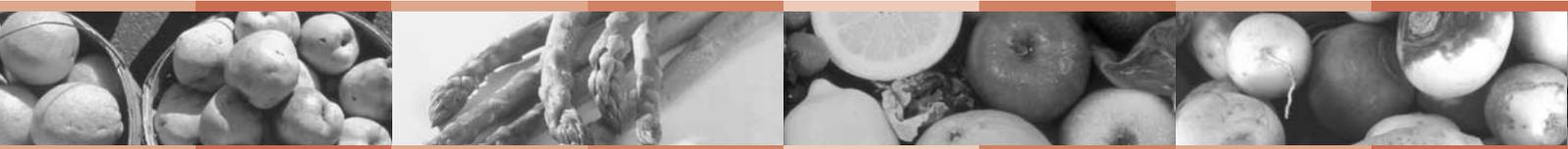




# Food, Nutrition and Cardiovascular Disease Prevention in the European Region: Challenges for the New Millennium

may 2002







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## Report prepared by the European Heart Network's Nutrition Expert Group

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### The European Heart Network (EHN)

The European Heart Network is a Brussels-based alliance linking 30 national heart foundations and other national non-governmental organisations committed to the prevention of cardiovascular disease, in particular coronary heart disease and stroke, in 26 countries across Europe. EHN's mission is to play a leading role in networking, collaboration and advocacy in the prevention and reduction of cardiovascular disease so that it will no longer be a major cause of premature death and disability in Europe.

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## Preface

This policy position paper updates a previous policy position paper: *Food, Nutrition and Cardiovascular Disease Prevention in the European Union*, published in 1998, in which the European Heart Network (EHN) first set out a summary of the current thinking on the relationship between diet and cardiovascular disease (CVD). The paper aimed to achieve concerted action on CVD prevention within Europe and to promote the exchange of experience and cooperation on CVD prevention between EHN's members. It called for a European Food and Nutrition Policy to be developed and set out provisional dietary goals for Europe. We are pleased to report that there has been considerable progress since then. The European Commission's Eurodiet Project, set up to begin developing a public health nutrition programme for the European Union (EU), published European dietary goals in 2000. In December 2000 the Council adopted a resolution on nutrition, asserting the importance of nutrition for health and inviting Member States of the EU and the Commission to take action to promote better nutrition. The World Health Organization's Regional Office for Europe (WHO EURO) has also developed a Food and Nutrition Action Plan.

This new policy position paper embraces the wider European region, reflecting the fact that more than half of the EHN's members are from countries outside the EU and that the EU is undergoing progressive enlargement. It presents population dietary goals for Europe as proposed by the Eurodiet Core Report and provides an up-to-date synopsis of the current consensus of scientific thinking on diet and the prevention of CVD. It goes on to examine what needs to happen next to put the recommendations of Eurodiet, the Council resolution and WHO EURO into place and, in particular, what national heart foundations, health professionals concerned with the prevention of CVD, and informed members of the public can do to help. Although beyond the scope of this paper, the EHN recognises that activities to prevent CVD through diet need integration into an overall health strategy for Europe.

This policy position paper is aimed primarily at those seeking to lead the food and nutrition policy debate at national level as well as those developing or refining national nutrition plans. A summary of this paper with the same title is aimed at informing European policy makers of the importance of integrated food and nutrition policy.

A review of progress towards the recommendations of this paper will be undertaken in three to five years time.

## Executive summary

The European region is facing a huge forthcoming burden from cardiovascular diseases (CVD). In Central and Eastern Europe CVD rates are rising alarmingly. In Western Europe, huge numbers are already living with cardiovascular impairment. The demographic effect of an ageing population in the West and the deteriorating health and economic situation in the East mean that unless there is concerted action to prevent CVD, the European region will be confronted with a large increase in the number of people with CVD in the years to come.

A concerted effort to achieve population dietary goals proposed by the Eurodiet Core Report and other consensus documents could significantly reduce the burden of CVD and other chronic diseases. The Eurodiet Core Report summarises the consensus developed by a range of different international and national professional groups over the past two decades. The population goals represent a recommended average intake or level, so subgroups of the population, such as infants and children, pregnant women and older people, will have different requirements. The goals are not intended to guide individual consumption but are designed to inform food policy.

Quantified population goals allow policy makers to make direct comparisons between the current dietary intake of their population and the recommended dietary patterns. This information can be used to devise action plans which allow time for change towards recommended dietary patterns. In cases where the gap between current intakes and recommended dietary patterns is wide these action plans should probably include interim population goals.

The five most important population goals for the prevention of CVD across Europe are:

- **saturated fats and trans fats** – population goals of less than 10% of energy from saturated fats and less than 2% of energy from trans fats. High intakes of saturated fats and trans fats raise cholesterol levels and significantly increase risk of CVD. High blood cholesterol levels in the population exacerbate the dangers of smoking and high blood pressure for CVD risk. Policy needs to be directed towards changing the composition of fats in the food chain from saturated fats and trans fats to mono and polyunsaturated fats;
- **fruit and vegetables** – population goal of more than 400g/day. Diets rich in fruit and vegetables are protective against the wide range of chronic diseases affecting the European region, including CVD. Fruit and vegetables contain a vast array of beneficial compounds which, acting together, appear to be responsible for their protective effect. Policy needs to be directed towards increasing the supply of, and access to, fruit and vegetables, and to reducing their price;
- **salt** – population goal of less than 6g/day. Reducing salt intakes lowers blood pressure and risk of CVD in people with normal blood pressure as well as in people with hypertension. Much of the salt in people's diet is derived from manufactured foods. Policy needs to be directed towards a blanket reduction in salt in manufactured foods; and
- **Body Mass Index** – population goal of a BMI of 23 and **Physical Activity Level** – population goal of a PAL of 1.75.<sup>1</sup> Obesity and overweight increase the risk of CVD and non-insulin dependent diabetes mellitus (NIDDM). The prevalence of obesity, overweight and diabetes in Europe is rising dramatically. Obesity can be prevented by the adoption of healthier diets and an increase in physical

<sup>1</sup> BMI: Body Mass Index measured in kg/m<sup>2</sup>; PAL: Physical Activity Level as the ratio of the total energy expenditure to the estimated basal metabolic rate.

activity. A PAL of 1.75 (which is equivalent to 60 minutes per day of moderate activity or 30 minutes per day of vigorous activity) is necessary to limit weight gain on typical European diets. However, 30 minutes a day of moderate activity will also have a significant impact on the risk of CVD. Policy needs to be directed towards providing opportunities for incorporating physical activity into the daily lives of Europeans in order to achieve a lowering of BMI.

Concerted action to achieve these population goals will be necessary at both national and European levels. National heart foundations can be key players in initiating, encouraging and working with governments to develop national action plans to improve the dietary health of the population, and many national heart foundations are already actively engaged in this. National plans – which will differ from country to country – should be developed through systematic analyses involving assessing current nutritional situations in relation to the population goals and identifying opportunities for achieving those goals.

EHN is working to promote the development of plans for action at European level. It considers that:

- There needs to be a comprehensive and integrated European food and nutrition policy.
- In order to develop and implement this policy there need to be new structures involving senior policy makers.
- Political commitment to improving nutrition should be sustained by publishing a regular report on the state of nutritional health across Europe.

## A. Introduction

Cardiovascular disease (CVD) is a major public health challenge for all of the countries in Europe, irrespective of how 'Europe' is defined. The food, agriculture and trading policies of European countries impact on one another, whether they are current members of the European Union (EU), aspiring members or neighbouring countries. It is estimated that poor diets are responsible for about a third of CVD [EHN 1998]. As dietary patterns

### Definition of European Region

In this report, the European region refers to the 51 member states of the World Health Organization's European Region, stretching from Iceland in the West to Kazakhstan in the East, and including the 15 countries of the European Union.

across Europe are becoming increasingly similar, so are their consequences for long-term health.

National governments play a vital role in promoting healthy nutrition through national policies and

strategies. Governments have a responsibility to ensure that their citizens have access to a choice of affordable and healthy food and to provide the population with clear, accessible information about what constitutes a healthy diet. Many national governments have set dietary goals for their populations. But, as many in the field of public health have long been arguing, there is also a need for action at the European level. There has also been a tendency for the role of international structures, such as the World Health Organization (WHO) or the EU, in relation to nutrition to be overlooked. But several European initiatives on nutrition and health are underway.

The World Health Organization's Regional Office for Europe (WHO EURO) recently undertook a major initiative to develop a food and nutrition policy document and action plan for the period 2000-2005. The Action Plan is directed at reducing levels of non-communicable disease, protecting the health of adults and children, and assisting Member States to develop effective systems to deal with food and nutrition issues. It was endorsed in September 2000, and will culminate in a WHO

Regional ministerial conference in 2005 to take stock of progress on food and nutrition, when member states will be asked to report on their actions under the plan. A mid-term evaluation meeting will take place in 2003. WHO EURO has developed a training module, and is now in the process of running workshops, to help Member States developing and implementing national food and nutrition action plans.

In the EU, there have been several recent developments aimed at promoting healthy nutrition. The establishment of the Eurodiet Project in 1998 can be seen as a first step towards the development of a Europe-wide public health nutrition programme. In January 2000, a White Paper on Food Safety, which called for the development of comprehensive and cohesive nutritional policy for Europe, was published. The White Paper on Food Safety also proposed a European Food Authority whose remit would cover certain aspects of nutrition. This body now has been established, but is called the European Food Safety Authority.

In December 2000, a Resolution on Nutrition was adopted by the Council and a Nutrition Action Plan for the EU is to be developed (see Annex I for further details of these EU initiatives).

Both WHO and the Eurodiet project recommend the establishment of new European-level structures to facilitate collaboration and provide guidance on how to reduce the burden of food-related ill health in Europe. WHO EURO and the EU clearly have an important role to play, and both call for action at the national level to improve food and nutrition. Nonetheless, it is the responsibility of national governments to assess the nature and scale of their domestic dietary health problems, and to devise strategies for improvement which are culturally and socially appropriate for their country.

National heart foundations can be key players in initiating, encouraging and working with governments to develop national action plans to improve the dietary health of their population. This paper describes an analytical method that will enable policy makers to identify where changes need to be made to facilitate the attainment of population dietary goals as proposed by the Eurodiet Core Report. This involves a comprehensive analysis of how the food chain is organised from farm to factory, from port to retailer and into the home, and what influences the nutritional content of foodstuffs as they pass down the food chain.

EHN members are primarily concerned with prevention of CVD, but the majority of dietary and lifestyle influences on CVD are shared with cancer and the other major chronic diseases affecting the European population. Actions designed to reduce CVD rates would have a positive impact on other conditions and improve the general health and well-being of the population.

Any discussion of CVD prevention needs to consider the wider context of the influences on diet and health. Efforts to improve nutrition and health need to go hand in hand with efforts to improve food safety and move towards a more environmentally sustainable food supply. The current sense of crisis in the European food supply, due to Bovine Spongiform Encephalopathy (BSE) and foot and mouth disease, has sounded a strong warning to European consumers that things are not right with the European food chain. This is an opportune time to review how food, agriculture, trade, transport and health policies in Europe are inextricably linked and to look for ways of revising the food supply to improve public health as well as restore consumer confidence.

## **Burden of cardiovascular disease in Europe**

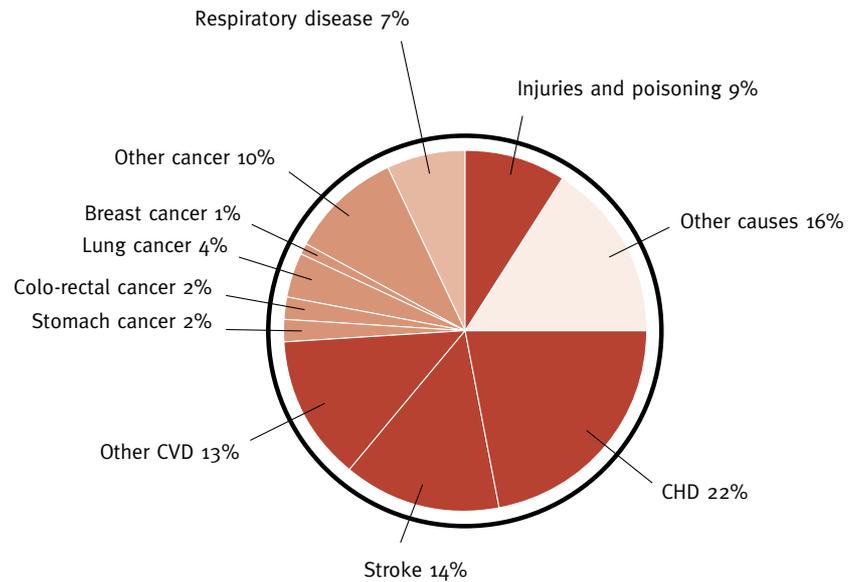
Cardiovascular diseases (including coronary heart disease and stroke) are the main cause of death and a major cause of premature death in Europe, accounting for 49% of all deaths (Figure 1) and 30% of all deaths before the age of 65 (Figure 2). One in eight men and one in 17 women die from CVD before the age of 65 [British Heart Foundation 2000]. CVD also accounts for 19% of all Disability-Adjusted Life Years (DALYs) lost in Europe (Figure 3).

It is essential that policy makers and the public put food-related ill health into perspective. Currently there is an understandable crisis in confidence in the food supply which stems from concerns over food safety, but it should be remembered that nutritional imbalances account for over a hundred times more preventable deaths than food-borne infections.

Europe faces a huge forthcoming burden from CVD. In Western Europe, although mortality rates from CVD have gradually declined, the prevalence of CVD is predicted to increase. The risk of chronic disease increases with age; improved CVD treatment and survival rates, coupled with an ageing population, mean that it is likely that an increasing number of Europeans are living with impaired cardiovascular health. Europe's population is presently the oldest in the world. In 1995, almost one in six citizens of the EU were over the age of 65. By 2050 one in three will be over 65, and one in ten over 80 [Eurodiet Project 2001].

