s. In 1969, the largest Sainsbury’s store stocked 4000 lines, compared with 10 years earlier when it stocked only 2500 lines. With improved farming production, supermarkets were able to develop more direct links to suppliers and further increase the range of produce that they sold and, from 1970, supermarkets were able to sell fresh produce out of season, along with ‘exotic’ produce such as avocados. The financial security of large companies provided an opportunity for supermarkets to develop new ‘own label’ products, another reason to entice customers into the store. However, the ever increasing range of products meant more floor space was needed, but with little space available in town centres, there was a need to develop edge-of-town shopping centres (Emerson 2006).

The political climate of the 1970s had huge influences on the trade of food. As inflation on food prices rocketed above the growth of national income, the standard of living declined and the price of food became the most important variable for consumers when choosing where to shop. The key to successful business became the ability to sell large volumes of food while keeping overheads low, which put supermarkets in an advantageous position ahead of the smaller independent retailers. By the 1980s, the supermarkets had such a share of the food retail market that they were ‘competing’ for new customers among themselves, rather than diverting custom from the smaller independent retailers in local towns as had been the case since the mid-1960s. As the number of supermarkets increased during the 1980s, so too did the range of food and, by 1983, a range of ready-to-cook pizzas, ready meals, confectionery and cereals were available, reflecting the growing culture of convenience food and the taste for foods from different nationalities. However, this was accompanied by a drive for ‘healthier food’ and fewer additives (as discussed in Section 4.3). By 1990, other food and health issues had emerged on the scene, including organics and environmental concerns around packaging and waste.

The impact of the changing shopping culture was also on the political agenda at this time, and in particular the concept of food deserts. As noted by the Nutrition Task Force, changes to the food retail provision made it difficult for those individuals without cars to do the weekly shopping. Even if good transport links are available, individuals are limited to how much they can purchase, as they have to carry it from door to door (Nutrition Task Force 1996; Caraher et al. 1998; Robinson et al. 2000). The term ‘food deserts’ became a popular way of referring to areas with poor access to shops selling food; although a definition has never been formalised, government departments and practitioners classified these areas as not having a shop selling food within a 500-m radius (Kayani 2000). However, it should be noted that the concept of ‘food deserts’ is not without its detractors, some of whom have argued that the term had been overused without evidence; for example, Cummins and Macintyre (2002) refer to notion of food deserts as an assumption that has been repeated to the point where people believe it is fact.

As publicised by the Policy Action Team 13 report (1999), poor food access is a particular problem among low-income neighbourhoods hit by retail and service disinvestment. It was noted that living in a ‘food desert’ may exacerbate the problems those on low incomes face in affording a healthy diet (PAT 13 1999). In response, a number of investigations of food access and food poverty were funded, including the Seacroft intervention study, in which a large Tesco store was built within walking distance of a particularly deprived neighbourhood. Using a pre- and post-food intake survey, the study concluded that a positive, but modest impact on diet, was associated with significant shifts in access. Those closest to the retail development and who had the poorest diets in the pre-intervention period reported a significant upward trend in fruit and vegetable consumption (Wrigley et al. 2003), thus indicating that food access is an important determinant of fruit and vegetable consumption at least.

Changes to the way in which we shop has meant that today over 90% of the main household shoppers do most of their shopping in a supermarket and approximately 4% use local shops (FSA 2007b). According to the FSA Consumer Survey, those most likely to use local
shops as their main food source are single adult households, with 75% of all respondents using this type of outlet for some food purchased (FSA 2006b). Since the turn of the century, the biggest change in shopping habits has been the introduction of food shopping through the Internet. The popularity of Internet shopping has remained relatively constant since 2001, with only 2% of respondents to the FSA survey undertaking most of their food shopping through the Internet (FSA 2007b).

Transport and food

Over the past 60 years, the globalisation of the food industry, with an increase in trade and wider sourcing of food within the UK and overseas, has meant a wider range and variety of food products are available all year round (AEA Technology 2005). Thus, the distance that foods have to travel before it reaches the consumer (known as food miles) has increased and involves a variety of modes of transport (Fig. 37).

