

Keynote addresses

Nutrition and diet for healthy lifestyles in Europe: science and policy implications

Matti Rajala*

Directorate General for Health and Consumer Protection (Unit F/3), European Commission, Bâtiment Euroforum – L-2920 Luxembourg

Keywords

European Commission,
Eurodiet, Policy

First let me thank Professor Kafatos and his team for organizing this important conference and bringing us here to the lovely island of Crete. Second, I am pleased to inform you that the European Commission is launching today a proposal for a new health program of the community. One of the main planks of this proposal tackles health determinants.

I trust that it is not necessary for me to convince this audience that nutrition is a major determinant for health. That is to say that some elements of our nutrition are beneficial for our health and some other elements may be detrimental. All this sounds straightforward and simple. However, I have learned during the course of the EURODIET Project that the question is not at all either simple or straightforward.

The core policy question to answer in this context is: How can we enable the people to enjoy healthy nutrition, and thus promote and protect their health. Evidence from Member States with active nutrition policies show that clear and convincing basic messages form an irreplaceable foundation for that strategy.

There are strong cultural and regional differences in diets and also differences in how the science is interpreted. Considering these differences, is it feasible to aim at European action in this field? I believe that it is indeed feasible. It is already evident that although the differences are there they are diminishing. European travel and increasing food availability are contributing to our societies becoming more multicultural also with regard to nutrition and diet. It is also quite clear that the cultures are not carved in stone but they are dynamic. If the messages differ substantially or in the worst case are controversial, the outcome is that the people do not know what to do. Such a

situation, instead of enabling healthy choices, would make peoples' lives more complicated.

Nutrition and diet is not only a matter of informed choices at the level of an individual. Increasingly people eat out e.g. in restaurants, and in the canteens of the workplaces and schools. There the choices have already made regarding the nutritional contents of the available food. The same applies to certain extent also to the food we prepare at home.

We depend on what the agriculture and food industries through the retail system make available for us. Of course supply and demand depend on each other but it would be too simple to think that this mechanism could not be influenced. I am absolutely sure that the producers and the industry are willing to develop healthier alternatives for the consumers.

Here it is possible to create win-win situations, where the interests of health promotion and the interests of producers and industry can meet in synergy.

Let me come back to the question of messages, which I said should be understandable and clear. These messages stem from the scientific knowledge, or at least should stem from science. The problem with this requirement is the always-developing nature of the scientific knowledge. Science also has an in-built quality of questioning everything that has been said. We must of course accept these facts but at the same time we must be able to define what is our current understanding. That is to say, what is our best knowledge today on nutrition and health? This must be based on the bulk of the evidence and the scientific discussion on it; i.e. in the context of a systematic review of the total accumulated scientific knowledge of the respective field.

When we talk about food, we also have to keep in mind the safety aspect. I am not going to enter the traditional food safety domain, but would like to bridge the food safety and healthy nutrition areas. In

* Correspondence: Email Matti.Rajala@cec.eu.int

our advice to people the issues of safe storage, handling and preparing of food form an essential part. On the other hand in the healthy nutrition advice we always must also analyze if our advice and recommendations entail risks for the population as a whole or to certain groups of it. The basic minimum requirement is that advice should not harm. This means that if we would like to recommend that people change the intake of a given component of their diet, at the same time we have to carefully check if this recommendation implies any risks. On the other hand, and especially if no risk is involved, careful consideration is also called for if and how controversial scientific findings should be taken into account when formulating recommendations.

I believe it is also fair to say here that the policy makers expect from the scientific community clear positions on main nutritional issues such as carbohydrates, proteins, fat, salt, fruit and vegetables, and energy-intake, just to mention some.

The EURODIET project, which is part of Health Promotion Implementation, is a scientific project, and we are here primarily to validate the current

state of this project. This nature, science-based, should be kept in mind during the conference. It is, however, also obvious that the policy line that may follow one day in this process, will not only build on the science of healthy nutrition but will also take into account other relevant factors, such as the capabilities of the production sector and industry.

This conference is of utmost importance. I am certain that the outcomes will be fruitful for the nutrition policy of Europe. I would also like to take the opportunity to thank the French government, which, in a very dynamic way, is playing a major role in this field. The French Presidency in the Council starting in July 2000 is putting healthy nutrition high on the political agenda. The European Commission has already done so as you have certainly observed when reading the recent White Paper on Food Safety, and also by giving nutrition a high priority in the implementation of current public health programmes, Health Promotion, Health Monitoring and also Cancer Programme. I am confident that nutrition will continue to be a major priority in the Commission's future public health programs.

The dietary challenge for the European Union

W P T James

Public Health Policy Group and International Obesity Task Force (IOTF), 231 North Gower St., London NW1 2NS, UK

This conference comes at a very appropriate time: the EU Commission has just published its White Paper on the formation of a Food Safety Authority; DG SANCO is being reorganised to accommodate public health issues; the EU French Presidency is proposing an EU initiative on nutrition and health and the European Region of WHO will be embarking in the near future on a new set of analyses and policies for diet-related diseases.