Countries in Central and Eastern Europe are faced with a very different situation. Health trends were similar to those of Western Europe until the late 1980s, but thereafter they have diverged markedly, with an alarming rise in mortality rates

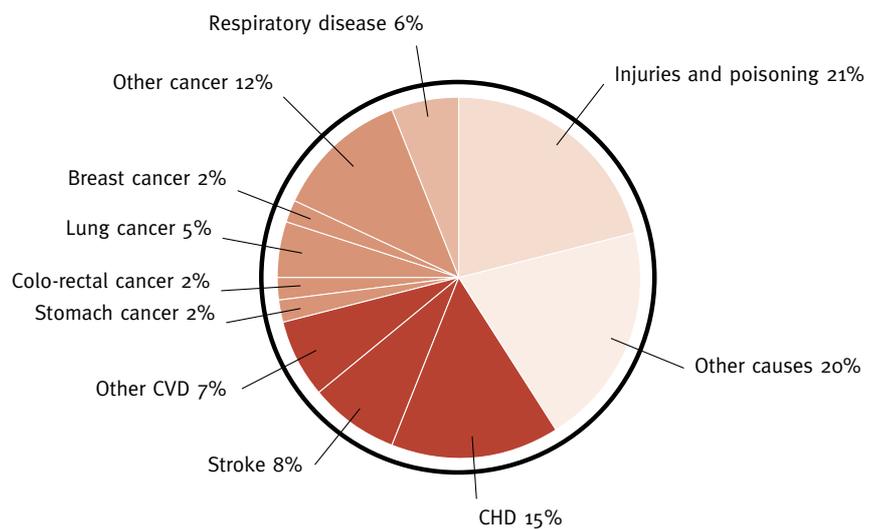
**Figure 1. Deaths by cause, latest available year, Europe**



Source: Rayner, M., Petersen, S. (2000) European cardiovascular disease statistics. British Heart Foundation: London. ([www.heartstats.org](http://www.heartstats.org))

CVD is the main cause of death in Europe accounting for 49% of all deaths. CVD is the main cause of death for both men and women in all European countries with the sole exception of France where more men die from cancer.

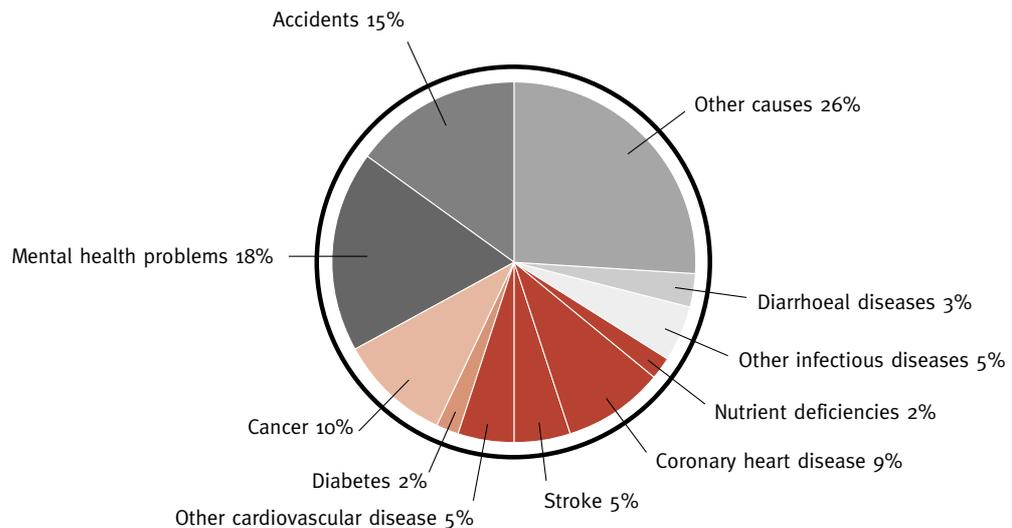
**Figure 2. Deaths under 65 by cause, latest available year, Europe**



Source: Rayner, M., Petersen, S. (2000) European cardiovascular disease statistics. British Heart Foundation: London. ([www.heartstats.org](http://www.heartstats.org))

CVD is the main cause of early death in Europe accounting for nearly 30% of all early deaths. One in eight men and one one in 17 women die from CVD before the age of 65.

**Figure 3. The major causes of lost DALYS (Disability-Adjusted Life Years), 1990, Europe**



Source: Murray, C.J.L., Lopez, A.D., (1996) *The Global Burden of Disease*. WHO: Geneva.  
 CVD is the major cause of DALYs lost in Europe. All together, diet-related diseases (CVD, cancer, diabetes and nutritional deficiencies) account for 33% of DALYs lost whereas food-borne diseases (some diarrhoeal diseases and a tiny minority of other infectious diseases) account for about 3% of DALYs lost.

from chronic diseases and a shortening of average life expectancy. In Romania, for example, CVD mortality rose by 41% between 1984 and 1994. There is up to a 10-fold difference in premature mortality rates between Western Europe and countries in Central and Eastern Europe (Figures 4 and 5). These vast differences in CVD mortality rates are attributable to differences in environmental, non-genetic risk factors, like diet,

tobacco smoking and physical inactivity, as well as declining access to treatment.

The demographic effect of an ageing population in the West and the deteriorating health and economic situation in the East mean that, unless there is concerted action to prevent CVD, the European region will be confronted with a large increase in the number of people with CVD in years to come.

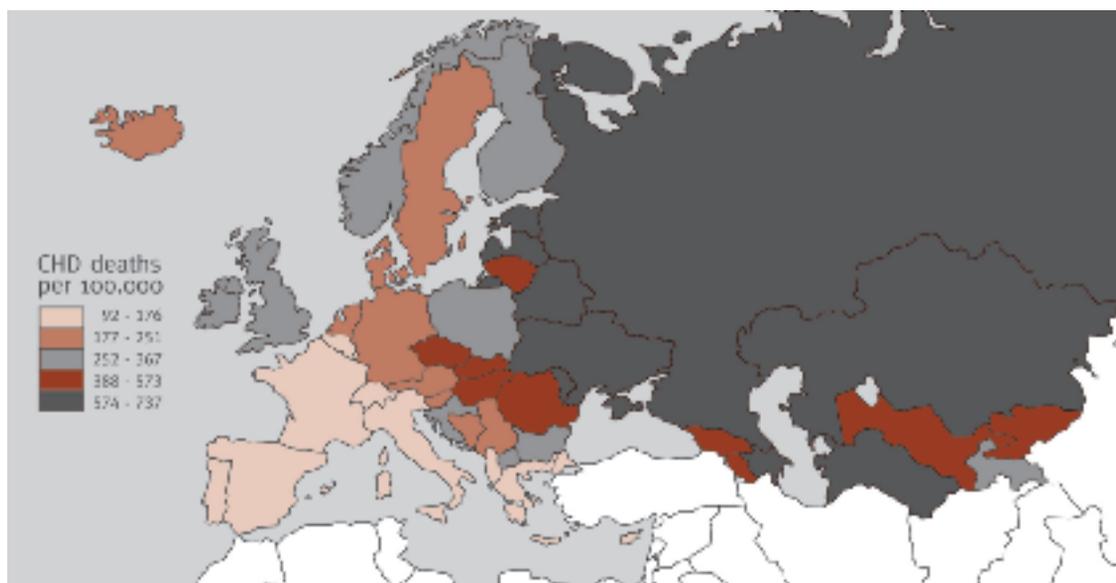
### Paying the price of CVD

The burden of CVD has an economic, social and personal/emotional dimension. Many Europeans, particularly men, die before reaching retirement age. In the European region, over 23 million years of life are lost each year because of early death from CVD [BHF 2000]. A growing elderly population living with prolonged illness places a major drain on health and social services. Currently over 27 million Europeans are living with disability and disease due to CVD. An elderly relative with a disability or impairment also places a huge emotional burden on family and carers. This is particularly the case with stroke, as many individuals survive a stroke but may be left with a physical or mental impairment.

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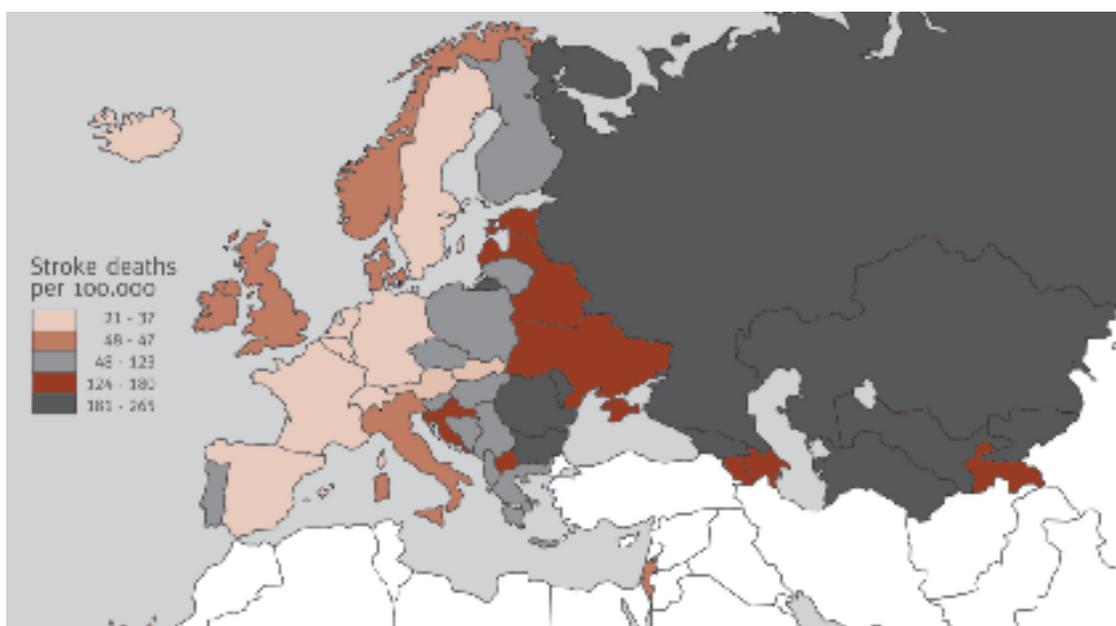
**Figure 4. Age-adjusted death rates from coronary heart disease, men aged 35-74, latest available year, Europe**



Source: Rayner, M., Petersen, S. (2000) European cardiovascular disease statistics. British Heart Foundation: London. ([www.heartstats.org](http://www.heartstats.org))

Death rates from CHD are generally higher in Northern, Central and Eastern Europe than in Southern and Western Europe. For example the death rate for men aged 35-74 living in Russia is eight times higher than in France and for women it is 12 times higher. Western European countries generally have higher rates than Southern European Countries. For example the death rate for men aged 35-74 living in Ireland is twice as high as in Italy and for women it is three times higher.

**Figure 5. Age-adjusted death rates from stroke, women aged 35-74, latest available year, Europe**



Source: Rayner, M., Petersen, S. (2000) European cardiovascular disease statistics. British Heart Foundation: London. ([www.heartstats.org](http://www.heartstats.org))

Death rates from stroke are higher in Central and Eastern Europe than in Northern, Southern and Western Europe. For example the death rate in men aged 35-74 living in Russia is nine times higher than in France and for women of the same age it is 10 times higher.

## B. Improving public health nutrition in Europe: the science

This section of this paper is based on the findings of the Eurodiet Project [Euorodiet Project 2001], although reference has been made to other key consensus documents where the Eurodiet Core Report and supporting documents did not cover an issue. It also takes account of major articles published since the completion of the Eurodiet Project.

Dietary patterns have traditionally varied considerably across Europe. While culinary and dietary diversity is to be celebrated, differences in nutritional patterns are partly responsible for the disparity in mortality and morbidity between countries and between different socio-economic groups or regions within countries. There is a creeping homogenisation of food choices across Europe. A Western-style dietary pattern high in fat and sugar and low in complex carbohydrates is spreading, accompanied by rising rates of chronic diseases.

**Human right to food for healthy life**  
Inequities are avoidable inequalities that are unfair and unjust. Under the human rights framework, governments are duty bound to uphold the right of all their citizens to the food they need for a healthy life [Leon 2001].

It is estimated that, in Europe, poor diets are responsible for about a third of cardiovascular disease (CVD) and a third of cancers [EHN 1998].

The evidence that dietary and lifestyle changes can help to prevent the progression of disease in people who already have CVD (secondary prevention) is also strong [European Atherosclerosis Society, European Society of Cardiology, European Society of Hypertension 1998]. Given that increasing numbers of Europeans are expected to live for longer with some degree of cardiac impairment, population strategies that facilitate secondary prevention will be of growing importance.

Differences in culture and socio-economic circumstances contribute to dietary diversity, but dietary patterns are strongly conditioned by the structure and content of the available food supply. National governments have a role in examining and tackling inequities in health arising from the food supply, as well as ensuring that the population has clear, accessible information about what constitutes a healthy diet. Globalisation and the shaping of the food supply by market and technology-led forces make the need for strong governance which respects, protects and facilitates citizens' human right to the food they need for a healthy life all the more important.

### Why target the whole population

Individuals suffering from CVD often have a diet and activity pattern similar to that of their disease-free neighbours. It is the interaction between environmental factors (diet and lifestyle) and the individual's susceptibility which determines the age of onset and severity of disease. Susceptibility is in turn governed by a complex array of genetic factors and other features of body size and organ function, reflecting previous stresses, illness and environmental exposures. It is the cumulative multi-factorial nature of CVD, reflecting influences of risk factors throughout a person's life-course, which makes it impossible to identify all those at risk. The effects of CVD are not confined to people in high-risk groups. The bulk of CVD morbidity and mortality exists in the normal population. This demands a public health approach that aims to protect the whole population.

### Population goals for Europe

Table 1 summarises population goals for the prevention of CVD in Europe. Table 1 is based on the recommendations of the Eurodiet Core Report which summarises figures developed on

a consensus basis by different international and national professional groups over the past two decades. The goals are fully consistent with the alleviation of all other major public health nutrition problems facing the European region today.

Whilst recommendations for the prevention of CVD have been broadly consistent for many years, it is useful to remember that an implicit part of the process of drawing up recommendations for health is weighing up the strength of the evidence compared with the potential gain or loss to public health. This ‘trading-off’ between the strength of evidence and the potential health gains/losses needs to be made clearer. Currently, few reports of expert groups systematically review the evidence using clear criteria, and the reasoning underlying recommendations is not usually made transparent. This means that recommendations are open to criticism and can be undermined by experts and interest groups that do not share the implied judgement. Equally, when the results of new research are released it can be difficult to identify how much weight to give to the new evidence. In this policy position paper, we acknowledge that for some dietary components the evidence is stronger than for others and/or the health gains are greater, and we have structured the discussion accordingly.