The improved transport links have made it easier for people to follow the eating habits and culture of their respective country, which is particularly valuable given that 8.3% of the UK population were born overseas (ONS 2001). The change in shopping habits, with people doing their weekly shopping in a supermarket (rather than daily shopping in small towns), has also contributed to the increase in food miles. For example, the average distance travelled by cars carrying food in an urban area increased by 35% between 1992 and 2002 (DEFRA 2006a).

The popularity of supermarkets has also meant most goods are transported via heavy goods vehicles (HGVs), as they are routed through supermarket regional distribution centres, and this has meant that the annual amount of food moved in the UK by HGVs has increased by 23% between 1978 and 2006, and the average distance travelled has increased by over 50% (DEFRA 2006b). The increase in food miles has environmental (e.g. increase in carbon dioxide emissions) and social (e.g. noise from transport) consequences and therefore has recently become a concern to consumers, industry and government (AEA Technology 2005).

The DEFRA (2006b) Food Industry Sustainability Strategy outlines some of the initiatives underway to minimise the impact of food miles and stresses the contribution that consumers can make to achieving sustainable food production though their purchasing decisions. However, it is argued that consumers have not had access to adequate information about the origins of the food they buy to help them make more sustainable choices. To help increase consumer awareness of the origin of foods, the government is pressing for EU labeling rules to be extended to include origin marking (DEFRA 2006b).

Figure 37  UK food vehicle-kilometres by mode of transport (2002).
(Source: DEFRA 2006b).

Employment rates:1 by sex

United Kingdom

Percentages


Men

Women

All

Figure 38 Employment rates, by sex.

1 At spring each year. Men aged 16 to 64, women aged 16 to 59. The percentage of the population that is in employment. Data are seasonally adjusted and have been adjusted in line with population estimates published in autumn 2005. See Appendix, Part 4: LFS reweighting, and Historical LFS-consistent time series.

Source: Labour Force Survey, Office for National Statistics
4.3: Consumer-led changes

Changes-led by changes to society and lifestyle

Employment among women has been rising steadily for a number of decades (Fig. 38). This has been coupled by rates of employment decreasing among men. However, it is notable that, as Figure 39 shows, among men the main reason cited for economic inactivity is long-term sickness or disability, whereas among women it is looking after family or home. This is also likely to be the reason that a large percentage of women work part-time; over a quarter of employees were working part-time in spring 2005 and around 4 in 5 part-time employees were women.

The first BNF (1982) monograph published in 1982 noted that ‘one of the most striking recent changes in society has been the changing role of the women’. Given that it was traditionally the women’s role to prepare food for the family, this change in society has led to changes in eating habits and the types of foods consumers require. So too has the trend for fewer people per house. For example, the proportion of people living alone has increased from 18% in 1971 to 29% today, with the major changes in those aged 25–44 years (Fig. 40; ONS 2006d).

Eating habits and food preparation

In a recent survey, the most commonly cited reason for not cooking from scratch was a lack of time (FSA 2007b). In the UK in 1980, the average time taken to prepare the evening meal was 90 minutes, which fell to 30 minutes in the 1990s and was recently measured at 20 minutes (DH 2003). Concerns regarding the growing trend for families not eating together, as family members required meals to be cooked for them at different times throughout an evening, were highlighted in a survey among housewives.

![Figure 39 Reasons for economic inactivity for all ages 16–65 years: by sex, 2005.](image1)

![Figure 40 Changes to the number of people per house (Source: ONS 2006d).](image2)
in 1973. Even then, the past was reflected on with rose-tinted glasses, as many of the women questioned aspired to spend more time to prepare better meals, and felt that they would get much satisfaction from that (BMRB 1973). It seems that not much has changed in our aspirations for culinary novelty: in 1953, 59% of British adults told Gallup they liked to try out something new for dinner (Mori 2003). A survey of attitudes and behaviour of eating in 1984 also found that women liked the idea of creative cooking, but the opportunity was not that frequent and, in 1999, a MORI Social Values survey found that 68% of those questioned agreed ‘I love trying out new dishes’ (Mori 2003).

