



Core Report

Preface

The Eurodiet project was initiated in October 1998 with the aim to contribute towards a co-ordinated European Union (EU) and member state health promotion program on nutrition, diet, and healthy lifestyles, by establishing a network, strategy and action plan for the development of European dietary guidelines.

The project has been supported by the European Commission (DG SANCO)* and co-ordinated by the University of Crete (Greece). Realisation of the project by the Eurodiet Steering Committee has entailed a two-year process (1998-2000) of scientific evaluation, consultation and debate:

Four Working Parties composed of distinguished European academics analysed and evaluated the scientific evidence (1) on the links between health and nutrients (2) on the translation of nutrients to food-based guidelines, (3) on effective promotion of these foods and healthy lifestyles and (4) on the opportunities and barriers posed by the broader policy framework. Throughout this process expert representatives from the spectrum of interests involved in this important area of public health have been invited to participate as observers in the meetings of the Steering Committee and of the Working Parties. This consultative base and the associated debate widened with the posting of the Working Party draft reports on the Eurodiet web site (<http://eurodiet.med.uoc.gr/>), and culminated with the European Conference held in Crete 18-20 May 2000 on Nutrition and Diet for Healthy Lifestyles in Europe : Science and Policy Implications.

This Core Report presents, in brief, the outcomes of this process. It is designed to give an overview to decision makers. The evidence and reference base for this core report are presented in two parts**:

1. The Eurodiet proceedings, comprising the final reports of the Working Parties and the proceedings of the Eurodiet Conference
2. The scientific papers commissioned for the Eurodiet Working Party reports.

These are designed for public policy advisers and others who wish to follow-up either general issues or specific topics in greater depth.

A strong theme of the Eurodiet project is the potentially enormous social and economic benefits to be gained from reducing the burden of nutritionally related morbidity and mortality in Europe. The Eurodiet reports, which are concerned fundamentally with the realisation of these benefits, offer a significant contribution to the emergent debate on nutrition policy in Europe.

A.G. Kafatos M.D.
Project Co-ordinator
Crete, June 2000.

C.A. Codrington PhD
Project Administrator

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** Project outcomes are available as 2 special issue supplements : (1) The EURODIET Reports and Proceedings and (2) Nutrition & Diet for Healthy Lifestyles in Europe : the EURODIET Evidence. Public Health Nutrition Vol 4. 2(A) and 2(B).2001.

Project Participants

The project has benefited greatly from the various contributions and ensuing dialogue between the many prominent scientists, other experts and stakeholder representatives who have participated. These are acknowledged here*, with special reference to the Working Party Chairs ([Anna Ferro-Luzzi](#), [Michael Gibney](#), [Michael Sjöström](#), [Jo Hautvast](#) and [Ibrahim Elmadfa](#)) and the Rapporteurs ([Philip James](#), [BrittMarie Sandstroem](#), [Lynn Stockley](#) and [Mike Rayner](#)) whose contributions have been critical to the success of the project.

Members of the Eurodiet Project Steering Committee

Ibrahim Elmadfa	University of Vienna	Austria
Anna Ferro-Luzzi	National Institute of Nutrition	Italy
Michael J. Gibney	Trinity College Medical School & Institute of European Food Studies (IEFS)	Ireland
Jo Hautvast	Wageningen Agricultural University	Netherlands
Serge Hercberg	Institute Scientifique et Technique de la Nutrition et la Alimentation (ISTNA)	France
Philip James	Public Health Policy Unit / IOTF	United Kingdom
Anthony Kafatos	Project Chair . University of Crete	Greece
Kaare Norum	University of Oslo	Norway
Brittmarie Sandstroem	Royal Veterinary and Agricultural University	Denmark
Michael Sjöström	Karolinska Institutet and Örebro University	Sweden

Participation as Observers

European Commission DG SANCO	Matti Rajala Henriette Chamouillet Basil Mathioudakis	
World Health Organization Regional Office for Europe (WHO/EURO) Food & Nutrition Division, Food & Agricultural Organization of the UN (FAO)		Aileen Robertson William Clay Guy Nantel
Confederation des Industries Agro Alimentaires de l'UE (CIAA)		Dominique Taeymans Maureen S. Edmondson
The Food Commission (UK)	Tim Lobstein	
Standing Committee of European Doctors	Jan Aghina	
European Public Health Alliance	Mary McPhail	
European Heart Network	Mike Rayner	
International Life Sciences Institute (ILSI)	Ian MacDonald	
In attendance		
Lynn Stockley :	Rapporteur Working Party 3.	Food and Nutrition Consultant (Independent) UK
C.A. Codrington :	Project Administrator	University of Crete, Greece

* We record here those who have participated in the work of the Eurodiet Working Parties prior to the Conference in May 2000. Contributions of other experts and of the participants to the Eurodiet Conference are acknowledged separately in the supporting documentation.