Nutritional deficiencies

Traditionally Europeans have considered the problems of nutrition as those of deficiency diseases - and deficiencies do still give grounds for concern within the EU. The classic problems of iodine deficiency disorders and iron deficiency anaemia remain unsolved in many countries, despite our understanding of how to prevent these problems. At present only in Finland, Sweden and the UK are iodine intakes adequate; a discernible goitre from inadequate iodine intakes continues to affect appreciable numbers of people in France, Germany and Italy, where there are no established national iodination policies¹. The International Council for Control of Iodine Deficiency Disorders (ICCIDD), the non-governmental organisation involved in combating iodine deficiency, has classified the European region as the most backward in the recent remarkably successful global drive to introduce routine iodization policies. The problem of iron deficiency is also surprisingly prevalent in Europe with up to 10% of girls and women suffering from iron deficiency anaemia and with perhaps a third of children, adults and the elderly having subclinical iron deficiency, i.e. with no measurable iron stores for mobilising iron, should the need arise. To these classic deficiency problems we must now add new evidence relating to folic acid deficiency if this is judged in biochemical terms². This deficiency, now proven to be significant in determining the development of neural tube defects in the early stages of pregnancy³, is linked to the risk of having a small baby with all the short-

and long-term handicaps that this entails, and the deficiency is now also being linked to the risk of both coronary heart disease and strokes. Thus folic acid deficiency may prove to be a substantial public health problem in the European population. Vitamin D deficiency has long been known to be a common problem in Asian immigrants to Europe and to threaten those in the more Northern regions of Europe where the benefits of sunlight in summer are too short-lived, e.g. in the UK and Scandinavia. However, recently, vitamin D deficiency has also been found to be a particular problem in the elderly population throughout Europe; surprisingly, the elderly living in the Mediterranean region are particularly deficient, presumably because despite current recommendations, they do not stay outside with their skins exposed to catch the irradiation needed to stimulate the synthesis of vitamin D within the skin. Their fat intake is also based predominantly on unfortified olive oil so they do not have the benefit of the additional vitamin D which is a required addition to some fats and oils in many Northern member state regulations.

These examples accord with the classic concepts of deficiency which are readily accepted by the general public. The subtlety of iron deficiency, which is particularly evident in a subgroup of women with a strong familial and, indeed, genetically determined high menstrual loss, is also easily understood. More complex is the possibility that some aspects of health are related to modest intakes of vitamins and minerals which do not lead to clear cut evidence of a classic deficiency disease such as scurvy. Thus it has been shown that vitamin C intakes may need to be 100 mg/day to limit the emergence of abnormal oxidised DNA in the genome and this damage may well serve as a marker of cumulative life-long damage. Other subtle deficiencies may become apparent as we learn more, e.g. whether selenium deficiency, as yet poorly defined, is involved in promoting the development of some cancers. Similarly a complex of antioxidant vitamins and

*Correspondence: Email jeanhjames@aol.com

other biologically active compounds found in vegetables and fruits may well play a role in limiting arterial damage.

These examples are an extension to the classic picture of deficiencies which were well described during the first half of the 20th century. The second half of the century, however, saw a very different set of nutritional principles emerging of even greater public health significance. The idea that the steadily escalating problems of so-called adult chronic disease, i.e. coronary heart disease, stroke, high blood pressure, diabetes mellitus, gallstones, many intestinal diseases and some cancers, might not only have a nutritional component but be essentially caused by dietary imbalances, is still difficult for some scientists and policy-makers to fathom. A vivid illustration of the importance of this concept is, however, shown by the benefits which are evident when action is taken to improve the diet. Pre-war studies in the UK and America had shown the value of meat and milk in promoting children's growth in height and in limiting the development of iron deficiency; milk consumption was also thought to promote bone growth. Thus meat and milk production and consumption became European and American priorities for agriculture, health and social policies. Special grants were made to farmers and there was a major investment in research on animal production. The eventual establishment of the Common Agricultural Policy within the European Community was initiated to protect the livelihood of farmers but also served to promote the supposedly best practice in agriculture with ample meat and milk production. Thus, after the Second World War, public health policy was geared to the provision of enough high quality food to guarantee the absence of deficiencies so that children would grow well with nobody going hungry. Yet while children's growth improved, new disease patterns emerged with the chronic adult diseases, noted above, becoming epidemic.

The post-war emergence of chronic diet-related diseases in adults

As the national changes in diet took hold during the 1950s, the new diseases became apparent. Angina and coronary heart disease, rare clinical conditions for doctors' training in the 1930s, soon took on epidemic proportions in Northern Europe. However, Keys from Minnesota in the US, fresh from his meticulous and now classic studies on semi-starvation in young conscientious objectors⁴ embarked on a study in seven countries across the globe to work out why CHD was so unusual in Japan, Crete and Corfu, Yugoslavia and Italy but a scourge in Finland, the Netherlands and the United States⁵. This remarkable cross-cultural

epidemiological study revealed that CHD rates could be predicted from the level of serum cholesterol in a population's adults. Hitherto serum cholesterol was only used as a general marker of malnutrition! Keys and his colleagues linked these findings with dietary studies on animals fed high animal fat diets which induced vascular damage. New volunteer feeding studies on the impact of different saturated fatty acids from animal fats showed that these fatty acids had selective effects in increasing blood cholesterol levels but polyunsaturated fatty acids suppressed these elevated blood cholesterol levels. Keys' physiological studies revealed starkly how some individuals were very sensitive to changes in dietary saturated fat whereas others were almost unresponsive for reasons we now know to be genetically based. Keys also highlighted the importance of the three risk factors - smoking, high blood pressure and high serum cholesterol levels - in promoting CHD but recognized that Japanese men, with the highest blood pressure levels in the world and also higher smoking rates, had the lowest cholesterol levels and the lowest CHD rates. Thus smoking and blood pressure were additional amplifiers of risk, whereas the dietary factors leading to blood cholesterol increases were fundamental to the development of CHD. Overweight and obesity were not predictors of CHD and it was the saturated fat, not the total fat, intake which was important. By the early 1960s Keys was already promulgating this analysis which was then crudely explained as cholesterol accumulating in the vessel wall to occlude the blood flow to the heart.