### **Using population goals for policy making**

Population goals are intended primarily for informing and monitoring food policy. They are not dietary guidelines for individuals. They are figures for policy makers to use and are expressed in terms which members of the public would find both difficult to understand and to relate to. This is not a weakness. Quantified population goals allow policy makers to make direct comparisons between the current dietary intake of a population and to identify the gap between the actual and the recommended dietary patterns. Armed with these figures, they can examine the implications of dietary

recommendations for food supply and production regimes and identify where changes need to take place (see Section D).

### **Summary of population goals for Europe**

The population goals are designed for the prevention of CVD in the European region, but are fully consistent with prevention of the other major public health nutrition problems facing Europe at the beginning of the third millennium. The population goals represent a recommended average intake or level. Subgroups of the population, such as infants and children, pregnant women and older people, will have different requirements.

The five goals which are supported by the strongest scientific evidence and which would give the largest public health gain are:

- a reduction in the intake of saturated fat and trans fats;
- an increase in the consumption of fruit and vegetables;
- a reduction in the intake of salt;
- an increase in physical activity levels; and
- a reduction in body mass index.

### **Using population goals for Europe at a national level**

The population goals shown in Table 1 are designed to inform policy making at European level. The national dietary pattern of countries within the European region varies, despite increasing homogenisation across the Region. Therefore, when developing national population goals the population goals in Table 1 will need to be considered in conjunction with existing national dietary patterns. Furthermore, implementation plans will need to take account of the relevant changes that can be achieved practically in a given time. The difficulty of achieving some of the goals set out in Table 1 in the short term is recognised.

**Table 1: Population goals for prevention of CVD in Europe**

Component	Population Goal*
Saturated fat	Less than 10% of energy
Trans fats	Less than 2% of energy
Fruit and vegetables	More than 400g/day
Salt	Less than 6g/day
Physical Activity Level	PAL of 1.75
Body Mass Index	BMI 23**
Total fat	Less than 30% of energy
Polyunsaturated fat	
n-6 polyunsaturated fat	4 - 8% of energy
n- 3 polyunsaturated fat	2g/day linolenic + 200mg/day very long chain fatty acids
Total carbohydrates	More than 55% of energy
Dietary fibre	More than 25g/day (or 3g/MJ)
Folate	More than 400µg/day from food
Sugary foods	4 or fewer occasions/day

Individual countries may decide to develop intermediate targets as a pragmatic approach to achieving change. However, the population goals in Table 1 offer an integrated approach to the dietary prevention of CVD across the European region and may be of particular value to those countries without current national dietary goals.

National heart foundations can play an important role in working with other key stakeholder agencies to encourage national governments to devise and implement policies and plans which will lead to step by step changes in the dietary habits of their populations. Members of the EHN can benefit by sharing their experience of activity in this area.

### How diet influences CVD risk

CVD is the result of two main processes, atherosclerosis and thrombosis. Atherosclerosis is the build-up of fatty materials within the walls of arteries, which reduces blood flow. Thrombosis is the formation of a blood clot, which becomes lodged in an artery and prevents blood from flowing. The location, extent and combination of thrombosis and atherosclerosis determine the different forms of CVD. Dietary and lifestyle factors exert their influence on CVD risk by modifying these processes in some way. For example, blood cholesterol is the major determinant of atherosclerosis. For further details, see Annex II.

Notes:

\* The population goals are expressed as a recommended maximum (less than x) or minimum (more than x), unless there is evidence that both high and low intakes are of concern; an ideal range is then given. The goals are for the average (mean) of populations, and are not for individuals. Two goals which some might expect should be included in this table are goals for dietary cholesterol and for fish. The Eurodiet Core Report did not specify goals for either of these. For the reasons for there being no goal for dietary cholesterol see Section 1.1 below. The Eurodiet Project gave no reasons for the omission of a goal for fish but note that the table does specify a goal for n-3 polyunsaturated fat – a good source of which is oily fish.

\*\* The Eurodiet Core Report specifies a population goal for BMI of 21-22 on the basis that a BMI of 21-22 is the optimum population mean BMI which both limits the likelihood of underweight and of obesity (Eurodiet Working Party 1: Final Report). However, in consultation with the Rapporteur of Eurodiet Working Party 1, Professor W.P.T. James, we have revised this goal to take into account increasing levels of overweight and obesity in Europe. A BMI of 23 lies halfway between the ideal goal of 21 and 25 (our best estimate of the mean BMI for people living in the European region).

## 1. Most important population goals: Evidence strong and public health gain large

### 1.1 Saturated fats and trans fats

**Population goal:** Less than 10% of energy from saturated fats and less than 2% of energy from trans fats

Saturated fats and trans fats are the main dietary determinants of blood cholesterol levels. In turn, blood cholesterol levels strongly influence risk of coronary heart disease (CHD). The greater the proportion of dietary energy provided in the diet from saturated fat and trans fats, the higher the level of LDL cholesterol and the greater the risk of developing CHD. Without an underlying background of elevated blood cholesterol levels, other risk factors such as high blood pressure, cigarette smoking and physical inactivity have less impact on absolute population risk of CHD. This lack of increased susceptibility produced by high blood cholesterol levels explains why countries such as Japan, where smoking rates are high, have low rates of CHD. Strategies to reduce blood cholesterol levels therefore deserve major attention.

**Saturated fats** are mainly derived from animal sources, such as meat and dairy products. Many hardened margarines and shortenings used in bakery products and processed foods also contain considerable amounts of saturated fats (as do certain vegetable oils such as coconut oil and palm oil). Dietary recommendations for CHD prevention have consistently advised reducing intakes of saturated fat, usually to less than 10% of energy. This figure is based on epidemiological evidence that there is a progressive fall in CHD mortality rates as intakes of saturated fat decline, to a threshold of below 10%. Reports on diet and cancer prevention also strongly recommend reducing animal fat consumption.

**Trans fats** are naturally present in relatively small amounts in fats (meat and milk) from ruminant animals, but the main dietary sources are margarines and shortenings used in baking products. Trans fats are formed during industrial processing when vegetable or fish oils are hydrogenated, or partially hydrogenated, to make hard or semi-solid fats. Trans fats are also formed in frying oils which are used over and over again, and there are high levels in most frying oils used in restaurants and fast food chains [American Heart Association 2000].

#### LDL and HDL cholesterol

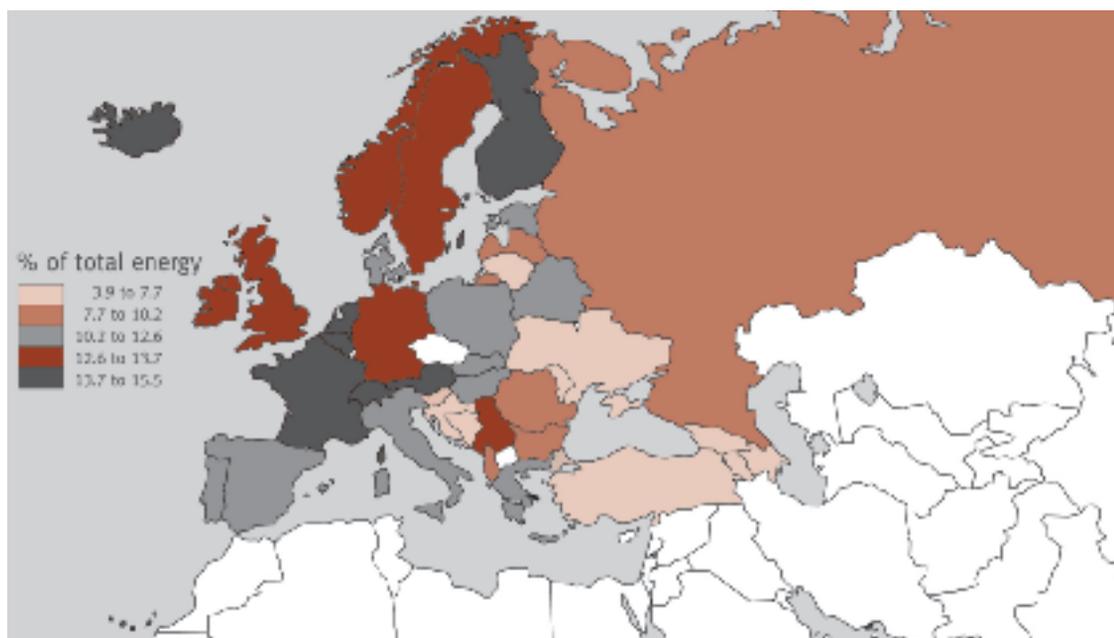
Cholesterol is carried by different lipoprotein fractions in the blood. Low density lipoprotein (LDL) carries most of the cholesterol, and is responsible for atherosclerosis. High density lipoprotein (HDL) is involved in excreting cholesterol from the body, and higher levels of HDL cholesterol are beneficial. Total cholesterol/HDL cholesterol ratio is the best predictor of CHD risk.

Biologically, trans fats seem to behave in much the same way as saturated fats. Studies have found that trans fats raise LDL cholesterol levels and also reduce levels of beneficial HDL cholesterol [Oomen et al. 2001]. It is possible that trans fats are *more* harmful than saturated fats.

#### Current intakes

No European Union (EU) Member State currently meets the population goal for saturated fat, though Portugal, Spain and Greece come close to doing so (Figure 6). Some countries in Central and Eastern Europe appear to meet the population goal, but the food supply data from which estimates of saturated fat intake have been made are not of good quality for these countries.

**Figure 6. Percentage of energy from saturated fat, 1998, Europe**



Source: A Ferro-Luzzi, National Institute for Food and Nutrition Research, Rome using data from Food and Agriculture Organisation of the United Nations ([www.fao.org](http://www.fao.org))

Saturated fat intake is higher in Northern and Western Europe than it is Southern, Central and Eastern Europe.

New processing techniques using emulsifiers have made it possible for manufacturers to produce margarines and spreads with a much lower level of trans fats, but these methods are not widely used [Gurr 2000].

## Dietary cholesterol

### No population goal

Cholesterol in the diet increases LDL cholesterol levels in the blood, but to a much lesser extent than saturated fat, and the response varies widely among individuals. Foods high in cholesterol are usually also high in saturated fat, so that reducing intakes of saturated fat, as described previously, should lead to an accompanying fall in cholesterol intakes. Although there is some evidence of a relationship between cholesterol consumption and CVD [Weggemans 2001], no population goal is included because dietary cholesterol intakes in Europe tend to be within the usual population goal of less than 300mg per day specified by expert groups and consensus documents.

## 1.2 Fruit and vegetables

### Population goal: More than 400g /day

There is a widespread consensus that diets rich in a variety of fruit and vegetables are protective against the wide range of chronic diseases affecting European society. Mortality and morbidity rates for CHD, stroke and several common cancers, including colorectal, stomach, larynx and lung cancers, are lower amongst populations eating plenty of fruit and vegetables. Fruit and vegetables can also help control diabetes, promote healthy bowel function, improve lung function and reduce risk of asthma and bronchitis, and may delay the development of cataracts. The protection appears to be dose-related; the more fruit and vegetables consumed, the better the protection. Quite small increases in fruit and vegetable consumption, for example one serving, have recently been found to be associated with significant benefits in CVD and all cause mortality [Khaw et al. 2001].

The precise reasons why diets rich in fruit and vegetables are beneficial are uncertain. Most fruits and vegetables are virtually fat-free, rich in dietary fibre and contain more than 100 beneficial compounds that may be responsible for their protective effects. These include antioxidants such as vitamins C and E, carotenoids, flavonoids, folate, potassium, magnesium, and other non-nutritive bioactive constituents, such as phytoestrogens and other phytochemicals. It appears that the protective effects of fruit and vegetables are due to the collective action of the range of compounds they contain rather than any single compound on its own. Overall, trials with high doses of dietary supplements containing these compounds, specifically vitamin E, C, beta carotene and flavonol, have not proved effective and, in the case of beta carotene, have been found to be harmful [Barton, S. (ed.) 2001].

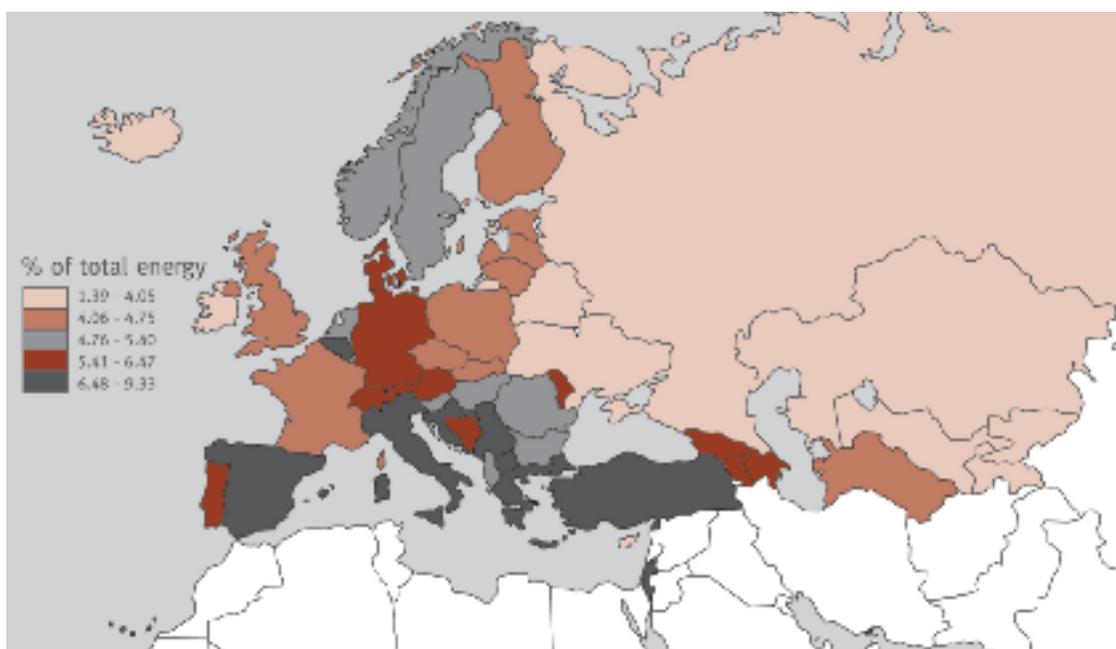
By contrast the weight of evidence from studies investigating diets rich in fruit and vegetables

### Fruit and vegetables: what these include

Fresh, frozen, dried and canned are all included. Potatoes are usually excluded because in most European diets these are consumed as starchy staples and are major sources of complex carbohydrates. Beans and pulses may be included, although in some countries these are eaten as a non-animal protein source.

indicates a positive effect. Raising intakes of fruit and vegetables can reduce blood pressure and cholesterol levels. Consumption of high levels of fruit and vegetables is accompanied by an increase in levels of beneficial compounds such as antioxidants in the blood [Hughes 2000]. European countries with higher blood antioxidant levels appear to have lower rates of CHD. Continuing investigations are required to provide clearer explanations for the observed beneficial effect of fruit and vegetables.