Today the increasing number of cookery programmes and recipe book sales suggest that interest in cooking is high. Yet the increasing sales of ready-prepared meals (see Fig. 41) are likely to reflect a reduction in cooking from scratch. A Mintel report in 2002 found that ready meals are used in 77% of households (Mintel 2002). Of those that use ready meals, 28% use them more than once a week, 26% once a week and 44% three times a month or less frequently. The chilled ready-meals market has grown considerably in recent years. In 2001, this was 90% higher by value than 1997. The frozen-meal market has also seen growth since 1999 and in 2002 held 40% of the market, while room temperature (including instant hot snacks) represented 7% of the market (Mintel 2002). Ready meals are eaten most frequently by 15- to 19-year-olds (and least by the over-64s), which perhaps illustrates the trend for different members of the family requiring meals at different times of the evening, and exemplifies the sea change to less formal eating habits and individual eating (Phillips 1983; Mintel 2002). The increasing proportion of working women and increasing affluence are likely to have contributed towards the trend of individual eating of the 1980s (Gray 1983). However, because of a lack of longitudinal data on issues such as meal patterns and eating habits, it is difficult to prove (King 1983).

**Take-aways**

Take-away foods are classified as meals brought home that are ready to eat without cooking or heating and therefore are quick and convenient. The popularity of take-aways has grown; for example, in 1979 the average amount of money per week per person spent on take-away chips was 2p, compared with 18p in 2005–2006 (taking account of current prices) (DEFRA 2007b). Much of the growth of take-away catering establishments took place during the 1970s and 1980s; for example, in 1984 take-aways accounted for 27% of meal occasions compared with 14% in 1975 (Heald 1987). Over the past 60 years (modified) ethnic food (Chinese, Indian, Thai, Italian etc.) take-away outlets have become particularly popular. For example, between 1975 and 2005–2006, the average quantity of pizza per person per week increased from 2 g to 22 g (DEFRA 2007a; Fig. 42). Ethnic-food sales via take-away and restaurants were worth approximately £3.2 billion in 2003 (LFI 2004). Mitchell (2006) relates the incorporation of ethnic dishes to the UK diet to changes in the ethnicity of the UK population brought about by immigration, and widespread travel.
Eating out

Trends in eating out over the past 60 years have changed substantially. During the war, communal centres for eating became common practice, particularly for those whose employment did not allow them home, and for those whose families had been broken up by evacuation or their jobs, also occasional meals eaten in catering establishments were additional to the domestic ration. There was no limit to the total amount of food obtainable by the caterer, and the allocation depended on how many meals were served, while industrial canteens and schools had special allowances. In rural areas, where a factory canteen or restaurant were not available, meat pies, snacks and sandwiches were provided. The fact that meals could be obtained ‘off the ration’ in restaurants led to an increase in the number of establishments and meals served; for example, in May 1941, 79 million meals were served weekly in catering establishments, and by December 1944 this had risen to 170 million (Ministry of Food 1946).

Between 1975 and 1984, the average number of meal occasions eaten ‘out’ declined by 16%. This was primarily because of a massive 47% decline in meal occasions at the place of work and a 43% decline in the number of occasions that children consumed school meals (see Heald 1987). These trends can be explained by a decline in British industry and subsequent closure of large factory canteens, and a drop in the school population and school meal subsidies. The commercial sector saw an increase of 7% in eating occasions and an increase in the number of people eating out (Heald 1987). This could be explained by the increasing popularity of takeaways, including bakers, fish and chips and fried chicken outlets, which saw the largest growth among the commercial sector (Heald 1987). During the 1970s and 1980s, public houses also became popular places to eat and, later on in the decade, the Steakhouse concept was epitomised in the UK by Bernie Inns and Beefeaters (Leatherhead Food 1986; Payne & Payne 1993).

The catering market was affected by the recession from the autumn of 1990, during which it saw little growth. Payne and Payne (1993) attribute this to the high interest rates and the loss of custom, as many people stopped eating out, or cut down on their orders.

After the stagnation of the market in the early 1990s, the hotels, catering and pubs industry was the sixth fastest growing industry between 1992 and 2004, as people continued to eat out more regularly. Although household spending on fresh and processed food and drink products was up 53.4% between 1992 and 2004, over the same period, spending on food and drink products consumed outside the home grew by 102.2% (Fig. 43), so that household spending on eating out is now more than eating in (ONS 2006d).