The American Heart Association soon took on these concepts but in Europe change came more slowly with the exceptions of Norway and then of other Scandinavian countries, particularly Finland. In Norway a series of moves by academics established a politically effective National Nutrition Council⁶ which led to a transformation of the health services: tuberculosis clinics were converted into cardiovascular monitoring centres and there were major national campaigns to reduce saturated fat intake and enhance vegetable and fruit consumption. Agricultural priorities were also changed with pricing policies developed to ensure that vegetables and fruit were delivered to the most northern towns and villages throughout the year at the same price as those found in Oslo. This sustained national effort led to a major reduction in the incidence of CHD which was particularly evident in the younger age groups. It is also noteworthy that these campaigns and policies were aimed at everybody and not simply at a subgroup of citizens who were found to have high cholesterol levels. In fact it was soon evident

that the average blood cholesterol of Scandinavians was so high that if a Japanese man were found to have such a level, there would be immediate concern that he had some rare genetic abnormality! Thus the successful population approach in public policy-making was initiated before there had been any of the modern validating mathematical analyses of the burden of disease and the fraction of that burden which could be attributed to diet and how population rather than high risk strategies would maximise the national benefit.

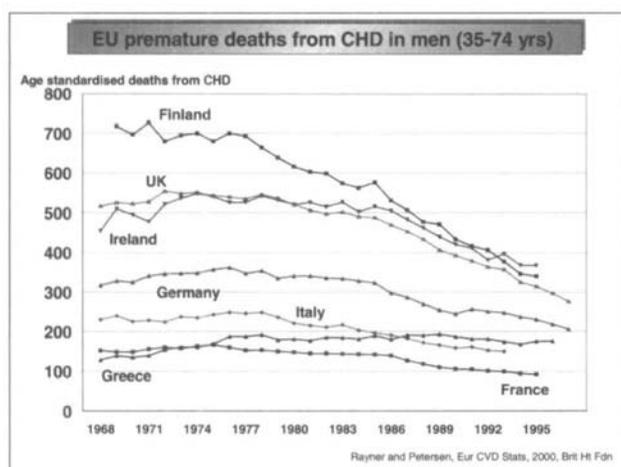


Fig. 1

Population preventive strategies as well as individual therapy are needed

These analyses in nutrition/public health terms were first introduced into international strategies by Rose and Blackburn in their 1982 WHO Technical Report⁷. This is illustrated in Fig. 1 of the Eurodiet first Working Party's analyses of nutrients in relation to public health. This analysis showed that if one tackled those in Europe with about an average cholesterol level, then the gains in preventing heart attacks would be about fourfold greater than that found by taking the classical medical approach of identifying only those with the highest cholesterol levels and reducing those levels to the lowest risk category. This analysis led to the idea that one should propose a shift downwards in the whole population's spectrum of cholesterol levels. This is conceptually completely different from the personal approach to health problems which most individuals have and on which doctors are trained to concentrate. So strong is the "prejudice" to concentrate on individual action that public health strategists have always been formulated to specify that both an individual high risk approach and a population strategy is needed. In practice the challenge is how to induce a shift in the distribution of risk without being accused of draconian measures

which specify exactly how people should behave and what they should eat, i.e. to avoid the crude and misguided criticism that public health strategies deny freedom of choice and require a "nanny state" approach.

The early Mediterranean diet prevented coronary heart disease

Figure 1 sets out differences in EU death rates from cardiovascular disease based on the latest analyses⁸. They indicate that Ireland, Finland and the UK still have the highest death rates for CHD in those below the age of 74 and within the EU the rates are 3 to 5 times greater than those observed in France. These startling differences apply on a national basis and must relate to environmental issues rather than genetic differences between the different national EU groups. A number of analyses have been made of the basis for these differences. Keys' three major risk factors certainly apply when there are studies conducted prospectively within each national group, but additional factors are still being sought to explain the remarkable national differences. Originally Keys and his colleagues in the Seven Country Study showed that the intake of saturated fat was highly correlated with the risk of death in men and at that stage the Greek, Italian and Yugoslav data suggested that saturated fat intakes of 7–10% were associated with a death rate which was 4–10 times lower than that observed in Finland where saturated fat intakes were about 23%. Detailed chemical analyses of composite diets based on the original diet records are shown in Table 1 which reveals the modest polyunsaturated fatty acid intakes, the much lower intakes of total fat than those currently consumed and the modest intakes of monounsaturated fats observed in all the low risk countries except Corfu and Crete. The intake of simple refined sugars at that stage was also negligible in these Mediterranean diets which in practice were based on substantial amounts of cereals, e.g. about 500 grams or more, vegetables (about 250 grams or more) and in Greece surprisingly high intakes of fruit. The intake of milk, fats and oils, meat and eggs was extremely small. It is this diet which therefore would appear to be optimum. In practice more recent studies have highlighted the fact that the differences across Europe are not readily explained by smoking, hypertension or high cholesterol rates so the less well specified, must apply. These include the benefits of high fruit and vegetable diets and other factors, e.g. low trans fatty acid intakes, all of which are thought to contribute to these different national levels of CHD.

Table 1 The traditional Mediterranean diet

% Energy	Southern Italy			Greece
	1930s	1960s	1960–65	1960–65
Fats	20	27	26	*32.5
Saturated FAs	5	8	9	7
Monounsaturated FAs	10	16	13	22
Polyunsaturated FAs	5	3	4	3
Simple refined sugars	2	2	<5	Approx. 0

*Chemical Analyses in the 7-Country Study with Crete 36%, Corfu 27%. Recent re-evaluation of some original diet records suggest 42% for Crete. Some fatty acid values estimated by difference.