Members of the Eurodiet Working Parties

The Working Parties were composed of small core groups of distinguished scientists. Specific contributions from other prominent scientists were invited, and wide networks of experts were consulted.

Working Party 1 : Health & Nutrients

Remit : The Role of Diet and Lifestyles in Health & Disease Patterns in the European Union

Chair : Anna Ferro-Luzzi, National Institute of Nutrition (Italy).

Rapporteur : Philip James, Public Health Policy Group IASO/IOTF (U.K)

Core Group Members:

Arne Astrup	Royal Veterinary & Agricultural University	Denmark
Carlo Gennari	Institute of Internal Medicine, University of Siena	Italy
Serge Hercberg	Institut Scientifique et Technique de la Nutrition et de l' Alimentation (ISTNA)	France
Daan Kromhout	National Institute of Public Health (RIVM)	Netherlands
Aldo Pinchera <i>Substituted by Paolo Vitti</i>	Dept. Endocrinology & Metabolism, University of Pisa	Italy
Serge Renaud	INSERM University of Bordeaux 2	France
Elio Riboli	International Agency for Research on Cancer	France
John Scott	Trinity College Dublin	Ireland
Paolo Vineis	Unit of Cancer Epidemiology, University of Torino	Italy

Other scientific experts invited to contribute papers to Working Party 1 include:

David JP Barker	University of Southampton	UK
Katrina Brown	University of Aberdeen	UK
Tineke Brussaard	TNO Nutrition & Food Research Institute	Netherlands
Claudio Cortese	Dept. Internal Medicine, University of Rome	Italy
Francois Delange	International Council for Control of Iodine Deficiency Disorders (ICCIDD)	Belgium
Alan Jackson	University of Southampton	UK
Jacqueline Landman	Queen Margaret University College (Edinburgh)	UK
Patrick Ritz	Centre Hospitalier Universitaire d'Angers	France
Ilkka Vuori	UKK Institute for Health Promotion Research	Finland
Aubrey Sheiham	University College London	UK
Agneta Yngve	Karolinska Institutet	Sweden

Experts consulted include

Kaare Norum	University of Oslo	Norway
Anthony Kafatos	University of Crete	Greece
Eric Brunner	University College London	UK
John H. Cummings	University of Dundee	UK
Franz Kok	Wageningen University	Netherlands
Lars Bo Andersen	University of Copenhagen	Denmark

Observers

Maureen Edmondson	CIAA	
Susanne Ziesenitz	CIAA	Germany
Ian MacDonald	ILSI Europe	UK
Tom Sanders	ILSI Europe	UK
Gert-Jan Hiddink	Dutch Dairy Foundation for Nutrition and Health	The Netherlands
Vincenzo Dona	Unione Nazionale Consumatori	Italy

Jan Aghina	Standing Committee of European Doctors	The Netherlands
Francisca Serra	European Commission DGXII	Belgium

Working Party 2 : Nutrients & Foods

Remit : A Framework for Food-Based Dietary Guidelines in the European Union
Chair : Michael Gibney, Trinity College Medical School & IEFS (Ireland)
Rapporteur : BrittMarie Sandstroem, Royal Veterinary and Agricultural University (DK)

Core Group Members

Michael Löwik	TNO Nutrition & Food Research Institute	Netherlands
Martin Wiseman	MAFF Dept of Health	United Kingdom
Wulf Becker	National Food Administration	Sweden
John Kearney	IEFS, Trinity College	Ireland
Liisa Valsta	National Public Health Institute	Finland
Sheila Bingham	Dunn Human Nutrition Unit	UK
Catherine Leclercq	Instituto Nazionale della Nutrizione	Italy
Stefaan de Henauw	Ghent University	Belgium
Lluis Serra Majem	University of Las Palmas de Gran Canaria	Spain
Pagona Lagiou	National School of Public Health	Greece