Ethical food policies

The emergence of ethical food policies is relatively recent and has been defined as ‘thinking about where your food has come from’. Quality, health and sustainability were also quoted as motivating factors for purchasing ethically produced/sourced foods (IGD 2006b). Ethical consumerism has become important to some aspects of the food industry. For example, the leading supermarket retailers...
are also making efforts; in autumn 2006, the three leading UK retailers announced that they would sell organic vegetable boxes, as well as encourage customers to cut down on the number of biodegradable carry bags they used and switch to biodegradable packaging (Grocer 2007). Looking at the origin of foods has also become important to some consumers, as this can be an indication of animal welfare, sustainable production and the environmental impact of producing the food (FSA 2000). This is a particular issue with fish for example, as some fishing techniques can affect the environment through resultant physical damage (Foster et al. 2006).

Demand for organic foods has been increasing year on year since the early 1990s (Fig. 44) and in 2005 the UK organic food market had a retail value of just over £1.6 billion. In 2005, 76% of sales of organic produce originated from the multiple retailers, although this has been declining over the past few years, as box schemes, farmers’ markets and farm shops become more popular (Soil Association 2006). However, as a percentage of foods sold, organics still remain a relatively small sector of the food market. The exact proportion varies depending on the food, for example: in 2005 only 1% of the beef sold was organic; organic eggs contributed to 3% of the total egg market in 2004; and organic milk contributed 6% of milk sales in the major retailers in 2006 (Soil Association 2005; RMIF 2006; OMFL 2007).

Even with price inflation (associated with lower productivity of organic crops), organic foods have become popular as some consumers have become concerned about the impact of intensification (discussed earlier) on the nutrient composition, and the health implications of pesticide residues and pharmaceuticals found on or in foods. Although, as reviewed by Williamson (2007), there is little conclusive evidence to support claims of these health benefits, benefits to the environment and improved animal welfare are also cited. The authenticity of organic foods can be a concern for the consumer, as they rarely look very different from mainstream foods. Therefore, clear labelling and strict regulations have been set. For a product to be labelled ‘organic’, it must have been produced in line with the EU Regulation [Council Regulation (EC) No 1804/1999 of 19 July 1999]. In the UK, the Soil Association certification mark is found on some foods if the producer applies to be certified, and thus indicates that the food was produced and processed to animal welfare and environmental standards set by the Soil Association (2007). Over the past 20 years, other ethical concerns have influenced consumer demand for certain foods. Where the food has been produced, and in particular the ‘food miles’ (see section 4.2), has become important for those consumers who prioritise the environmental impact of the food they consume when selecting foods. Consumers perceive locally produced foods a positive thing, not only because of the reduction in food miles but because they also perceive these foods to be fresher and of better quality (IGD 2006a). However, it should be noted that there is no standard definition of local food and, to date, people have just trusted farmers’ markets and farm shops to be authentic. An IGD (2006a) survey identified that the main barriers to purchase for those who would like to buy local produce is the price. Some consumers also have ethical concerns about trade practices and thereby opt for ‘Fair Trade’ produce, whereby certain products are sold with the intent that a substantial share of the products’ profit is given back to the grower. Many of the foods marketed as Fair Trade rely on ingredients from developing countries, where food is an important source of income because of the lack of other resources. UK sales of goods branded with the Fair Trade маркетинг как инструмент продвижения экологически чистых продуктов.

**Figure 44** UK organic retail market growth (Source: The Soil Association 2005).
Trade mark hit £195 million in 2005, as reported by the UK Fairtrade Organisation (2006; Fig. 45).

Food and health

Additives

Along with the rising popularity of convenience foods, there has also been increased pressure for more ‘natural’, less obviously processed and preserved foods (Cottrell 1989). A good example of this has been the additives story. Consumers have aired their concerns about food additives since the mid-1970s, when the EC took the initial steps of introducing the E number labelling system for food additives, which was intended to be informative and reduce confusion.

Some consumers became convinced that additives were dangerous chemicals to be avoided at all cost, particularly by children because of claims of hyperactivity following ingestion of foods containing particular additives. Consumer fears were fuelled by various books and articles throughout the late 1970s and 1980s, after which consumers began to put pressure on food manufacturers for foods free from artificial additives (LFI 2006). However, by the mid-1990s, consumers’ interest in additives had begun to wane, perhaps because interest in organic and natural foods had begun to rise, and other health issues started to come to the fore, particularly food scares (e.g. BSE). Consumers also started to become more aware of some of the potential benefits of additives, including improved appearance and increased shelf life (LFI 2006). However, during this decade, concerns around additives have been in the media again, as illegal food dyes Sudan 1 and para red were found in foods during standard FSA testing procedures (FSA 2006c).