Excess weight gain and obesity

Physical inactivity and excess weight gain are also important as illustrated in Fig. 2. There is no doubt that as the body weight of adults rises the prevalence of high fasting cholesterol and triglyceride levels and low HDL cholesterol concentrations increases as does the proportion of the population which has high blood pressure. These changes become very evident even within the normal body weight range (i.e. 18.5–24.9)⁹. It is important, however, to recognise as indicated in Fig. 2, that the impact of weight gain on cardiovascular disease is indirect with a whole host of other dietary factors and physical inactivity contributing independently to the risks of thrombosis and atherosclerosis. It is important to recognise, and often misunderstood, that the total fat intake has never been linked to the likelihood of cardiovascular disease – it is the quality of the fat that becomes crucial. Nevertheless, it has become increasingly clear in the last 15 years that obesity is particularly likely in individuals who are both physically inactive and on a high fat diet. Keys own studies revealed that the Greeks had the highest average body mass index

(BMI) on their higher fat diet but they had exceptionally low heart disease rates because the fat was very low in terms of its saturated and trans fatty acid content.

Numerous studies have shown the link between the fat intake of a group of individuals and the likelihood of gaining excess weight. There has recently, however, been much debate, led by Willett and his colleagues, suggesting that the transfer from a high to a lower fat intake might be hazardous because of the adverse changes in HDL and triglyceride levels¹⁰. In addition, Willett and his colleagues consider fat to be relatively unimportant because the reduction in weight once individuals persist with a lower fat intake is modest. It is, of course, important to recognise the distinction between primary prevention and secondary prevention. Bray and Popkin¹¹ have set out an analysis of the data supporting the importance of dietary fat in terms of the epidemiology of obesity. This is substantially supported by animal experiments which highlight the selective effect of fat in inducing excessive weight gain. Many physiological studies in man also demonstrate the propensity for “over-consumption” when individuals have free access to

The interlinking of physical inactivity and dietary effects on obesity and the progression of disease with industrialisation.

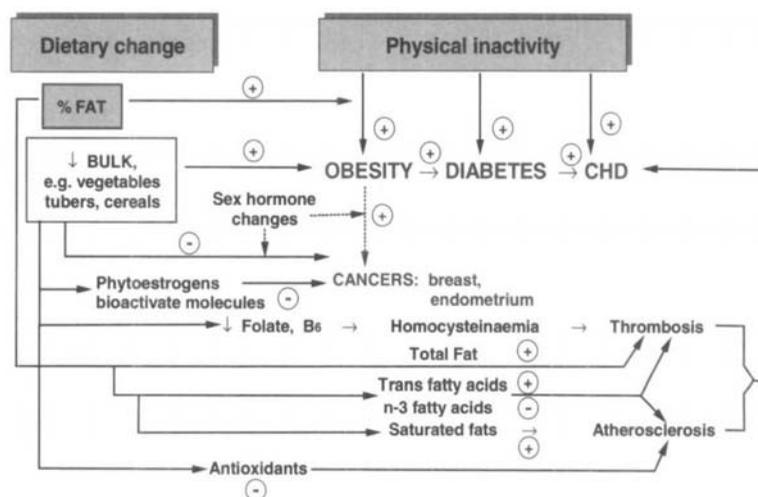


Fig. 2

foods of unrecognised high fat content. The more inactive the individual, the more likely they are to over-compensate for modest physical activity by inadvertently consuming modest amounts of energy-rich foods high in fat¹². Astrup, in the working documents for this conference, also sets out how reducing dietary fat does lead to clear weight losses which are greater in the overweight. It is also evident from a series of meta-analyses, from longer term interventions and from national data that whilst there may be a temporary adverse changes in triglyceride and HDL levels, these do not persist unless the dietary reduction in fat is substantial, e.g. down to 20–25% from 40%^{13,14}. Dietary changes which lead to intakes analogous to those observed in Table 1 have a marked beneficial effect in reducing blood pressure, particularly when there is an ample vegetable and fruit intake (DASH Trial I)¹⁵. Further, more extreme changes with a reduction in fat intake to 10% have been shown over a five-year period to lead to marked improvements in blood lipids with a highly significant reversal of arterial thickening¹⁶. Therefore although a reduction in fat intake has been advocated as part of a general strategy relating to cardiovascular disease, it is in practice simply a means whereby one can reduce the hazardous saturated fatty acids but at the same time bring benefit to individuals by limiting their rate of weight gain or indeed by helping to reduce their excess weight.

Attempts have recently been made to compare the effects of CVD risk factors risks in Finnish men¹⁷. This analysis suggested that sedentary living involving less than three episodes of physical exertion a week has a much greater impact on risk than cigarette

smoking, cholesterol levels, high blood pressure or overweight. These new analyses are indeed valuable in illustrating the need to discriminate the proportional impact of different factors. However, they do highlight how important it is to choose the appropriate optimum diet and activity levels. In practice, the high cut-off levels chosen as optimum for cholesterol, blood pressure and body weight had the effect of minimising their contribution. Now, however, there is a new WHO project in which we are attempting to assess the global impact of excessive body weight and of dietary differences on morbidity and mortality. Already it is clear that excess weight gain accounts for the majority of the increase in diabetes rates across the globe and is a very major risk factor for high blood pressure and indeed for other risk factors in relation to both coronary heart disease and stroke.