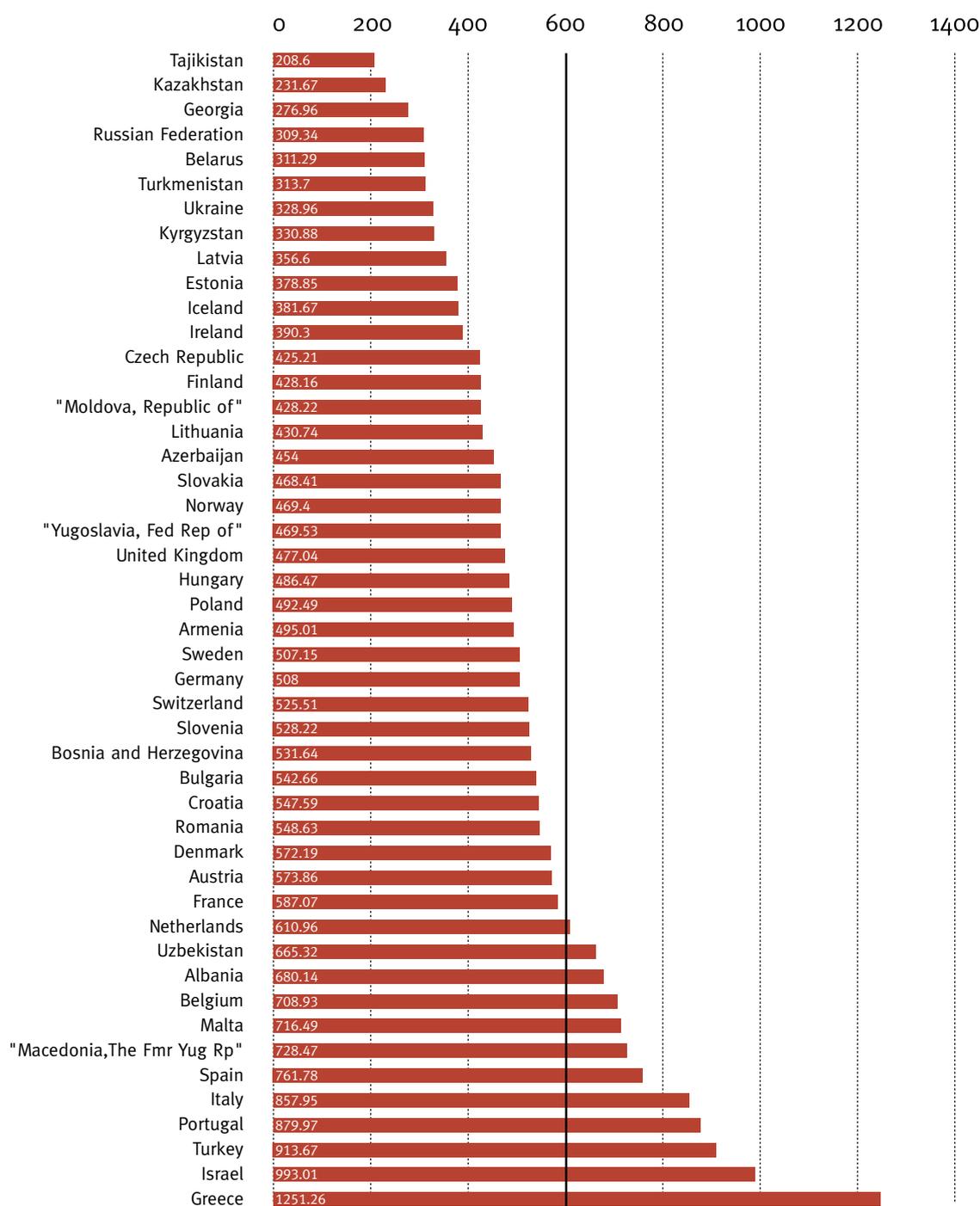
**Figure 7. Percentage of energy from fruit and vegetables, 1997, Europe**



Source: Rayner M, Petersen S (2000) European cardiovascular disease statistics. British Heart Foundation: London. ([www.heartstats.org](http://www.heartstats.org))

Fruit and vegetable intake is higher in Southern European countries than it is in Northern, Western, Central and Eastern European countries. For example people in Spain eat twice as much fruit and vegetables as in the UK and three times as much as in Kazakhstan.

**Figure 8. Availability of fruit and vegetables, 1999, Europe**



Source: Food and Agriculture Organization (2002) FAOSTAT Database. ([www.fao.org](http://www.fao.org))

Data on supply of fruit and vegetables. On average 30% is lost due to spoilage, waste or destruction. Total availability needs to be at least 600g per day to allow for an average consumption of at least 400g per day. Currently only 12 countries out of 48 in the European region have sufficient supply and availability is as low as 210g in Tajikistan.

Several international bodies have proposed an average population goal of more than 400g/day. The more than 400g/day goal would also contribute to meeting the Eurodiet Core Report's goals for folate and dietary fibre.

### Current intakes

Data on food supply suggest that in most countries in Europe supplies of fruit and vegetables are insufficient to meet the more than 400g/day population goal (Figures 7 and 8).

## 1.3 Salt

### Population goal: Less than 6g/day

Sodium intakes, principally from sodium chloride (salt), influence blood pressure and hence risk of hypertension, stroke and CHD. The association between salt intake and blood pressure is stronger in those with hypertension (high blood pressure) and in older and black individuals, who are particularly susceptible to hypertension. In Western societies, blood pressure rises with age and is an important factor in the age-related susceptibility to CVD. There is no age-related increase in blood pressure in societies with low salt intakes.

The relationship between blood pressure and risk of CVD is continuous and the definition of hypertension is rather arbitrary [European Atherosclerosis Society, European Society of Cardiology, European Society of Hypertension 1998; World Health Organization and International Society of Hypertension 1999]. The majority of CVD cases occur in individuals who do not technically have high blood pressure, but are at the higher end of the normal range. For primary prevention, lowering the average blood pressure of people with normal blood pressure as well as hypertensive individuals would be the best

strategy for lowering CVD rates. Proposals for population-wide reductions in salt intake have been controversial because of the lack of strong evidence that such an approach would significantly lower blood pressure in people without hypertension. However, recent results from the DASH II trial, one of the first salt lowering interventions to last more than a few days, are strongly supportive of a population-wide salt reduction and have led us to include salt reduction within our 'most important goals'. The DASH II trial found that reducing salt intakes led to a reduction in blood pressure of adults with normal blood pressure as well as in hypertensive individuals [Sacks et al. 2001]. The levels of salt reduction used in the DASH II trial were from 8g to 5g and 3g sodium chloride daily, and the lower the sodium intake the greater the lowering of blood pressure. The combined effect of reduced salt intakes in conjunction with a low-fat diet, high in fruit and vegetables, achieved even greater results. Dash II adds to epidemiological studies which suggest that diets low in salt and high in potassium (from fruit and vegetables) blunt the rise in blood pressure that normally occurs with age in Europe. A combination of diets rich in fruit and vegetables and low in salt offers great potential for the prevention and treatment of elevated blood pressure. Other recent studies have also supported this conclusion [Tuomilehto 2001].

### Current intakes

Many Europeans have little control over the amount of salt they consume because most of the salt in their diet is derived from manufactured foods. Non-discretionary salt accounts for 80% of salt intakes in UK and Finland, although this is lower in some countries where more home prepared foods are consumed. The increasing reliance on manufactured foods in the European diet means that action is necessary at national or regional level, involving the cooperation of food manufacturers.

## 1.4 Body Mass Index

### Population goal: BMI of 23

Obesity and being overweight increases the risk of CVD, diabetes mellitus, certain cancers, arthritis and breathing problems. Obesity is both an independent and an aggravating risk factor for CVD. It increases the impact of high blood pressure and raised blood cholesterol levels in the

**Diabetes mellitus and insulin resistance:** The development of non-insulin dependent diabetes mellitus (NIDDM) is characterised by progressive resistance to insulin-mediated uptake of glucose from the blood. Even mildly impaired glucose tolerance is associated with an increased risk of CVD. The precise mechanism of association between NIDDM and elevated CVD risk remains controversial, but chronically elevated blood glucose levels are strongly associated with a rapid acceleration of atherosclerosis.

overall risk profile. It also leads to a vastly increased risk of diabetes. The link with non-insulin dependent diabetes mellitus (NIDDM) is perhaps the most serious effect of being overweight in terms of raising CVD risk. NIDDM is accompanied by a large increase in CVD risk, and at least 80% of new cases of NIDDM can be attributed to excess weight gain.

The World Health Organization proposes a BMI range of 18.5 to 25 as a desirable individual goal for adults [WHO 2000]. The Eurodiet Core Report notes that new studies are now suggesting an optimum individual BMI of about 20. It sets a mean population goal of BMI of 21 to 22 as the optimum level to limit the likelihood of underweight and overweight. Here we suggest a European population goal of 23 based on this optimal population goal and an analysis of current levels of overweight across the European region.

### Current levels

Levels of overweight and obesity are high across the European region (Figure 9) and levels of obesity are increasing rapidly in all age groups. For example, obesity levels in adults in England have tripled in the past 20 years. Prevalence of obesity and overweight in childhood is also increasing and excess weight in later childhood tends to persist into adult life. Data from a self-reporting survey in the EU found that more than one in four adults is overweight and around one in ten is obese [British Heart Foundation 2000].

### Central or peripheral obesity

The distribution of body fat is also recognised as a risk factor for CVD independent of BMI. Central obesity where excessive fat is distributed around the abdomen ('apple shaped') confers greater risk than peripheral obesity where fat is distributed about the hips and thighs ('pear shaped'). Excess abdominal fat raises risk of high blood pressure, diabetes mellitus, and blood lipid disorders, known collectively as metabolic syndrome X. The pattern of fat deposition is largely governed by genetic factors. Overweight/obese men with a waist measurement over 94cm, and overweight/obese women over 80cm are at increased risk [WHO 2000].

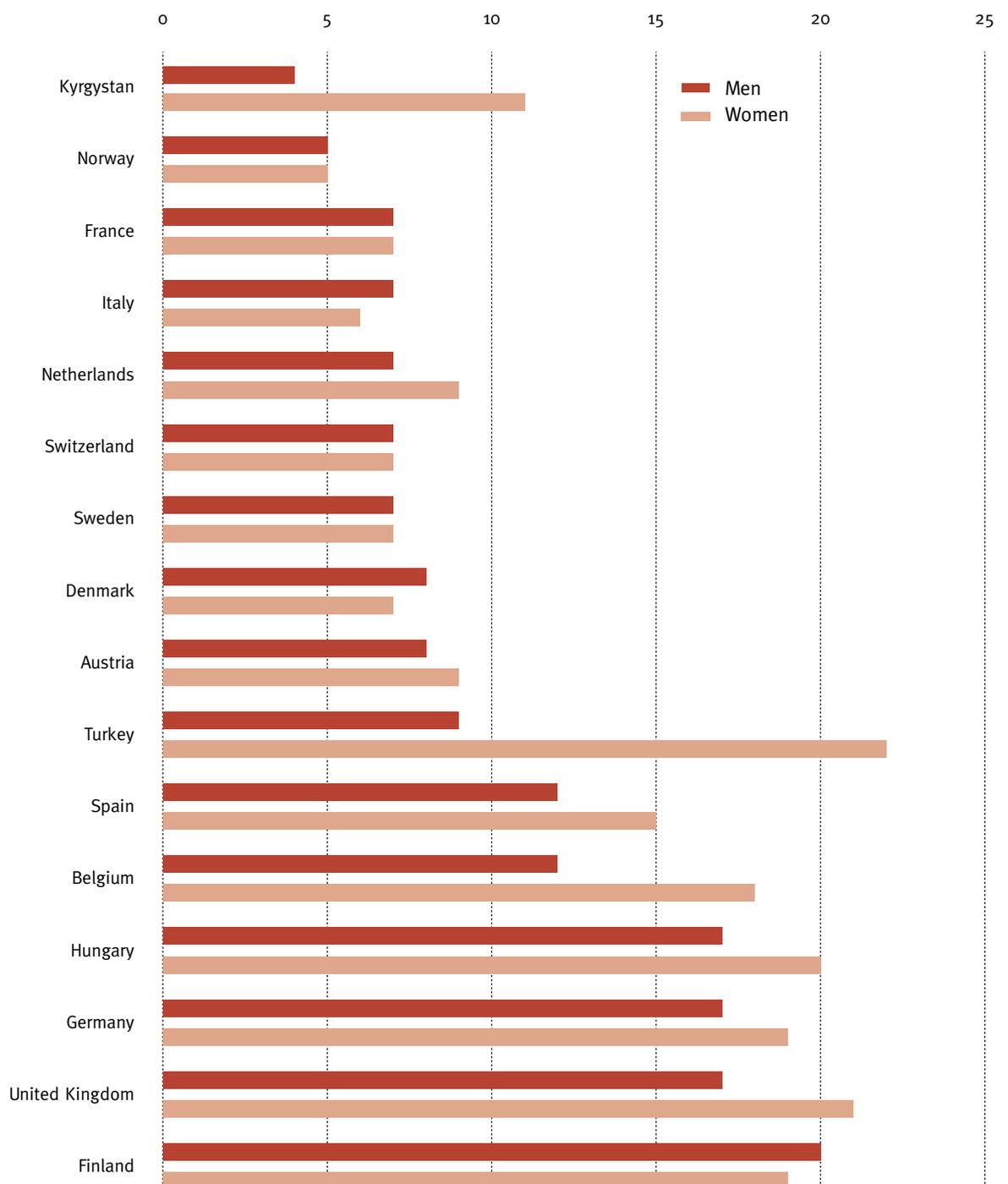
## 1.5 Physical activity

### Population goal: PAL of 1.75 (equivalent to about 60 minutes per day of moderate activity such as walking)

Physical Activity Levels (PALs) are a measure of the energy expended in physical activity, relative to the body's energy expenditure at rest. An inactive person would have a PAL of 1.4.