Observers

CIAA	Anne Heughen	Van den Bergh Foods Ltd.
CIAA	Susanne Langguth	Sudzucker AG
ILSI-Europe	Menrike Beukers	
International Dairy Federation	Yvette Soustre	

Other Experts Consulted include :

Hans-J. Franz Zunft	German Institute of Human Nutrition & University of Pottsdam	Germany
Antonia Trichopoulou	University of Athens	Greece

Working Party 3 : Foods & People

Remit : Toward a Public Health Nutrition Strategy in the European Union to implement FBDGs and to Enhance Healthier Lifestyles
Chair : Michael Sjöström, Karolinska Institutet and Örebro University (Sweden)
Rapporteur : Lynn Stockley, Food & Nutrition Consultant (UK)

Core Group members

Barrie Margetts	University of Southampton	U.K
Daniel Warm		
Aulikki Nissinen	University of Kuopio	Finland
Carmen Perez Rodrigo	Unidad de Nutricion Comunitaria	Spain
Maria Daniel Vaz de Almeida	Oporto University	Portugal
Agneta Yngve	Karolinska Institutet	Sweden
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Elizabeth Dowler	University of Warwick	U.K
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Seppo Miiunpalo	UKK Institute, Tampere	Finland
Wilhelm van Mechelen	EMGO Institute, Vrije University	Netherlands

Experts Consulted :

Lars Bo Andersen	University of Copenhagen	Denmark
Ken Fox	University of Bristol	UK
John Kearney and	IEFS, Trinity College	Ireland
Adrian Bauman	University of Sydney	Australia
Rod Dishman	University of Georgia	USA

Observers Consulted

European Heart Network :	Ineke van Dis (NL)	
Standing Committee of European Doctors (CP) :	Jan Aghina	
Dutch Dairy Foundation on Nutrition & Health :	Gerrit J. Hiddink	
CIAA :	Johan De Rycker	Raffinerie Tirlemontoise. Kelloggs.
CIAA :	Anne-Laure Gassin	
Dole Europe :	Aurelie Foucat (F)	
European Public Health Alliance :	Genon Jensen	
European Advisory Services	Chris Downes (B)	
Health Education Authority	Leslie Hammond Bob Laventure Karen Peplow Di Swanston	U.K.

Working Party 4 : People and Policies

Remit :	Policy, Trade, Economic and Technological Aspects of Improving Nutrient Intake and Lifestyles in the European Union.	
Co-Chairs:	J. Hautvast, Wageningen Agricultural University (NL) I. Elmadfa, University of Vienna (Austria)	
Rapporteur:	Mike Rayner, University of Oxford (UK)	

Experts and representatives consulted at a meeting in March 1999

Arie Oskam	LUW	NL
Christopher Ritson	University of Newcastle	UK
Walter Schiebel	Universitöt for Bodenkultur Wien	Austria
Borje Karlsson	National Board of Agriculture	Sweden
G. Wolfram	Instut fuer Ernährungswissenschaft der Technischen Universität Munchen	Germany
J.P. Laplace	INRA	France
J.K. Huttunen	National Public Health Institute	Finland
Tim Lang	Thames Valley University	UK

Representatives :

COPA and COGECA	Risto Volanen, Secretary General.	
CIAA :	Dominique Taeymans	
CIAA :	Thierry Gregori, Federation des Industries des Charcuteries Francaises	
International Dairy Federation	Edward Hopkin, Secretary General.	
European Public Health Alliance:	Ginon K. Jensen	
European Advisory Services :	Dionne Heijnen; Chris Downes.	
DGIII :	Basil Mathioudakis	
DGV/F/3 :	Jan-Ole Gudmundsen	

ILSI Europe	Niels-Georg Asp
OVAG :	Paul Oliver Kaukal (Austria), substituted by Dr Maria Doukakis
Unilever Nutrition Centre	Paul Verschuren
Nestle R & D Center	Olivier Ballevre,
Nestle R & D Center	Gayle Crozier Willi
Proctor & Gamble	Detlef Muller,
Dole Europe,	Jacqueline Mailly, O'Connor & Co. (B)

[Representatives consulted at stakeholder hearings November and December 1999](#)

Beate Kettlitz	The European Consumers' Organization	
Gayle Crozier Willi	Nestle	Switzerland
Susanne Langguth	Sudsucker	Germany
Benedicte Masure	European Dairy Association	
Dominique Taeymans	CIAA	
Paul Verschuren	Unilever	Netherlands
Chris Downes	European Responsible Nutrition Alliance	
Alexandra Nikolakopoulou	EuroCommerce	
Berry Danse	ILSI Europe	