Figure 3 shows the astonishing differences between European countries in the prevalence of adult obesity. These figures have to be treated with caution because some of them are not based on nationally representative data and they also apply to different age groups. Nevertheless, in crude terms, it is clear that the populations of Yugoslavia and Greece now have exceptionally high rates of obesity despite Yugoslavia originally having perhaps half the fat intake of what it is currently and Greece also having much lower fat intakes. There is now clear evidence of an escalating epidemic of obesity in Europe and this will enhance the burden of ill health; the complications of obesity will emerge over the next two decades as the excess weight gain persists and as the population ages. Another disease, osteoporosis, is also projected to

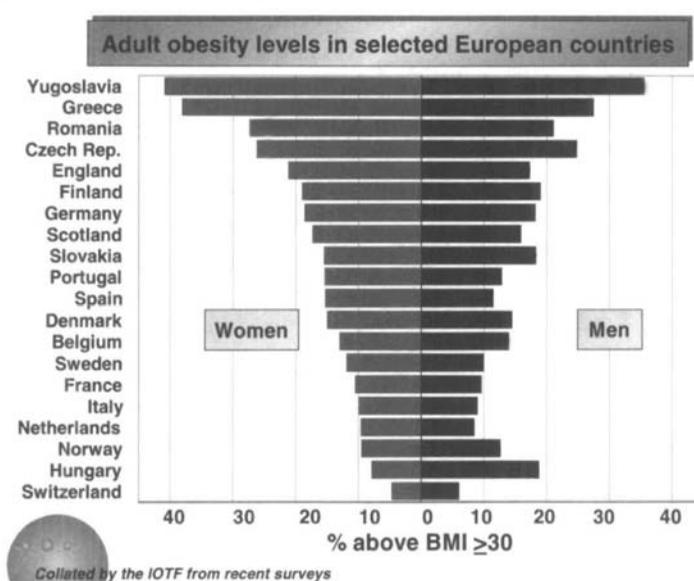


Fig. 3

increase, despite benefiting from weight gain; osteoporosis already produces an alarming burden of hip fractures in Europe and, as the population ages over the next 50 years, there will be a two to three-fold increase in annual fracture rates.

In addition to the major problems of cardiovascular disease, diabetes, obesity and their associated problems of high blood pressure, there is another major cause of death in the EU relating to diet. A number of European and global reports have now emphasised the contribution that diet can make to a variety of cancers. Those cancers which particularly involve the epithelium are affected by diet and an abundant supply of vegetables and fruit is shown consistently to be protective¹⁸. Perhaps a third of cancers relate to dietary factors but the laboratory proof is made more difficult by the need to show how dietary factors limit or promote a series of sequential gene changes which precede the development of the final carcinogenic process. Nevertheless, the evidence from human studies on risk is sufficient for there to be a generally accepted policy of attempting to ensure that children and adults consume throughout life far greater amounts of vegetable and fruit than are currently eaten in most European countries.

Developing integrated population dietary goals

When the analyses of different nutrients and the principal public health problems of Europe were considered, it became clear to the Eurodiet group of experts that numerous international expert groups had agreed on a series of specific population goals for diet so it was possible to develop a coherent and integrated set of nutrient and dietary goals. Almost all of these goals have been developed by recent expert groups within Europe so there is little conflict between the values set out in the table presented by the first working group and those of most member states. Included in the table are detailed notes presented to the conference and which set out some of the issues which concerned individual scientists. It should be emphasised that the experts in Working Party 1 were not there to develop goals on the basis of their own analysis of appropriate nutrient intakes. Instead they highlighted the issues and considered novel problems which may not yet have led to a consensus by the international expert groups of, for example, cardiologists, diabetologists, cancer specialists or obesity experts. Despite these consensus, however, there is no doubt that some of

these goals are seen to be controversial by some scientists. Thus the total fat intake, the salt values and the issue of whether sugar intakes should be expressed quantitatively have all been much debated. These issues are also, of course, of intense industrial concern so inevitably there has been a great deal of lobbying and questioning of the detailed evidence.

Current dietary intakes and the development of food based dietary guidelines (FBDG)

The second working party set out how best to develop a step by step approach to food based dietary guidelines following the original WHO/FAO meeting on this topic¹⁹. First it is important to identify which major food sources contribute the nutrients of interest and then to see which of these foods provides a substantial proportion of the nutrient intake on a population basis. The proposition was made that by looking at the variation of intake within countries it might be possible to discern which food groups should be highlighted as important when attempting to improve national diets. One of the problems with this general approach then emerges because the recent data from the Institute of European Food Studies on EU food intakes (see Fig. 1 in the Working Party 2 Report) shows that few countries in the EU at present have intakes of the principal nutrients of concern, e.g. total fat and saturated fat which are close to the optimum. Indeed, some intakes are far removed from the optimum. Therefore some of the national goals have been developed on a pragmatic national basis with expert groups recognising that the ideal goal cannot be specified because it is so far from the population mean intake. It is for this reason that the second working party highlighted the need to take a pragmatic view and to consider carefully what in practice could be done. When assessing, for example, total fat intake, one could readily identify particular foods which contributed substantially to fat intakes, but these foods differed markedly in their contribution across Europe. Therefore, it is unlikely that a clear food based system can be developed on a pan-European basis. So dietary guidelines are best generated on a national basis.

There is a variety of ways of assessing the distribution of intakes of different food groups. The second working party highlighted the value of considering the distribution of food intake in quartiles and assessing

which food groups made the biggest contribution to the differences between these quartiles. It is also important to identify the proportion of people who do not consume particular foods; the proportion of non-consumers can vary markedly by country. Thus in Finland 21% of those in the lowest quartile of national fruit and vegetable intake do not consume any fruit at all and 2% do not take vegetables. In Belgium, by contrast, 70% of those in the lowest Belgian quartile fail to eat fruit and 14% do not eat

Public health strategies to implement FBDGs and enhance lifestyles

Once FBDGs are established on a national basis then the issue is how best to develop suitable strategies for achieving changes in diet and physical activity. These issues were considered extensively by the third working party. It became clear that they had to contend with a number of myths. First that primary prevention strategies are not effective; secondly that they take too long to have an effect; thirdly that they inevitably involve telling people what to do: this is much resented. Fourthly it is claimed that the food industry will suffer. Finally, there is a myth specifying that nutritionists can never agree on either the goals or the preventive strategy so that the whole issue of diet and health is too controversial to warrant public policy making.