A lack of physical activity is associated with an increased risk of developing CVD, high blood pressure, some cancers, osteoporosis and arthritis. Physical activity is beneficial because it lowers heart rate, blood pressure, blood triglycerides and

**Figure 9. Prevalence of obesity, latest available data, Europe**



Source: Petersen, S., Rayner, M. (2002) Coronary heart disease statistics. British Heart Foundation: London. ([www.heartstats.org](http://www.heartstats.org))  
 Levels of obesity (a BMI > 30) are now high and increasing in most European countries.

the tendency of blood to clot. At the same time physical activity raises levels of HDL cholesterol, improves insulin sensitivity and has an influence on psychological well-being. A sedentary lifestyle more than doubles the risk of CVD [EHN 1999].

Research examining the association between weight gain and physical activity suggests that where populations have a PAL below 1.75, weight gain on typical European diets is inevitable. Thus a population goal of a PAL of 1.75 is required in order to prevent weight gain in countries where the population consumes diets relatively high in fat (as in the majority of European countries).

A PAL of 1.75 could be achieved by prolonged periods of moderate activity, for example walking for an hour each day or combining walking with other moderate activity choices such as gardening. A PAL of 1.75 could also be achieved by shorter, more intense bursts of vigorous activity, for example, jogging for 30 minutes each day. For most individuals a combination of short periods of intensive activity coupled with prolonged periods of moderate activity probably represents the most feasible way of raising PALs.

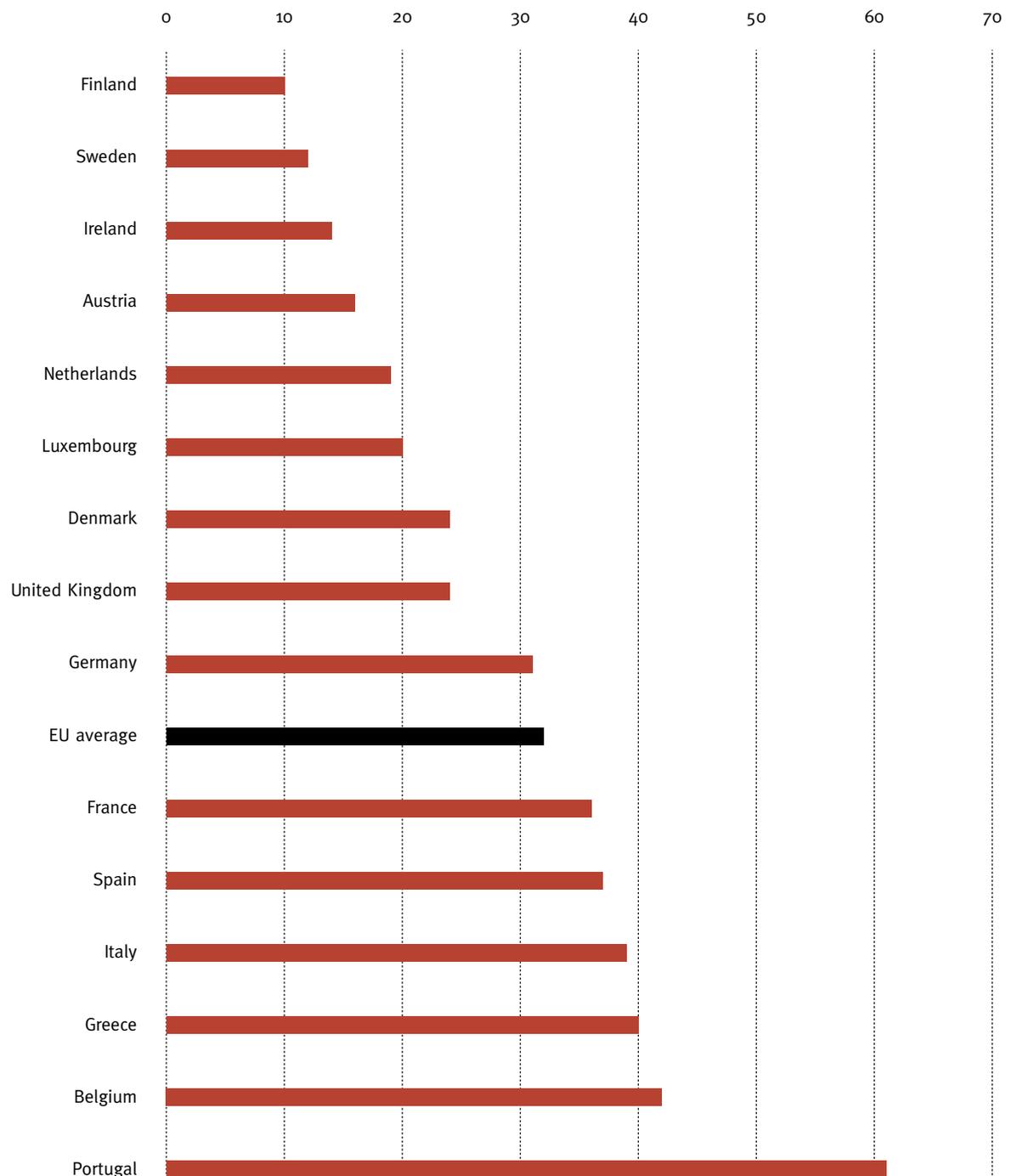
Raising physical activity levels is one of the most important European goals for public health because it has such a strong effect on CVD risk and because activity levels in the European population are so low. Inadequate physical

activity is more prevalent in populations than any of the classic risk factors for chronic diseases, (smoking, hypertension, raised blood cholesterol and overweight). The proportion of CVD incidences that could theoretically be prevented if the European population were more physically active – the population attributable risk – is estimated to be around 30-40% [EHN 1999].

### **Current levels**

Europe's population is becoming increasingly sedentary with physical inactivity becoming the norm for children and adults. It is estimated that the majority of people in the EU are physically active for less than 30 minutes a day, and around 30% of adults do no physical activity in a typical week (Figure 10). A typical European adult whose lifestyle involves only light occupational and leisure-time activity is likely to have a PAL of around 1.55. Increasing activity to achieve the population goal of an average PAL of 1.75 represents a significant challenge for many populations in the European region. For heart health, every European adult should aim to accumulate at least 30 minutes of moderate intensity physical activity most days and preferably every day of the week [EHN 1999].

**Figure 10. Percentage of adults aged 15 and over who do no physical activity in a typical week (equivalent to a PAL of 1.4), European Union countries**



Rayner M, Petersen S (2000) European cardiovascular disease statistics. British Heart Foundation: London. ([www.heartstats.org](http://www.heartstats.org))

The prevalence of physical inactivity in EU countries is high with on average 32% of adults carrying out no leisure-time physical activity in a typical week.

## 2. Evidence moderate and public health gain moderate

### 2.1 Polyunsaturated fat

**Population goal: n-6 polyunsaturated fat: 4 – 8% energy; n-3 polyunsaturated fat: 2g/day of linolenic and 200mg/day of very long chain fatty acids**

Replacing saturated fat with unsaturated fats (whether mono- or polyunsaturated) leads to a reduction in LDL cholesterol levels. There is also increasing evidence that n-3 polyunsaturated fats are beneficial for heart health. N-3 polyunsaturated fats include alpha-linolenic acid (from rapeseed and soya oils) as well as the fatty acids found in oily fish and fish oils, whose benefits have long been established. N-3 polyunsaturated fats have anti-thrombogenic and anti-inflammatory effects, lower blood pressure and triglycerides levels and can reduce the risk of sudden death, arrhythmia and recurrent heart attacks [American Heart Association 2000].

Current intakes of n-3 polyunsaturated fats, which are generally low, should be increased. This may mean that previous advice emphasising the value of types of oil rich in n-6 polyunsaturated fat (such as sunflower, maize, and peanut oils) will need to be modified to encourage the use of foods high in n-6 and n-3 polyunsaturated fats in place of saturated fat sources.

### 2.2 Total fat

**Population goal: Less than 30% of energy**

Fat is the most energy dense of nutrients, supplying 38kJ per gram compared with 17kJ per gram of carbohydrate or protein. There is robust

evidence that an energy-dense, high-fat diet is an independent risk factor for weight gain and obesity. The obesity-promoting effect of a high-fat diet is enhanced in sedentary individuals, because physical activity levels alter the way dietary fat is utilised and stored in the body. People with a familial or genetic predisposition to obesity are especially vulnerable.

The population goal of less than 30% of energy from dietary fat is based on the need to reduce the energy density of European diets for the primary prevention of obesity. Some argue that because the population is so sedentary, the goal should be as low as 20-25% of energy. However, such diets tend to lower HDL cholesterol levels. Higher fat intakes, for example, 35% of energy, can be compatible with health, but only if high levels of physical activity are sustained throughout life.

Previous evidence of an epidemiological association between total fat intakes and CHD mortality have largely been attributed to accompanying high intakes of saturated fat. Where total fat intakes are high, but intakes of saturated fats are low, for example as they used to be in Greece, CHD rates were generally low. Studies comparing the effects of reducing total fat with replacing saturated fats with unsaturated fats at constant fat intake indicate that the most benefit is gained from a shift away from saturated fats to unsaturated fats.

### 3. Evidence weaker and/or public health gain smaller

#### 3.1 Dietary fibre and complex carbohydrates

**Population goal: More than 25g/day (or 3g /MJ) of dietary fibre and more than 55% of energy from complex carbohydrates**

Complex carbohydrates come from plant-based starchy foods such as bread, potatoes, pasta and rice. There is no evidence that high intakes of complex carbohydrates *per se* have any influence on CVD risk. Rather, they generally occur in low-fat foods which are suitable for making up the bulk of a lower-fat diet. They also tend to have a low glycaemic index, and poor glucose control promotes atherosclerosis.

Dietary fibre is the largely undigested component of plant-based foods that improves intestinal and bowel function. High-fibre diets reduce constipation, haemorrhoids and diverticulosis, and are linked to the prevention and management of weight gain, obesity and diabetes and the prevention of certain cancers. This effect is thought to be due to decreasing intestinal transit time, increased satiety and decreased hunger. Insoluble fibre, which is mainly derived from grain products, is responsible for stool bulking. Soluble fibres found in fruits, vegetables, certain cereals (oats) and particularly pulses (beans, lentils) affect intestinal function and metabolism. Previously it was suggested that soluble fibres such as beta-glucans in oat bran lowered serum cholesterol. Now this effect is mainly attributed to the displacement of high-fat foods.

The population goals for dietary fibre and complex carbohydrates can be achieved by consuming a diet rich in fruit, vegetables, pulses, potatoes and whole grain cereals.

#### 3.2 Folate from food

**Population goal: More than 400 µg/day**

Intakes of folate across Europe are generally low and there are concerns that intakes are unlikely to be meeting nutritional requirements. Folate deficiency can induce anaemia and neural tube defects in babies born to deficient mothers. Dietary folates are only 50% bioavailable, so supplements are usually recommended for women who may become pregnant and who are in the early stages of pregnancy, for the prevention of neural tube defects.

There is a suggestion that folates may also help protect against CVD, by lowering levels of an artery-damaging compound, homocysteine, in the blood (see glossary), but a firm conclusion about this awaits the results of several intervention studies that are currently underway. As yet there is insufficient evidence to justify recommending folate supplements or fortification of foods with folate for CVD prevention in the whole population. Increasing consumption of fruit, vegetables, pulses and whole grain cereals in accordance with the other population goals should improve population intakes.

## 4. Goals indirectly related to CVD prevention

### 4.1 Sugary foods

**Population goal:** Four or fewer occasions per day for prevention of dental caries (an occasion includes any episode of food and drink consumption in the day)

Consensus documents on diet and health recommend reducing sugar intakes. There is no evidence that sucrose is causally related to the development of CVD. However, sugary foods tend to be energy dense, and it is sensible to limit sugar intakes to address the major problem of rising obesity rates in Europe, although there is debate as to whether obesity is enhanced by consumption of fatty energy providing foods or just by an overload of calories, independent of the source (fat or sugar). The Eurodiet Core Report population goal for prevention of dental caries, used here, is based on studies showing that eating sugary foods more than four times a day is associated with a marked increase in caries. This accords well with goals of less than 10% of energy used in other reports. Reducing sugary food consumption to four occasions daily represents a huge departure from current eating habits where sugary foods are consumed with most of the three main meals, in addition to several snacks or drinks throughout the day.

## 5. No Goal

### 5.1 Anti-oxidant vitamins A, C and E, and minerals potassium and calcium

There is currently no clear evidence to support the use of dietary supplements or fortification to raise intakes of vitamins or minerals for CVD prevention. Although antioxidant vitamins may be partly responsible for some of the protective effects of fruit and vegetables, there is insufficient evidence that the use of antioxidant vitamins alone may be beneficial. Similarly, dietary potassium, which is principally derived from fruits and vegetables, may reduce blood pressure and risk of stroke, but the evidence is weak. The suggestion that higher calcium intakes may be responsible for the lower CHD rates in hard water areas, because calcium may reduce the absorption of saturated fat, is not yet proven.

### 5.2 Alcohol

There is some evidence that moderate alcohol consumption may lower risk of CHD (in middle-aged and older men and in post-menopausal women). However, consumption of more than two drinks<sup>2</sup> of alcohol per day for men and one for women increases risk of high blood pressure, strokes and certain cancers. Alcohol consumption is also known to aggravate hypertriglyceridemia. For those that choose to consume, consumption should be moderate. Recommendations vary between no more than one to three drinks a day for women (and no more than 14 drinks per week) and no more two to four drinks a day for

men (and no more than 21 drinks per week) [American Heart Association 2000]. It is also advisable to abstain from drinking alcohol on some days in the week. Women are advised to drink less than men because of their greater metabolic and toxicological sensitivity.