[Other Experts and stakeholders consulted include](#)

Tim Lang	Thames Valley University	UK
Eric Brunner	University College London	UK
Elizabeth Dowler	University of Warwick	UK
Susanne Logstrup	European Heart Network	
Basil Matthioudakis	European Commission: DG Enterprise	
Patti Rundall	International Baby Food Action Network	
Michael Sjöström	Karolinska Institutet	Sweden
Lynn Stockley	Nutrition consultant	UK
Dominique Taeymans	CIAA	
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Nutrition & Diet for Healthy Lifestyles in Europe : Science & Policy Implications

The Challenge

There have been dramatic changes in the food and public health scenario since the spectre of hunger and deficiency diseases haunted Europe in the 1940s. Political and socio-economic developments which have transformed Europe have in the process secured an abundant food supply, and life expectancy continues to increase steadily in most European Union (EU) Member States.

But alongside these positive changes, we have also witnessed a huge increase in several chronic diseases which are now recognised as being linked to dietary and lifestyle factors. Notably, nutritional factors and inactive lifestyles are implicated in

- between 30-40% of cancers
- at least one third of premature deaths from cardiovascular diseases (CVD) in Europe
- the pan-European 'epidemic' in obesity and overweight, which in turn is linked to maturity onset diabetes mellitus, increased risks of CVD and certain cancers, and premature death
- osteoporosis and its consequences, including the increasing number of hip fractures in the elderly (382,000 in the EU in 1995).

Dietary factors are also critically linked to dental caries, iron deficiency, and iodine deficiency disorders

The impact of these developments has not been uniform. There are large variations in adult disease patterns between countries in the EU (for example, in the incidence of CVD and certain cancers). There are also marked and growing inequalities in health status and life expectancy between socio-economic groups within many EU Member States. The importance of dietary practices, breast-feeding rates, physical inactivity and other life-style issues in explaining much of these variations is now being recognised.

A definitive audit of the economic burden of nutrition-related ill-health has yet to be compiled. Currently available estimates indicate that direct costs in terms of health care expenditure in the Member States is enormous, in the order of billions of Euros. Recent analyses from the Institute of Public Health in Sweden, estimated in terms of disability adjusted life years (DALYs), suggest that dietary factors and a sedentary lifestyle impose costs which exceed that of tobacco use within the EU.¹ Moreover, the burden of ill health on the public and on European health services is steadily rising with an expanding elderly population.

The current crises in confidence relating to food safety therefore needs to be put into perspective: nutritional imbalances account for over one hundred times more premature – preventable - deaths than food-borne infections in Europe. Yet despite the burden of nutrition-related diseases on the health care systems and economies of Member States, scant resources have been allocated to attempting to prevent the diseases rather than treating them. In Europe as a whole, the budget in member states specifically for health promotion is, on average, less than 1% of the total health budget.

¹ National Institute of Public Health : Determinants of the Burden of Disease in the EU. NIPH, Sweden, 1997.

Science & Policy Implications

European food and public health policy is currently in state of flux, which creates opportunities for the development of a coherent approach to the promotion of healthy diets and lifestyles throughout Europe. Developments include : creation of the new Directorate General of Health and Consumer Protection (DG SANCO) ; the European Commission White Paper on Food Safety – and commitment therein to the development of nutrition policy; the food and nutrition Action Plan for the WHO European Region proposed for 2000-2005 ; the new programme of Community action in the field of public health (2001-2006); recognition of the recently established European Network of Public Health Nutrition (ENPHN); and proposals for a Council resolution on nutrition policy during the French Presidency (July-December 2000).

The Eurodiet project (1998-2000) was commissioned in recognition that the considerable body of scientific evidence on healthy nutrition and lifestyles needs to inform health policy, and to define practical guidelines for diet-related disease prevention/health promotion strategies.