The recommendations of the Third Working Party were developed on a sectoral basis because this helps to make clear who should be considered responsible. The health care sector in Europe needs better training in the principles set out in the reports of the four working parties. Doctors and their colleagues need to become involved in broader community programmes and not simply concentrate on treating individual patients. It was also recommended that a European forum be established to allow an effective interchange and assessment of progress in public health strategies in different parts of Europe. Guidelines for primary health care workers relating to physical activity need to be developed because doctors continue to be, with other health professionals, ignorant about the role of diet and physical activity in health. Primary health care services and developments in health promotion also need to be linked to other regional services which are involved in the same activity. Finally the group highlighted the need for the health care personnel to change their own diets and physical activity so that

vegetables. The strategies needed in Belgium and Finland may therefore be very different if one is trying to increase the intake of fruit and vegetables and persuade non-consumers to start eating these foods. Other approaches include discriminant analysis of different food groups in relation to the variety of nutrients to be assessed. Cluster and factor analysis may also be helpful in highlighting strategies for modifying intakes. These issues are well dealt with in a symposium dealing exclusively with these issues²⁰.

they could, as with smoking, be exemplars of behavioural change and appropriate healthy living.

Schools were an obvious focus for change with changes in the curriculum being needed throughout the school age range. Modern concepts of diet and the need to teach children activity skills should be introduced to pre-school groups. School meals of an appropriate nutritional standard should be integrated with other educational changes in school as part of a coherent educational process. Teachers and their assistants need to be trained to develop a healthy active school environment which encourages family and community involvement. Obviously the school health services need to be seen as an integral part of this new development.

When children leave school their adult environment also needs to change with employers having not only responsibility but a real opportunity to improve the well-being of their work force by encouraging intervention programmes and helping with facilities to improve physical activity and the nutritional well-being of their workers. Management and staff are both best involved in working out how to undertake these changes and employer groups based on different industrial sectors as well as individual companies can be selected for particular innovative trials. Obviously the food industry itself has a major role to play not only with its own workers but also in developing and supporting the provision of healthier diets and foods. New product formulation, labelling initiatives, perhaps even pricing policies and the development of partnerships with the health sector are all opportunities for gaining mutual benefit. It is therefore a mistake to think of the food industry as an inevitable problem area when it comes to developing healthier diets in Europe and achieving major health gains.

Major benefits in some European countries from National Preventive Strategies

These proposals might seem routine and similar to those that have been developed over many years. They are, however, based on national experience within the EU and imply a totally different approach from the usual assumption that all one has to do in health promotion is to provide better information and education. The idea that nutrition education is the solution to dietary problems is a common fallacy. Experience in Finland has shown that by a systematic focusing on each component of society whether it is the health services, pre-school facilities, the school environment, restaurant and catering facilities or employee work canteens - the integration of initiatives in all these sectors can have the most dramatic impact on even the average intakes of a country. Thus over a 20 year period Finland increased vegetable intake threefold with a nearly two-fold increase in fish consumption and a marked fall in full fat milk use. This led to a reduction in saturated fat intake as part of a fall in total average fat intake from about 42% to less than 34% of energy consumed. In association with these changes which started in North Karelia, there was a remarkable fall in the prevalence of cardiovascular risk factors in the population. Thus the average blood pressure showed a remarkable 10 mmHg drop and the average cholesterol value of the Finnish adults fell by 15%. Such changes would be considered remarkable in a tightly controlled clinical trial of drugs for hypertension and any dietary change for lower cholesterol values. This illustrates the fact that in many parts of Europe there is a pessimistic view about intervention strategies and an incorrect assessment of the supposedly limited opportunities for inducing major changes in the risk profile. In association with these falls in risk, there has been a remarkable reduction in mortality rates in North East Finland from stroke and coronary heart disease with the observed mortality reductions being close to those predicted from the fall in risk factors²¹. In Finland there were also systematic strategies for reducing the salt, total fat and saturated fat intakes with specification of the precise nutritional quality needed in schools. Canteens and restaurants were encouraged and rapidly took on the concept of providing a salad bar and vegetables as part of the intrinsic cost of the main meal and a whole variety of policies were developed to set standards of food provision throughout society. Interestingly the same reduction in death rates occurred in both men and women

despite the women showing little change in smoking rates or even an increase. This emphasises the fact that although smoking is very hazardous, when it comes to cardiovascular disease, the impact of smoking is substantially dependent on the individual's eating habits being inappropriate²². Law *et al.*²³ emphasised some years ago that reducing blood cholesterol by 10% predicts on a long-term basis at least a 20% reduction in the incidence of CHD. In 40 year olds the benefit was for a greater than 50% fall in risk but even in 80 year olds there was still a 20% benefit. Thus we have underestimated the importance of improving the diet of Europeans throughout life.

Figure 1 presents the latest analyses of how different countries have coped with the recognition of such diverse death rates from CHD. The top three countries in European death rates are Finland, the UK and Ireland but the response is very different in the three countries. Finland showed the earliest effects and a dramatic fall whereas the UK showed very little change until about 1980, despite many international analyses and policy statements having become well-recognised for 20 years. When we assessed for WHO why these differences occurred and whether they related to different approaches by government, we were surprised to realise that across Europe one could see that the changes in death rate were preceded by dietary changes. These dietary changes were not, however, usually induced by novel policy proposals by government, but by major academic groups or individuals deciding to become major public advocates of the need for societal change. Thus in Finland there was a mass movement to improve the appalling death rates whereas in Britain the media focused endlessly on the array of experts who disagreed about the finer points of heart disease and how it might be caused. Indeed, some major charities seemed intent on maintaining the mystery about the basis for heart disease to keep their research funds rolling from public appeals. The third country, Ireland, was notable for the lack of a coherent academic initiative and indeed for academics promoting controversy on the dietary basis of heart disease.