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<sup>2</sup> One drink of alcohol equals half a pint of ordinary beer or a small glass of wine or a pub measure of spirits.

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## C. Dietary versus pharmacological strategies

The population dietary goals advocated by Eurodiet Core Report are based on a public-health approach to the reduction of chronic disease. They invite strategies which are accessible to everyone, in keeping with government's responsibility to ensure that the population has access to the foods needed for a healthy life, irrespective of what individuals ultimately choose to eat. However, this is not the only approach available. In recent years there has been a growing interest in semi-medical or pharmacological approaches through the use of dietary supplements and 'functional foods' (foods modified with the purpose of having specific disease-preventing or health-promoting effects beyond basic nutrition). Several compounds, such as plant sterols, have been identified which achieve reductions in blood cholesterol levels that could offer an important new option for those people with markedly raised blood cholesterol levels. However, from a policy perspective, the question remains whether manipulation of food ingredients in this way is a useful approach for cardiovascular disease (CVD) prevention in the whole population.

Firstly, there are concerns about efficacy and safety. Medicines have to undergo stringent testing for efficacy and safety before manufacturers can apply for a licence, and once licensed, medicines are distributed under strictly controlled conditions, through medical practitioners or pharmacists. Functional foods and dietary supplements are regulated as foods, and therefore can evade rigorous testing requirements and be sold on the open market. However, some manufacturers of functional foods have chosen to submit their products for approval under the European Union's Novel Food Regulations, which do judge on safety issues. In many cases, evidence for the beneficial effects of functional foods is from fairly short-term trials under controlled dietary conditions and performed on selected

study groups. Whether the functional food is effective in the normal range of food choices of free-living individuals, and whether users consume the quantity required to achieve a beneficial effect, may be less clear.

Secondly, there is concern about the use of a pharmacological approach to remedy what is essentially a problem of poor diet. Although manufacturers of functional food products generally recommend their use alongside a healthy diet and lifestyle, there are concerns that individuals will simply use these products in addition to consuming foods high in saturated fat, sodium, etc. In addition, functional food products might also displace their 'normal' counterpart from the diet without offering any benefit and possibly with an adverse effect.

**Soya protein:** There is some evidence that soya protein can reduce LDL cholesterol levels, especially in those with high cholesterol levels. Soya contains a group of isoflavones that have weak estrogenic activity and these may be responsible. It is too early to make general recommendations about inclusion of soya products in the diet, and caution is required as isoflavones are removed during processing of some commercial soya products.

**Plant sterols:** Plant sterols, (extracted from soya bean and wood pulp) appear to compete with cholesterol for absorption and thereby reduce the amount of cholesterol absorbed. However, there is some concern that plant sterols may also decrease plasma levels of beta carotene, vitamin E and lycopene. Until further long-term studies can ensure the absence of adverse effects, the use of these products should be reserved for adults with markedly raised cholesterol levels.

[American Heart Association 2000]

Thirdly, there is the question of equality of access. Will the supplements or functional foods be available to the population groups that need them most? Will they be affordable, available and socially and culturally appropriate? If not, supplements and functional foods may serve to increase inequities in public health by offering quick-fix solutions to those that can afford them and taking the pressure off governments for making structural changes to the food supply that might otherwise benefit everyone.

Overall, it is important to remember that the dietary strategies outlined in public health reports such as this one present eating patterns which have been found to be beneficial to health and prevent a whole range of chronic diseases affecting European society. Supplements and functional foods tend to address specific aspects of individual diseases but might not improve health overall. For example, plant sterols reduce cholesterol levels and potentially can reduce risk of heart disease, especially for those at increased risk, but their long-term, possibly adverse, effects on health overall are unknown. At individual and population level, protection against the whole range of chronic diseases offers the best promise.

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## D. Improving public health in Europe: the policy implications of the science

It is clear from the developments at the World Health Organization (WHO) and European Union (EU) level described in the Introduction that there is an opportunity for nutrition to have a new priority on the public health agenda (see also Annex I). The implementation of the WHO Food and Nutrition Action Plan and the EU's expected nutrition action plan will place all governments in Europe under some pressure to demonstrate that they are taking effective action to improve nutrition.

In 2002, the WHO will publish a major analysis of the Global Burden of Disease. It is already clear that cardiovascular disease (CVD) is likely to be the biggest burden on the health of the world's population and that it is likely to stay top of the list until at least 2020. Governments will be asked what they are doing to tackle CVD.

National heart foundations across Europe are in a good position to help their governments prepare for these questions. The following section describes how each country can assess its current situation and identify the areas where change would have a significant impact. This section also highlights successful examples where improvements have been made in the nutrition and heart health of the populations.

### **Policies which may have an impact on nutrition**

When the links between diet and disease were first identified, it was thought that widespread dietary change would be achieved by educating people about what constituted a healthy diet or an unhealthy diet. Although people do need to know about healthy nutrition, it is now known that the reasons why humans eat what they eat are complex.

There has been a significant shift in thinking, and it is now well recognised that many different policies at the local, national and international level have an impact on what we eat and have the potential to help promote or prevent CVD. It is also recognised that many existing policies may have negative effects on nutrition. This is because the drive behind food policy has often been to increase agricultural production and to promote national self-sufficiency in food and agricultural produce. The EU Common Agricultural Policy (CAP), for example, was designed to increase the quantity of agricultural production in a post-World War II context. This resulted in huge increases in milk and meat consumption throughout the Union. Those European countries currently in economic transition, in Central and Eastern Europe, can learn from the mistakes made in Western Europe during the 1940s and 1950s.

The huge influence of the CAP on food and agriculture throughout Europe, within and outside the EU, can limit the capacity of national governments to promote dietary change in their own countries.

Any policy that has an impact on the type of food produced (by farmers, by food manufacturers or by caterers) has the potential to affect diet-related disease. Examples of such policies include production incentives and subsidies, food compositional standards, and school and workplace nutrition standards.

Similarly, policies that influence the types and quantities of food consumed by Europe's citizens can have a health impact. Policies in this category include food labelling legislation, rules on advertising and promotion of food products, pricing policies, retailing strategies which affect the availability of foods, and education relating to food and nutrition.

In addition to policies which have an impact on food produced and food consumed, a whole range of policies affecting, for example, physical activity patterns, poverty and social inequalities, can have an impact on public health nutrition.

### **What is the scope for improving nutrition in your country?**

The first stage is to investigate the current nutritional situation and identify the barriers which prevent nutritional improvement and the opportunities for promoting dietary change.

A framework has been developed to help identify the specific needs and problems in your country. Researchers in New Zealand and Australia have devised the ANGELO (Analysis Grid for Environments Linked to Obesity) framework for analysing and understanding how different aspects of the environment contribute to the obesity pandemic [Swinburn, Egger and Raza 1999]. This basic framework is a 2 x 4 grid which dissects the environment into environmental size (micro and macro) on one axis. On the other axis, four important types of environmental factors are identified: physical, economic, political, and socio-cultural.

The micro-environment settings which might be relevant include homes, workplaces, schools, colleges and universities, community groups, churches, hospitals, supermarkets, restaurants, cafés and other catering outlets, sports and recreation facilities, transport and healthcare settings. The macro-environmental settings affect a larger number of people and often operate at the regional, national or international levels. These settings, which include food manufacturers, food retail chains and catering services, urban or rural development organisations, the health system and the media, are more difficult to influence.

Swinburn et al. piloted this framework on the island communities of the Torres Strait Islands, where over half the population is classified as overweight or obese. Some of the factors which were identified as important using the framework were: the availability of cars, cost of reduced-fat foods, the quality of imported foods, traditions related to festival eating, elders as role models, and cultural values placed on sport. Other factors which were identified as important, but were judged difficult to modify, were the low cost of fatty meat, the relatively easy access to loans for cars, and the financial incentives for exporting locally-caught fish rather than selling them on the local market. Projects that were identified as priorities as a result of the analysis included providing safe walking paths, increasing the availability of local food and promoting of traditional activities such as dancing. Figure 1 illustrates the outcome of this analysis.

This framework could be used to identify the problems and opportunities relating to nutritional risk factors for CVD. Many of the elements will be similar to those identified for the obesity analysis. The micro and macro environments identified above would be appropriate.

## Projects identified as priorities by ANGELO framework analysis of obesity in Pacific Island Communities

SIZE	TYPE			
	Physical	Economic	Political	Socio-cultural
<b>Micro (settings)</b>				
Festivities				Cultural importance of high-fat foods
Neighbourhoods	Recreation and sports facilities Safe walking paths			
Schools	Canteens serving local food		Policies on physical education Promotion of traditional activities, e.g. dancing	
Homes	Home gardens			
Churches				Church leaders as role models
Markets	Availability of local food			
<b>MACRO (sectors)</b>				
Transport	Availability of buses and bus stops			
Health regulatory system			Policies and standards on imported food quality/labelling	

[Swinburn, Egger and Raza 1999]

This kind of systematic analysis needs to be applied to each of the key priorities in relation to CVD. In Section B these were identified as being:

- a reduction in the intake of saturated fat and trans fats;
- an increase in the consumption of fruit and vegetables;
- a reduction in the intake of salt;
- an increase in physical activity levels; and
- a reduction in body mass index.

For each of these key issues, the analytical framework could be used to assess the factors which contribute to the current situation and the opportunities for change. This would mean identifying the relevant macro and micro settings that might have an impact on each of these priorities. The relevant elements of the physical, economic, political and socio-cultural environments then need to be identified. This would mean asking the following questions:

### **What is available to the population (physical environment)?**

Which foods provide a high proportion of the saturated fat or trans fats consumed? What quantities and types of fruits and vegetables are available? Which foods provide the most salt? What is available at the micro level in different food outlets – supermarkets, restaurants, schools, vending machines? Similarly, the influences on the availability of different foods at the macro level – such as national or EU policies which influence the types and amounts of food produced – need to be identified.

### **What are the economic factors relating to food consumption?**

Which policies influence the price that consumers pay for products? Tax, pricing policies, producer subsidies and retailer competition can all have an influence. As well as policies influencing food prices, factors affecting the income of the population and the individual are important.

### **What rules and regulations are relevant?**

Aspects of the political environment including rules, regulations and policies can also be important environmental factors. Examples include school nutrition policies at the level of the micro-environment and legislation governing food labelling, compositional standards for foods and food advertising at the macro-environment level.

### **What socio-cultural factors are important?**

The attitudes and beliefs related to food within a community can influence consumption. At the individual level, beliefs and attitudes may be influenced by the culture or the ethos in the home, school or workplace. At the macro-environment level, the mass media play an important role in shaping attitudes.

A systematic analysis of the nutritional situation using a framework such as the ANGELO framework can be carried out at different levels. The more detailed and more specific the analysis is, the more practical and concrete the options identified will be.

At a very general level, the questions outlined above could be applied to 'saturated fat intakes'. This would identify major food sources of saturated fat in the diet such as meat, milk and hydrogenated vegetable oils. The same framework could then be applied at a more detailed level to identify more specific opportunities for change. Identifying the factors which promote saturated fat intakes through meat consumption, for example, is possible (see the box on the left).

Alternatively, the analysis could focus on the options for reducing saturated fat consumption at the micro-setting level. One example could be to identify the factors which promote saturated fat consumption in schools and identify the

#### **BOX 1. Reducing the fat content of chips from fast food outlets**

The ANGELO framework described earlier in this section was applied to fast food outlets in New Zealand to identify means of reducing the fat content of chips (french fries). It was calculated that a one percentage point drop in the average fat content of chips would result in a fall in the average fat intake per person of about 333g of fat per year. Analysis with the ANGELO framework considered factors such as the type of frying fat used, the profit margins on thin versus thick chips and the difference in fat uptake between chips cooked from frozen or from raw. This analysis, when combined with a national survey of deep-frying practices and research on the fat content of chips produced by different methods, identified several potential improvements. These include training programmes, best-practice guidelines for deep-frying and the promotion of larger chip sizes.

[Swinburn, Egger and Raza 1999]

## BOX 2. Identifying some options for reducing saturated fat consumption

Where does the saturated fat in the diet come from? The answer to this question will vary from one European country to another, but the main contributors are likely to be: meat, milk, vegetable oils (which naturally contain saturated fat) and hydrogenated oils.

**Milk fat:** To reduce the contribution of dairy fat to saturated fat consumption, we need to know in what form the milk fat is being consumed. In many countries there has been an increase in the consumption of skimmed milk. This milk fat has, however, been diverted into the food chain. What foods are the main contributors of dairy fat to the diet? Which current policies have an impact on milk fat consumption and what are the policy options for change? Options to explore include:

- support for farmers who want to change their production methods to ensure a reduced supply of dairy fat;
- research into cattle breeds that produce milk with lower fat content and into cattle feeding practices which reduce fat levels and alter the fat profile of milk;
- find alternative non-food uses for butterfat and introduce incentives.

**Meat:** Once again the main sources of fat from meat need to be identified on a country by country basis. It is known that some countries have reduced their intake of saturated fat from meat by, for example, reducing consumption of preserved meat products. As with dairy fat, there is a need to engage the agricultural sector and promote change. There is a need to shift the whole agricultural focus of Europe away from meat production. Policy options could include:

- incentives to encourage the rearing of lower fat animals and animals with less saturated fat;
- reducing financial support for the promotion of meat and meat products (in the EU, this amounted to 10 million euros for beef /veal in 1998);
- research into the optimal farming conditions for lower-fat breeds of animal;
- regulating the use of fat removed from the carcass during meat preparation and finding non-food uses for this fat (e.g. rendering into cosmetics and candles) which will in turn reduce the market drive to produce animal fat.

**Vegetable oils:** Saturated fats are found naturally in some vegetable oils and are also present in oils which have been hydrogenated by the food industry. The policy options for these two types of oils differ. Strategies to reduce consumption of vegetable oils should target the agricultural production or importation of these oils. Policies to reduce consumption of hydrogenated oils require direct engagement with the food manufacturing industry and catering services.

possibilities for change. Box 1 describes how the ANGELO framework was applied to reducing the fat content of chips in fast food outlets.

Having identified a comprehensive list of factors which are potentially important, the next stage is to assess the relative importance of the factors along with an assessment of whether it is possible to modify each factor. It is clear that international trade policy and bodies such as the EU and the World Trade Organization play an important role. Although national governments can have some influence over the development of these bodies and their policies, there is a limit to the capacity for changing these factors at the national level. They are unlikely, therefore, to feature as priorities for national action.