Functional/pharmaceutical foods

Consumer interest in food and health has opened up a market for new foods that are promoted on the basis of their ability to promote good health and/or disease-preventing properties, over and above their nutritional function. Such foods are termed ‘functional foods’ (although there is no strict definition) and invariably carry some sort of health claim, although manufacturers by law cannot make a claim that the food is capable of preventing, treating or curing human disease (Webb 2006). Functional foods encompass a broad range of products, including staple everyday foods fortified with a nutrient that would not normally be present (e.g. folic acid-fortified cereals) and foods generated around a particular functional ingredient, such as:

- margarines and other products with high levels of plant sterols/stanols to inhibit the absorption of cholesterol from the gut and thus lower blood cholesterol;
- dairy products containing probiotics, which are live cultures of bacteria aimed at improving the microbial balance of the gut;
- prebiotics, which are said to promote the growth of certain bacteria within the gut, and usually comprise non-digestible food ingredients;
- eggs containing long-chain polyunsaturated fatty acids (IGD 2005b).

Industry sources suggest that the market is still evolving, with product ranges expanding rapidly as soon as new functional ingredients emerge (Mintel 2006a).
Sales of functional food and drink in the UK increased by 523% between 1998 and 2003, and in 2004 it was estimated that they would increase by 106% to reach a market value of £1720 million by 2007 (Mintel 2006a; see Fig. 46). A number of factors are responsible for the increase in sales of functional foods, including: the increased awareness and interest in the association between diet and health; more disposable income among some subgroups of the population; and the ageing population, who are interested in optimising good health for as long as possible (IGD 2005b). However, functional foods remain a niche market primarily because of their increased cost.

### ‘Superfoods’

So-called superfoods are positioned closely to functional foods and marketed as naturally healthy food products. There is no official definition of a superfood and the term is currently being used to include a number of different foods with different properties. It is generally assumed that ‘superfood’ encompasses a wide range of natural foods, all with intrinsic components that are believed to have beneficial health effects. However, often the strength of the claims being made is not matched by the strength of the evidence required to support them and, in most cases, more studies are needed before any disease-specific associations can be made (Lunn 2006). Nevertheless, regardless of the validity of the term, ‘superfoods’ are beginning to have an impact on the types of foods made available as well as the popularity of foods when they are initially branded a superfood (IGD 2005c). Any encouragement to increase fruit and vegetable intake is welcome and the general message to promote consumption of these foods, some of which have been commonly consumed in the past and are now becoming popular again, is generally sound.

### Healthier ranges and slimming products

The market for low-calorie and slimming products opened up in the mid-1980s, as the food industry began to recognise that the health implications of our diet was becoming an important issue with consumers (Wheeldon 1997). Tesco was the first retailer to launch its own healthy eating brand with nutritional criteria in 1985. The food industry developed more foods to appeal to the health-conscious and rebranded those that already had a beneficial nutrient profile as being healthy, such as wholemeal fish fingers, calorie-counted ready meals, canned fruit without added sugar and low-fat spreads (Slattery 1986).

The increasing prevalence, and awareness, of overweight and obesity has also encouraged the growth of a market for low-calorie and low-fat products, and specific ‘slimming products’. Today these foods are benefiting from an even larger customer base: in 1998, 30.3% of all adults were trying to slim; in 2005, this had increased to 34.5%. Sales data also illustrate this; since 2000 there has been a 44% growth across the market for these foods, with dairy products accounting for over one-third of the market at £690 million and confectionery accounting for 17% of the sector (Mintel 2006b). Specific dieting products available on the market to accompany dieting approaches, such as ‘low carb’, Weight Watchers and the GI diet, have also become popular. For example, in 2004 the ‘low carb’ market was worth £25 million, compared with £5 million in 2002 (Mintel 2006b).