Figure 1 also shows that the three countries in the EU with the lowest rates have shown very different responses over the last 30 years. Italian and French cardiovascular rates have been improving whereas Greece is the only EU country with a progressive rise, albeit from a low initial level. Kafatos has emphasised how the diet in Greece is changing with an increase in

fat intake and therefore the expected rise in both childhood and adult obesity. This problem is increased by the substantial reduction in physical activity. The dietary changes include progressive increases in saturated fat in addition to continuing high olive oil consumption, so it is not surprising that CHD rates are rising. Breast cancer and colon cancer rates are also on the increase. Other countries within Europe have seen appreciable declines in CHD rates, e.g. in Belgium and the Netherlands, but Germany (see Fig. 1) has only modest changes. Again it would appear that only recently have German nutritionists and doctors started to go public on the issues, so there is still much to do in the medical and nutritional professions.

The third working group therefore highlighted the importance of academics and public interest groups becoming involved in advocating the social and structural changes needed to support good dietary practices and an active lifestyle. Academics have a responsibility to raise the profile of these issues both in the media and politically and to ensure that they understand what is required in policy developments. They also have a role in changing the political spectrum and ensuring that there was appropriate resources allocated to initiating preventive programmes. The value of Nutrition Councils operating at a national independent level has also recently been highlighted by a UN report²⁴. Finally, the broad policy recommendations of the third working group involve a number of key recommendations as set out in Table 2

Policy developments needed

The fourth working group had the unenviable task of considering how best to take forward all these issues

within the context of the EU. After careful deliberation they concluded that a number of mechanisms are needed. First there is a need for the EU to prioritise diet and lifestyles in its analysis of the basis for the remarkable range in health across the EU. There is a great need to assess the health impact of the numerous EU policies which are being introduced, often without any assessment of their impact on diet and lifestyles. To promote this more effective assessment of current EU developments and thereby help to improve policies, the expert group advocated that the EU should establish a new Nutrition Committee because hitherto nutritional questions of enormous public health significance have been neglected. There was indeed a need to revise the current EU recommended dietary allowances, particularly as the US has just produced its own new recommendations. The group also recognised that there is a need to clarify the different responsibilities of the EU in relation to national roles but it seems unwise to think of the Commission becoming engaged in detailed and direct dietary advice to the public. Not only are there big differences in nutrient intake across the EU but the diet and cultural differences are often so marked that to be effective requires a sensitivity to local circumstances which is not readily achieved at a Commission level.

Recommendations for EU action

The Eurodiet group highlights the need for a coherent approach to the formal assessment of the state of health, diet and lifestyles of Europeans on a regular basis, e.g. every five to ten years. At present it is difficult to have any coherent analysis of the different diet and public health issues in Europe. There is indeed a need for a system analogous to that

Table 2 Recommendations on Public Health Strategies

-
- Tackle inequity and broader determinants of health.
 - Develop national strategies with:
 - population approach
 - multidisciplinary and integrated
 - complementary actions
 - work at different levels: industrial, community, environmental and policy
 - Consistent EU monitoring systems
 - All purpose leaflet for integrating different sectors.
 - Structured development of diet and activity strategies for different groups
 - Professional continuing education.
-

undertaken by the Centre for Disease Control in the United States. Health based research needs to be prioritised to deal with the real public health issues of Europe. This would inevitably involve a much more coherent analysis of dietary issues. EU multi-centre studies may well be needed on the continuing problems and there is certainly a need to support professional networks within the EU which can help consider the issues relating to diet and health as well as nutrition education.

On a more legislative basis, it is clear that dietary aspects of health claims and appropriate comprehensive food labelling are going to be big issues, as is the relationship of the EU to CODEX where nutrition claims have already been considered.

In conclusion, this EU programme of work has highlighted the intense interest that can emerge once a careful analysis is made of the enormous health burden in Europe linked to dietary issues. Recent EU analyses by the Institute of Public Health in Stockholm, Sweden suggest that the fraction of the total disease burden within the EU that relates to diet is greater than that associated with tobacco use²⁵. Within the top twelve issues tobacco is seen as the top contributor to ill health, with 9% of the total burden attributable to it. Alcohol (8.4%), overweight (3.7%), low vegetable and fruit intake (3.5%), physical inactivity (1.4%) and high saturated fat intake (1.1%) contribute and the percentages cited are all preliminary estimates of their contributions. There is, however, now a need to re-evaluate these issues, particularly our better understanding of the multi-faceted role of diet in relation to health. The problem is accentuated by the recognition that we may be dealing with very long term effects of changes in diet. Thus dietary changes in pregnancy as well as in childhood may affect lifelong health.

The dramatic differences in health burden across Europe are a vivid display of the opportunities for limiting the morbidity as well as the premature mortality of millions of people. The challenge is to gain recognition within the EU for these issues. Food safety is indeed important and high on the political agenda because of the great trade issues involved in food safety. Nutritional problems may, however, become equally politically difficult because advocating change in diets is of intense industrial interest. The health benefits that come from an optimum diet have now been shown for 40 years in Europe to be very substantial and it is surprising that we are so slow in

accepting this when, in the United States, Nutrition Summits and a series of NIH and Academy of Science initiatives highlight the importance of diet and health. As the EU expands, the challenge is even greater and the opportunities for benefit, given our current knowledge, are unprecedented. It is therefore a great challenge for us all to ensure that dietary aspects of health become a principal consideration of Health Ministers in the EU.