Once the relevant factors have been ranked in terms of priority, the possibilities for research and for intervention can be identified and, in turn, prioritised.

Box 2 illustrates some of the factors which could be identified as options to reduce consumption of saturated fat at the national level. Clearly, this analysis will be different for other nutritional priorities, such as fruit and vegetables, and the saturated fat case study is only meant to serve as an example.

It is a daunting prospect for any national government or any national heart foundation to undertake an analysis of the whole nutrition situation. This exercise should involve people from all sectors including agriculture, food manufacturing, health services, schools and education authorities, caterers, the media and government.

It is clear that not all the answers to all the questions will be available in the beginning. This should not be a cause for dismay and should, instead, be useful in identifying important research priorities if the nutritional health of the population is to be improved in the long term.

The impact of a comprehensive food and nutrition policy needs to be monitored and evaluated. This follows on from the original investigation into the current trends. Monitoring is an essential part of the process and is vital to maintaining broad cross-sectoral support for change.

### **It can work**

We have known for some time that policy intervention can work in practice, because there have been some examples of successful policy initiatives to promote healthy diets and/or prevent disease. Box 3 below describes one of the most notable success stories – Finland, where the country's position at the bottom of Europe's league table for CVD in the 1970s inspired a comprehensive and dynamic response to improve the country's heart health.

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### BOX 3. Finland - the North Karelia example

Perhaps the most famous example of a successful initiative to reduce cardiovascular mortality and morbidity is that of Finland, where awareness of high rates of coronary heart disease (CHD) mortality in the 1960s led to the conception of a community-based programme to prevent CHD. The North Karelia Project, in East Finland, was initiated in 1972 following a community petition to demand government funding to tackle the problem.

The North Karelia programme was devised as a comprehensive intervention involving all sectors of the community, notably citizens themselves. The central task of the programme was to 'shift the risk factor profile' of the community. The initial risk factors selected for attention were smoking, hypercholesterolemia and hypertension. Nutrition was seen as an important aspect of lifestyle to address within the programme. The North Karelia diet was traditionally very high in dairy fats and salt and very low in vegetable consumption.

As the programme evolved there were four main areas of activity:

- media - mass media activities aimed at enhancing knowledge and understanding about healthy lifestyles;
- health service activities - training of health professionals;
- community-organised activities;
- environmental and policy activities – this included collaboration with food manufacturers and caterers and retailers.

A whole host of nutrition-related strategies were implemented to achieve these changes. These strategies have involved a wide range of players, including health care professionals and the food and catering industries. Relevant actions include:

- dietary guidelines for meals served in schools, hospitals and the workplace;
- liberalisation of regulations on dietary fats which made it possible to combine dairy and vegetable sources of fat and to produce low-fat spreads;
- introduction of new food labelling rules to highlight the proportions of different types of fat;
- rules on the maximum salt concentration for foods such as soups and sauces, and a requirement for 'heavily salted' labels on products such as butter, sausages, bread and breakfast cereals where the sodium content was above a particular level;
- provision of free salads as an accompaniment to meals in the catering sector;
- working with livestock breeders to change the quality of meat produced – replacing fatty pork and beef with lean pork;
- a collaborative project – the Berry Project – to promote the consumption of local berries (and to promote berries as an alternative crop to farmers).

The results of the North Karelia Project have been impressive. The project did have a significant effect on risk factors and the dietary changes were substantial. Between 1972 and 1992 serum total cholesterol fell by 13% in men and 18% in women and use of saturated fats declined by a third.

CHD mortality rates have fallen dramatically from the rates which prevailed before the programme was introduced. By 1992, CHD mortality had fallen by 59%, and by 1994 this fall had reached 65%. CHD mortality fell more in North Karelia in the 1970s than in the other area of Finland used as a reference, although the rest of Finland has now caught up with North Karelia. It has been estimated that the lower mortality between 1970 and 1992 prevented around 3,800 deaths in people aged under 75 in North Karelia and 50,000 deaths in all of Finland.

[Puska et al. 1995]

## E. EHN Recommendations for improving public health nutrition in Europe

There are several lessons which can be learnt from the North Karelia example and other success stories. The following section describes these lessons and how they should be applied at the national level and at the European level.

**Central recommendation: A comprehensive, integrated food and nutrition policy, which involves all relevant sectors, is required to promote heart-healthy nutrition.**

The main message of the North Karelia experience other successful examples, such as Norway (see Box 1), is the need for an integrated food and nutrition policy. The development and implementation of such policies is a major commitment, whether it is at international, national or local level, and requires a serious investment in time.

To implement an integrated food and nutrition policy at the national level, Member States need to conduct an enquiry into current trends as illustrated above for saturated fat for each of the key areas. In doing this, and in engaging with a wide range of sectors and enlisting high-level political support, the possible actions can be identified.

The review of current scientific thinking on nutrition and cardiovascular diseases (CVD), described in Section B, has identified four areas that are likely to be priorities for any national strategy in Europe. These are:

- **saturated fat and trans fats** – population goal of less than 10% of energy from saturated fat and less than 2% of energy from trans fats. Policy needs to be directed towards changing the composition of fats in the food chain from saturated fat and trans fats to mono and polyunsaturated fats;

- **fruit and vegetables** – population goal of more than 400g/day. Policy needs to be directed towards increasing the supply of, and access to, fruit and vegetables and to reducing their price;
- **salt** – population goal of less than 6g/day. Many Europeans have little control over the amount of salt they consume because most of the salt in their diet derives from manufactured foods. Policy needs to be directed towards a blanket reduction in salt in manufactured foods, and action is necessary at a national or regional level to obtain the cooperation of manufacturers; and
- **Body Mass Index** – population goal of a body mass index of 23 and **Physical Activity Level** – population goal of a PAL of 1.75. Policy needs to be directed towards providing opportunities for incorporating physical activity into the daily lives of Europeans in order to achieve a lowering of BMI.

At the World Health Organization (WHO) level, a comprehensive food and nutrition policy is taking shape through the recent adoption of the Food and Nutrition Action Plan. The World Health Organization's Regional Office for Europe (WHO EURO) has a crucial role to play in supporting and facilitating the actions of member states, particularly those European countries on the outside of the powerful EU block and the Central and Eastern European countries which are still undergoing economic development/transition.

For the EU, the Commission has, as described earlier, promised to introduce a comprehensive nutrition policy. An Action Plan for the implementation of this policy was issued for consultation in April 2001. It is essential that this Action Plan take account of the impact of various EU policies on nutrition and introduce real and significant changes to these areas of EU policy. EU policies which affect the consumption of saturated fat,

## BOX 1. Norwegian Food Policy

Interest in food and nutrition policy in Norway goes back to the 1930s, initially as a result of concern about the food supply if war were to break out in Europe. Mortality from coronary heart disease (CHD) had increased dramatically between 1900 and 1945 and by 1946 a National Nutrition Council was established with a remit to create a food and nutrition policy that the government and parliament could adopt.

The food and nutrition policy evolved over the years and three white papers – in 1976, 1982 and 1993 – defined the policy goals at each stage and the measures to be implemented to achieve these goals. The food and nutrition policy adopted in Norway was epidemiologically based. That is, decisions relating to the strategy to improve nutrition were based on knowledge from monitoring and research into consumption patterns and disease patterns. The main sources of fat in 1975 were dairy products, margarine and meat.

The principle behind the policy – as well as being knowledge-based – has been that although 'it will remain entirely an individual decision what to eat, it is a public and community responsibility to ensure that circumstances are as good as possible to enable the individual to choose a nutritionally favourable diet.' In order to achieve this, the policy combined legal, economic, organisational and educational measures. For example, the Norwegian government encouraged farmers to increase production of grains for human consumption, potatoes, vegetables and low-fat milk. Measures were introduced to avoid overproduction of meat and the production of grass-fed, rather than grain-fed, beef and less-fatty pork were encouraged.

The main changes in Norwegian nutrition between 1975 and 1993 have been a reduction in fat consumption, mainly due to a reduction in saturated fat intakes, and an increase in consumption of fruit, vegetables and cereals. These changes are reflected in a fall of about 10% in the average blood cholesterol levels and a large reduction in CHD mortality in middle-aged men and women.

A notable feature of the Norwegian approach is the early recognition that a successful policy to improve nutrition must be multisectoral and involve people across a very broad range of sectors. In addition to being multisectoral, nutrition policy should be well integrated into health policy and other policy areas. Although there was initially conflict between the policy makers and sectors of the food industry, there is now good collaboration.

One of the key reasons that the food and nutrition policy appears to have been successful in reducing CHD mortality in Norway is the fact that it was backed by the National Nutrition Council. The Council has played an important role in developing and implementing the policy. The Council in its current form is a body of independent experts with knowledge in the areas of nutrition biology, clinical nutrition, community nutrition, public health, sport medicine and physical activity, epidemiology and nutrition policy. Most of the experts are professors at Norwegian universities.

The Council advises Ministers, non-governmental organizations and the food industry on nutritional issues; describes and evaluates the Norwegian situation in respect of nutrition and physical activity; proposes new strategies and measures to improve nutrition and increase physical activity; helps coordinate professional work on nutrition; and is actively involved in education about nutrition and physical activity. It is also charged with formulating Norwegian dietary guidelines.

After the first White Paper in 1976, an Inter-Ministerial Coordinating Committee on Nutrition was set-up to coordinate all political sectors involved in nutrition policy. This body never worked as planned, however, and its existence prevented the National Nutrition Council from having any real political influence. As a result of the Inter-Ministerial Coordinating Committee's inactivity, however, the National Nutrition Council became more involved in liaison with politicians and gradually gained power and influence – factors which have contributed to its success.

[Johansson et al. 1997, Norum et al., 1997]

trans fats salt and fruit and vegetables, as well as those which affect bodyweight and physical activity, need to be identified.

It is also important that the EU recognise its role in assisting Member States to implement an effective nutrition policy. Provision of excellent, consistent scientific advice which Member States can use in developing their own policy responses is one way in which the EU can support its members.

**Recommendation: New structures, which involve senior policy makers, are required to implement the comprehensive food and nutrition policy.**

In order to develop and implement an effective nutrition policy, a proper support structure will be needed. Implementation of an integrated plan, which threads through many areas of policy, will require close collaboration and improved coordination. In addition, an independent group is required to identify the options which would be most effective in public health terms, and this group should be free of interference from vested interests.

At the national level, a high-level policy group is needed. Box 4 describes the example of the National Nutrition Council in Norway, which was highly effective, as an appropriate model.

Within the EU, improved mechanisms to coordinate the efforts of different parts of the Commission, and other relevant players, to improve nutrition are required. A nutrition taskforce, within the Commission, to improve coordination is needed.

**Recommendation: Political commitment to improving nutrition should be sustained by publishing a regular report on the state of nutritional health.**

There are a number of barriers to progress that routinely undermine efforts to improve nutrition and promote health including: conflicts of interest, prolonged research rather than decisive action due to a very high burden of proof to justify public health measures, and lack of involvement from health professionals. It is important to be aware of these factors, which have impeded progress in many countries in the past. Key factors in overcoming these barriers are:

- **Maintaining political commitment.**

The commitment to taking action on public health nutrition which has been demonstrated in Europe in the last two years should not be wasted. In order to sustain efforts to promote nutrition and prevent CVD, it is essential to maintain the political will to take action in this field. The introduction of a follow-up mechanism, requiring the periodic production of a report on the progress relating to nutritional health, is one way to maintain political drive.

- **Building a cross-sectoral alliance.**

Involving a wide range of stakeholders and building a broad alliance, as happened in Norway and Finland, will help to maintain momentum and overcome the barriers described above. Building public support for actions to improve the nation's nutrition is important for encouraging all other sectors to become involved and be seen to contribute to these efforts.

## References

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## Conclusion

To date, very few resources have been allocated to preventing chronic diseases compared with the vast expenditure on treating them. Primary prevention does work. Meta analyses of dietary interventions in free living individuals show modest improvements in diet and biological risk factors – but if these changes occur across whole population impressive improvements can be achieved. Between 1972 and 1992 in Finland a 13% decrease in serum cholesterol, and a 9% decrease in blood pressure were achieved, accounting for a large part of a 60% decline in CHD mortality. If a whole society changes diet and lifestyle patterns, the new way of healthy living becomes socially acceptable.

Primary prevention is a long term strategy, but the potential gain – not least a longer disease-free life – is considerable, and the sooner initiatives are started, the sooner they will yield results. Public health strategies are based on enabling people to make healthy choices. A lack of a public health strategy means that people have little choice but to eat processed foods high in saturated fat and salt, or drive to the shops to obtain healthier foods because they are located out of town.

For many years there has been considerable consensus amongst the scientific and public health community on the dietary and lifestyle pattern which can reduce CVD, cancer and other major causes of ill health in Europe. The challenge is to develop and integrate agricultural, food, nutrition and economic policies for Europe which put the health of European consumers at the fore.

# Annex I

## Initiatives on nutrition and health in the European Union

Early attempts to promote action on nutrition at the EU level were not very successful. In December 1990, there was a Council resolution noting the importance of nutrition as a determinant of health, which invited the Commission to present a programme on nutrition.<sup>3</sup> Specifically, the Council suggested that this programme should include a Year of Nutrition, some general awareness-raising activities, some pilot projects on nutrition, and research into nutrition and health, and called for the Scientific Committee for Food to give a more prominent role to nutrition. The Commission did not produce any programme on nutrition following this Resolution, choosing instead to incorporate nutritional components into the health promotion and health monitoring programmes and a campaign against cancer.

Many aspects of the overall environment for public health policy in Europe have changed since 1990, when the earlier Council Resolution on nutrition appeared to have minimal impact. Crucially, the Treaty of Amsterdam increased the scope for Community action in the field of public health and recognised that many different areas of EU policy can have an impact, often unforeseen, on health. Article 152 of the Treaty states that 'a high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities'.

There have also been major structural changes in the organisation of public health within the Commission. In fact, there have been two major reorganisations of the Commission, both of

which had a major impact on public health and consumer protection, since 1990. There was a major reorganisation of the Commission in 1998 with a focus on consumer health and food safety following the Boven Spongiform Encephalopathy (BSE) crisis. A further reorganisation took place in 2000, following the earlier resignation of the whole Commission, which saw nutrition and food safety both coming under the umbrella of the new Health and Consumer Protection Directorate-General (DG SANCO).