### Lifestyle and physical activity

However, the increasing popularity of slimming foods seems to have been little use in weight management against the tide of declining levels of physical activity.
There are many difficulties in accurately assessing an individual’s physical activity levels, and consequently comprehensive data on recent trends in adults across the UK is not available (DH 2004c). However, there are clear indications that such levels have been in decline for some time. Current levels of physical activity are a reflection of personal attitudes about time use and of cultural and societal values. They also reflect how conducive our homes, neighbourhoods and environments have become for more inactive living. General societal changes have also contributed to a decline in physical activity, including:

- reduction in occupational physical activity;
- greater use of the car;
- decline of walking – personal safety, especially of children, women and older people;
- increase in energy-saving devices in public places, for example escalators, lifts and automatic doors;
- reduction in physical education and sport in some schools;
- adult fears of children’s safety in unsupervised play;
- substitution of physical activity leisure with sedentary past times such as watching the television, playing computer games and surfing the Internet (POST 2001).

Such changes are evident when modes of transport are considered. Motor vehicles travelled 499 billion kilometres in total on Great Britain’s roads in 2005 (DFT 2006; Fig. 47). This was eight times more than in 1952. There was almost continuous growth until 1973. Since then the trend has continued upward, but annual changes have been more erratic. Just under 80% of road traffic distance, including pedal cycles, was accounted for by cars and taxis in 2005. This compares with less than 40% in 1952.

In an attempt to increase awareness of the health benefits of being physically active, the Chief Medical Officer made a recommendation that adults should undertake a total of at least 30 minutes a day of at least moderate intensity physical activity on five or more days of the week. Evidence indicates such levels of activity can help reduce the risk of premature death from CVD and some cancers, significantly reduce the risk of type 2 diabetes, and it can also improve psychological well-being (DH 2004c). However, in 2003 the percentage of adults meeting the recommendations for physical activity in England declined with age for both sexes when compared with data from 1997. Men were more active than women in every age group and their activity levels declined steadily with age. For women, activity levels remained the same until the 45–54 years age group, and then declined.

Conclusions

Over the past 60 years, there has been a steady increase in life expectancy at birth because of a number of improvements in public health. However, healthy life expectancy has not increased at the same rate and the progression of many prevalent chronic illnesses often dictates that many of the ‘extra’ years towards the end of life are spent in poor health. As a consequence, the focus of public health nutrition is now turning towards
improving health and quality of life in later years. This is evident in the sea change that has occurred in the nature of national food policies. Sixty years ago, UK food policies focused on ensuring sufficient nutrients were available in the diet, particularly for those on low incomes. However, since the early 1990s, policies have focused on improving the nutrient profile of the diet, through multi-agency approaches.

Despite the social and economic turbulence that affected food availability since the end of the Second World War, the overwhelming impression of the UK diet has been one of stability. However, there have been dramatic changes in the amounts and types of foods available as the broadening capabilities of the food manufacturing industry have meant a wider range of products available. Such products have been welcomed by consumers and have resulted in a varied and convenient diet.

Dietary recommendations have been made in the UK since 1950 with the explicit aim of improving the nutritional make-up of the diet. Expert panels have also been asked to provide advice on a number of diet-related diseases and, in many cases, this has also led to population-wide dietary recommendations. Public and industry response to such recommendations have brought about changes to the nutrient composition of the diet. Total energy intakes peaked in the 1950s at 2660 kcal per person per day. This has now fallen, along with declining levels of physical activity, to 1750 kcal per person per day. The percentage of energy coming from carbohydrate slumped during the 1960s and 1970s, but has been gradually increasing to 50% in 2000. This is still lower than the 53% in 1940. This has been attributed to the contribution that cereals and cereal products have made towards the energy content of the diet. Throughout the 1950s, 1960s and 1970s, animal products were consumed at the expense of cereal products, resulting in a gradual replacement of carbohydrates by fats. However, since the 1980s, this trend has been reversed and cereals and cereal products have made an increasing contribution to the total energy intake.

Despite improvements in the nutritional profile of the diet, as a nation, our declining energy expenditure has left us prone to gaining weight. Arguably, what foods are available is influenced by consumer demand and, as demand for healthier convenient foods increased, the food industry responded by introducing a number of products on the market throughout the latter decades of the last century. Nevertheless, the national girth continues to increase, and great challenges face policy makers and the food industry.

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