References

- 1 Delange F, Dunn JT, Glinner D. *Iodine deficiency in Europe. A continuing concern*. Plenum Press Publ, New York, 1993.
- 2 Alfthan G, Aro A, Gey KF. Plasma homocysteine and cardiovascular disease mortality. *Lancet*. 1997; 349(9049): 397.
- 3 Prevention of neural tube defects: results of the Medical Research Council Vitamin Study. MRC Vitamin Study Research Group. *Lancet*. 1991; 338(8760): 131—7.
- 4 Keys A, Brozek J, Hanschel A, Mickelson O, Taylor HL. *The Biology of Human Starvation*. University of Minnesota Press. Minneapolis, Minn. US. 1950.
- 5 Keys A. *Seven Countries: a multivariate analysis of death and coronary heart disease*. Cambridge MA. Harvard University Press, US, 1980.
- 6 Norum KR, Johansson L, Botten G, Bjorneboe GE, Oshaug A. Nutrition and food policy in Norway: effects on reduction of coronary heart disease. *Nutr Rev*. 1997; 55 (11 Pt 2): S32—9.
- 7 WHO Expert Committee on Prevention of Coronary Heart Disease. Prevention of coronary heart disease report of a WHO expert committee. World Health Organization Technical Report Series no. 678. WHO, Geneva, 1982.
- 8 Rayner, M. and Petersen, S. *European Cardiovascular Disease Statistics*. British Heart Foundation: Oxford. 2000
- 9 Shaper AG, Wannamethee SG, Walker M. Body weight; implications for the prevention of coronary heart disease, stroke, and diabetes mellitus in a cohort study of middle aged men. *British Medical Journal* 1997; 314: 1311—1317.
- 10 Willett WC, Dietary fat and obesity: an unconvincing relation. *Am J Clin Nutr*. 1998; 68: 1149—50.
- 11 Bray GA & Popkin BM. Dietary fat intake does affect obesity rate. *Am. J. Clin. Nutr*. 1998; 68: 1157—1173.

- 12 Stubbs RJ, Johnstone AM, O'Reilly LM *et al.* The effect of covertly manipulating the energy density of mixed diets on ad libitum food intake in 'pseudo free-living' humans. *International Journal Obesity & Related Metabolic Disorders*, 1998; **22**: 980–987.
- 13 Yu-Poth S, Zhao G, Etherton T, Naglak M, Jonnalagadda S and Kris-Etherton PM. Effects of the National Cholesterol Education Program's Step I and Step II programs on cardiovascular disease risk factors: a meta-analysis. *Amer J Clin Nutr*, 1999; **69**:632–646.
- 14 Parks EJ and Hellerstein MK. (2000) Carbohydrate induced hypertriglycerolemia: historical perspective and review of biological mechanisms. *AJCN*, 2000, **71**: 412–433.
- 15 Appel LJ, Moore TG, Obarzanek R, Vollmer WM, Svetkey LP, Sacks FM, Bray GA, Vogt TM, Cutler JA, Windhauser MM, Lin PH, Karanja N. A clinical trial of effects of dietary patterns on blood pressure. *N Engl J Med*, 1997; **336**: 1117–24.
- 16 Ornish D, Brown SE, Scherwitz LW *et al.* Can lifestyle changes reverse coronary heart disease? *Lancet* 1990; **336**: 129–133.
- 17 Haapanen-Niemi N, Vuori I, Pasanen M. Public health burden of coronary heart disease risk factors among middle-aged and elderly men. *Prev Med*, 1999, **28** (4): 343–8
- 18 World Cancer Research Fund/American Institute for Cancer Research Food, nutrition and the prevention of cancer: a global perspective. American Institute for Cancer Research: Washington, DC, US. 1997
- 19 World Health Organization. Preparation and use of food-based dietary guidelines: report of a joint FAO/WHO consultation. Technical Report Series, No. 880, Geneva, WHO, 1998.
- 20 Williams C, Wiseman M, Buttriss J, eds. Food-based Dietary Guidelines - A staged Approach. *British J. of Nutrition*. 1999; **81** Suppl 2: S29–153.
- 21 Vartiainen E, Puska P, Pekkanen J, Tuomilehto J, Jonsilakti P. Changes in risk factors explain ischaemic heart disease in Finland. *Brit Med J*, 1994; **309**: 23–7.
- 22 James, W.P.T. Nutritional disorders affecting the heart. In Julian, D.G., Camm, A.J., Fox, K.M., Hall, R.J.C. & Poole-Wilson, P.A. eds. *Diseases of the Heart* 2nd edition, pp. 1442–1458, W.B. Saunders Co Ltd., London, 1996.
- 23 Law MR, Frost CD & Wald NJ. By how much does dietary salt reduction lower blood pressure? III. Analysis of data from trials of salt reduction. *British Medical Journal* 1991; **300**: 819–824.
- 24 James WPT, Norum K, Smitasiri S, Swaminathan MS, Tagwireyi J, Uauy R, Ul Haq M. 2000. Ending Malnutrition by 2020: an Agenda for Change in the Millennium. Final Report to the ACC/SCN by the Commission on the Nutrition Challenges of the 21st Century. Supplement to the Food and Nutrition Bulletin, September/October 2000. UNU International Nutrition Foundation, USA.
- 25 National Institute of Public Health, Stockholm, Sweden. Determinants of the Burden of Disease in the European Union. European Commission, Directorate-General V. Sweden, Stockholm, 1997.