In 1998, the European Heart Network proposed eight practical strategies for achieving dietary recommendations for CVD prevention in the EU.<sup>4</sup> These recommendations were:

- develop a food and nutrition policy for Europe;
- specifically include nutrition within the responsibilities of DGXXIV and ensure greater coordination between DGV and DGXXIV on nutrition issues;
- establish a European Nutrition Committee within DGXXIV;
- improve mechanisms for auditing the impact of EU policies on the health and nutrition of EU consumers;
- make provision through the CAP for the promotion of healthy food choices;
- take more account of nutrition considerations in EU legislation on food labelling and advertising;
- propose EU Directives on the use of health and nutrition claims; and
- promote a unified approach to the promotion of healthy living in Europe.

<sup>3</sup> Commission of the European Community. Resolution of the Council of 3 December 1990 concerning a community action on nutrition and health. *Official Journal*, C329 31/12/90, 1990.

<sup>4</sup> European Heart Network. *Food, Nutrition and Cardiovascular Disease Prevention in the European Union*. EHN, Brussels, 1998.

There now appears to be increasing recognition that there is a need for action on nutrition at the EU level. Many existing decisions and policies at the EU level already have an impact on food consumption and on nutrition. Examples include legislation on food quality, agricultural produce pricing policies, the management of surpluses, rules on food labelling, and the education of health professionals. There has also been an awakening to the potential for the EU to support the Member States in promoting healthy nutrition.

The new awakening to the significance of healthy nutrition has not been limited to within the EU. The World Health Organization Regional Office for Europe (WHO EURO) undertook a major initiative to develop a food and nutrition policy document and action plan for the European region, which includes more than 50 countries, for the period 2000-2005. In September 2000, the Regional Committee for Europe adopted a resolution which endorsed the Action Plan and recommended that member states take steps to carry out the Plan.<sup>5</sup>

One sign of an increased commitment to nutrition within the EU context was the Commission's January 2000 publication of the White Paper on Food Safety.<sup>6</sup> This document, although largely concerned with food safety issues, did contain several commitments relating to nutrition, including presentation of an action plan and the development of '*a comprehensive and cohesive nutritional policy*'. More specifically, the White Paper referred to the development of Council Recommendations for dietary guidelines,

establishment of appropriate information tools, promotion of nutritional research, and inclusion of nutritional factors in Community data collection systems. The inclusion of these nutrition actions in the White Paper were surprising to many given the extreme sensitivity of the Commission to food safety matters at that time following the furore over BSE.

Another key issue also signalled in the White Paper on Food Safety was the intention to establish a European Food Authority. This led to the establishment of the European Food Safety Authority in January 2002. Included in the EFSA's remit<sup>7</sup> are the following provisions on nutrition:

**Article 22: The mission of the EFSA shall also include: scientific advice and scientific and technical support on human nutrition in relation to Community legislation and, at the request of the Commission, assistance concerning communication within the framework of the Community health programme.**

**Article 28: The following scientific panels shall be set up: the Panel on dietetic products, nutrition and allergies.**

**Article 33: The EFSA shall search for, collect, collate, analyse and summarise relevant scientific and technical data in the fields within its mission. This shall involve in particular the collection of data relating to: food consumption and the exposure of individuals to risks related to the consumption of food.**

<sup>5</sup> World Health Organization Regional Office for Europe. WHO First Action Plan for Food and Nutrition Policy for the WHO European Region 2000-2005. WHO, Copenhagen, 2000. ([www.who.dk/eprise/main/WHO/Progs/NUT/FoodandNutActPlan/20010906\\_2](http://www.who.dk/eprise/main/WHO/Progs/NUT/FoodandNutActPlan/20010906_2))

<sup>6</sup> Commission of the European Community. White Paper on Food Safety. COM(1999) 719 final, 2000.

<sup>7</sup> Regulation 178/2002/EC of the European Parliament and of the Council laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

Meanwhile throughout 2000, further developments continued to push nutrition on the EU agenda, and in December the Council adopted a Resolution on Health and Nutrition.<sup>8</sup> The Resolution asserted the importance of nutrition for health and invited Member States and the Commission to take action to promote better nutrition.

The Resolution invited Member States to:

- promote healthy attitudes and provide information for informed choice;
- involve a wide range of parties in the promotion of nutritional health;
- draw up and implement dietary guidelines;
- improve the nutritional knowledge of health professionals;
- participate in the networks collecting data on nutrition and physical activity; and
- encourage national experts to participate in Community activities and in the production of scientific evidence.

The Resolution also invited the Commission to:

- allow for nutritional health to be taken into account when drawing up and implementing any relevant Community policies and develop tools for assessing the health impact of Community policies;
- continue to develop tools for monitoring nutritional health and its determinants and work with Member States on this issue;
- support and promote regular exchanges of experience;
- facilitate the development of scientific evidence in the area of nutritional health to provide backing for and to update national or local dietary guidelines and consumer information;

- facilitate the exchange of information on nutrition-related training courses and professions;
- adapt nutritional labelling to the needs of consumers and develop other means of providing nutritional information;
- consider conducting projects to promote healthy diets (in relation, for example, to increasing fruit and vegetable consumption and promoting breast feeding);
- consider the use of new information technologies to improve access to information for professionals and the public; and
- plan follow-up to nutrition activities.

The Commission noted the Council's invitations and has replied that it will 'examine their feasibility in the context of preparing the action plan on nutrition policy announced in the White Paper on Food Safety'. Speaking at the European Congress on Public Health the day after the Resolution was adopted, Commissioner Byrne stated that his Directorate would endeavour to produce a nutrition action plan within the term of the Swedish presidency of the EU, that is within the first half of 2001.

The adoption of the Council Resolution represented the culmination of the French government's push to promote nutrition as a priority theme of its Presidency of the EU in the second half of 2000. The work of the French Presidency expert group,<sup>9</sup> which included a representative from each Member State, drew heavily on the work of the EU-funded Project. For the Eurodiet Project, four expert working groups examined:

- the relationships between health and nutrients;

<sup>8</sup> Commission of the European Community. Resolution of the Council of 14 December 2000 on Health and Nutrition. *Official Journal* C20/1 23/1/2001.

<sup>9</sup> Société Française de Santé Publique. *Health and Human Nutrition: Elements for European Action*. SFSP: Nancy, 2000.

- how to translate nutrient targets into meaningful dietary advice (based on foods rather than nutrients);
- effective ways to encourage healthy nutrition and physical activity; and
- barriers and opportunities for promoting healthy nutrition in the European policy context.

Following on from these analyses, Eurodiet experts were able to identify population goals for nutrients, some foods, and other lifestyle features for the prevention of major public health problems in Europe. The proposed population goals cover physical activity, body mass index, dietary fat, types of fat, carbohydrates, consumption of sugary foods, fruit and vegetables, folate from food, dietary fibre, sodium, iodine and breast feeding.

The report of the French Presidency called on the Commission to adopt these agreed population goals as an EU Recommendation on dietary guidelines (which was promised in the White Paper on Food Safety). Working towards the population goals in such a recommendation, Member States could then develop their own dietary guidelines to take into account their current national situation and dietary differences.

Other key issues highlighted by the Eurodiet Core Report and the French Presidency include:

**Health impact assessment** – both reports called for evaluation of the potential and actual impact of any relevant EU policy on nutritional health. The December 2000 Council Resolution invites the Commission to carry out these assessments and to develop the necessary tools to do so. The main policy areas which are likely to be relevant include agriculture, health, taxation, internal

market, consumer affairs, social policy, education, environment, customs, industry, and transport.

**Coordination and follow-up mechanisms** – Both reports called for structural changes to implement and monitor an action plan on nutrition and, in particular, improve coordination of different activities. The French Presidency report suggested creation of a nutrition health task force to coordinate activities, encourage exchange and support the process of health impact assessment. This task force would be supported by a nutrition forum to bring together the principal players, and a special Ministerial debate on nutritional health policy every four years. The Eurodiet Core Report recommended creation of a new EU Standing Committee on Nutrition to give scientific and policy advice, oversee the evolution of population dietary goals, and coordinate the monitoring of nutrition, diet and lifestyles. The report suggested that this committee could be supported by a strengthened nutrition unit within DG SANCO. Both groups called for periodic publication of a report on the state of nutritional health in Europe, preferably every four years.

**Consumer information and protection** – The EU has an important role in regulating much of the nutrition and health information provided to consumers (nutrition labelling, nutrition and health claims) and supporting Member States, efforts to provide clear and comprehensive dietary information to their populations. The Commission also harmonises rules on food fortification, food supplements and purity criteria. Various gaps in the current legislation have been identified, and better regulation, particularly on labelling, is essential to enable Europe's consumers to choose a healthy diet.

**The promotion of breast feeding** – Both the Eurodiet Core Report and the French initiative highlighted breast feeding as an area where the EU should attach priority to reviewing the current situation across the EU and assessing, and if necessary improving, the effectiveness of relevant EU legislation, such as the regulations on breast milk substitutes.

**The increased consumption of fruit and vegetables** – The promotion of fruit and vegetable consumption, which is recognised as a policy that is widely supported by public health nutritionists and would also be supported by producers, should be a key component of any EU Food and Nutrition Policy. The French Presidency report calls for a study to examine the options for promoting fruit and vegetable consumption through the range of EU policies.

Since the publication of the Eurodiet Core Report and the French Presidency report, the subsequent adoption of the Resolution in December 2000 and Commissioner Byrne's commitment to try to produce some follow-up before the end of June 2001, an inter-Directorate General working group of the Commission has been working towards the Action Plan on Nutrition. To this end, a status report on the European Commission's work in relation to nutrition is expected to be published in the second quarter of 2002. It will lay the groundwork for the Action Plan.

## Annex II

### Glossary

**LDL and HDL cholesterol:** Cholesterol is carried by different lipoprotein fractions in the blood. Low density lipoprotein (LDL) carries most of the cholesterol, and is responsible for atherosclerosis. High density lipoprotein (HDL) is involved in excreting cholesterol from the body and higher levels of HDL cholesterol are beneficial. Total cholesterol/HDL cholesterol ratio is the best predictor of CHD risk.

**Lipid peroxidation:** There is some evidence that the accumulation of LDL cholesterol during atherosclerosis is enhanced if the LDL has been oxidised. The lipid peroxidation theory suggests that oxidation of LDL may be encouraged by low antioxidant status, for example, due to poor nutritional intake.

**Homocysteine:** Homocysteine is an amino acid produced by the breakdown of methionine in the body. High plasma levels of homocysteine are associated with increased risk of CHD and stroke. There is a suggestion that homocysteine may damage the inner lining of arteries, encouraging atherosclerosis and blood clots; however, a direct causal link has not been established. Vitamin B6, folic acid and B12 are all involved in the removal of homocysteine.

**Blood pressure:** Blood pressure is determined by the combined force of the heartbeat, the internal diameter of the arteries and the resistance or elasticity of the arterial walls. High blood pressure means that the heart has to work harder pumping blood around the body, and the high pressure can damage the inner lining of the arteries.

**Thrombogenic mechanisms:** The readiness of blood to clot is determined by the concentration and activity of factors involved in the thrombogenic mechanism, such as fibrinogen and Factor VII, and the stickiness of blood.

**Diabetes mellitus and insulin resistance:** The development of non-insulin dependent diabetes mellitus (NIDDM) is characterised by progressive resistance to insulin-mediated uptake of glucose from the blood. Even mildly impaired glucose tolerance is associated with an increased risk of CVD. The precise mechanism of association between NIDDM and elevated CVD risk remains controversial, but chronically elevated blood glucose levels are strongly associated with a rapid acceleration of atherosclerosis.

**Saturated, monounsaturated, polyunsaturated fat:** Dietary fats are made up of three types of fat: saturated, monounsaturated and polyunsaturated. The classification is based on the number of unsaturated carbon-carbon double bonds in the fatty acid. Within each type, there are a range of fatty acids of different carbon chain length. The main saturated fatty acids in the diet are stearic (18:0), palmitic (16:0), myristic (14:0) and lauric (12:0) fatty acids. Myristic and palmitic are the most potent elevators of cholesterol, while stearic and shorter chain length fatty acids (10 or less) have no cholesterol raising effect.

**Trans fats:** Trans-unsaturated fatty acids are mono- or polyunsaturated fatty acids whose molecular structure has been twisted from a *cis* to a *trans* form. The change in structure changes their biological properties.

**Polyunsaturated fat:** There are two main families of polyunsaturated fat; the n-6 group found mainly in seed oils (sunflower, maize, soya and peanut oils) and the n-3 group found mainly in fish oils, vegetables and a few seed oils (rapeseed and soya). Both n-3 and n-6 fatty acids are involved in the synthesis of prostaglandins (or eicosanoids) which are potent mediators of physiological processes. For example, prostaglandins influence blood clotting, vascular dilation, immune responses and inflammatory reactions. N-3 and n-6 fatty acids compete for the same enzyme system producing prostaglandins, so that providing too much of one can upset the balance of synthesis.

**Monounsaturated fat:** Monosaturated fatty acids make up the most common class of fatty acid in the diet because they are present in varying proportions in most fats and oils. The main monounsaturated fatty acid is oleic acid (18:1) which is found in large quantities in olive oil.

**Essential fatty acids:** Two polyunsaturated fatty acids, linoleic acid (LA, n-6) and alpha-linolenic (ALA, n-3), are essential fatty acids; they cannot be synthesized by the body and there is a physiological requirement for them to be supplied by the diet, in the same way as for vitamins and minerals. Other fatty acids in the n-6 and n-3 series can be synthesized from these basic building blocks, including Arachadonic acid (AA, n-6), Docosahexanoic acid(DHA, n-3) and Eicosapentenoic acid (EPA, n-3).

**Body Mass Index (BMI):** BMI is an index of body fatness and is calculated by weight (kg) divided by height (m)<sup>2</sup>.

**Physical Activity Level (PAL):** PAL is the ratio of total daily energy expenditure to basal metabolic rate. A PAL of 1.4 would involve no physical activity and energy requirements would simply be those to satisfy those of basal metabolic rate (body's energy requirements while resting).



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