The Eurodiet project has evaluated 4 inter-linked elements on [the state of the art](#). That is:

[What do we know now](#)

- About the relationships between health & nutrients
- About translating nutrient targets into effective food-based dietary guidelines (FBDG)
- About effective ways of encouraging health promoting changes in eating and physical activity patterns
- About the barriers and opportunities of the existing policy framework

[What needs to be done and how](#)

- Actions required to take the scientific recommendations forward and the added value of EU level policy and structures

In brief, the [main conclusions](#) are as follows :

- The burden of disease exists in the majority of the population, and not in high-risk groups. The optimal public health strategy is thus to focus on the population as a whole, rather than targeting those with increased risk factors or pre-existing disease.
- Population goals for nutrients, some foods, and lifestyle features which are consistent with the prevention of major public health problems in Europe are specified (Table 1)
- Within the EU intakes of nutrients and levels of physical activity often differ markedly from the optimum. In developing food-based dietary guidelines, there is a need to recognise the difficulty of achieving these goals in the short term. Intermediate targets may be developed as a pragmatic step to improve health.
- Scientific considerations in translating population goals into food based dietary guidelines for individuals (and the associated recommendations in terms of technical 'tool kits' for development of evidence-based and hence effective FBDG) indicate that the appropriate development and delivery points are at regional/national level. The added value of EU level action lies in the harmonisation of monitoring and surveillance systems to enable evaluation and effective health impact assessment.

- At present, the most commonly applicable FBDG for the EU is for an increase in fruit and vegetable intake, and increased prevalence and duration of breast-feeding, accompanied by guidelines for increased physical activity.
- Given the variation in national health patterns within the EU, and the remarkable improvements in public health achieved by coherent and sustained national strategies introduced for example in Finland and Norway, there is a need to promote major changes in the prevalence of exclusive breast-feeding, better dietary practices and increased physical activity in many parts of Europe over the next 10 to 20 years.
- Substantial investment of resources will be necessary to develop public health nutrition strategies, but the amount of money needed is dwarfed by the potential these strategies have to decrease the vast social and economic burden currently imposed by diet and physical activity related diseases.
- Finally, the evidence base points to the importance of co-ordinated, multi-sectoral and population wide strategies. In order to develop and implement such strategies, identifiable structures and mechanisms will be needed at a national level within member states (for example, establishing or strengthening of intersectoral food and nutrition councils), and at European level, the creation of a new European Standing Committee on Nutrition.

1 Health & Nutrients

European Diet & Public Health: the Continuing Challenge

Population Burdens of Disease

Given that diet and physical inactivity are the principal causes of so many diseases, the expectation is that particular individuals can be readily targeted to rectify their specific dietary problem. Unfortunately, simple dietary analyses are difficult to undertake, inaccurate and of only modest use in allowing a dietary “abnormality” to be rectified. The individuals who succumb to a disease are usually on a similar diet and activity pattern to their neighbours. The disease emerges because of the individuals’ particular susceptibility, which is determined by a complex array of genetic factors and other features of body size and organ function which reflect previous stresses, illnesses and dietary practices. Thus, it is the interaction between diet and other environmental conditions with the individual’s susceptibility that usually determines the age of onset and the severity of the disease in a particular individual. On an European basis, however, it is the population’s dietary and activity patterns which make a substantial contribution to the national burden of ill health and the nature of the demand for health care services.

The majority of cases of the principal diseases in Europe occur amongst the majority of the population with modest individual risks at about the average level for the population. This implies that there is a need to identify the optimum range of dietary intakes for a population. This is best done in quantitative terms, since specifying that individuals should eat more or less of a particular food or nutrient presupposes – unreasonably - that they are, or can be made, aware of their position in the population spectrum of intake and risk. Once the population average is specified, high risk groups with particular needs may also be identified.

Population Goals

Table 1 sets out population goals for nutrients, some foods, and lifestyle features which are consistent with the prevention of major public health problems in Europe. These goals are based on the latest figures developed by different international and national professional groups.

The strength of evidence criteria used in setting these targets is also shown. It should be noted that this classification is based on the most rigorous requirements with the best evidence demanding good quality randomised double-blind placebo controlled trials. These are readily undertaken with drugs or some other interventions but are difficult in practice in nutrition unless the nutrient can be taken as a pill. Dietary interventions, e.g. on breast-feeding or with major dietary changes are usually impossible to conduct on a double-blind basis. Thus nutritional policies may need to be developed and implemented on other grounds, for example where there is a coherence of evidence from different sources, and where the burden of disease is such that undue delay in developing policies could in itself contribute to the burden of ill health within a society.

Physical Activity Levels (PAL): PAL is the ratio of total daily energy expenditure to estimated basal metabolic rate. The PAL value target (>1.75) is equivalent to 60-80 minutes walking daily to avoid weight gain on high fat intakes; this includes the 30 minute per day goal for preventing cardiovascular diseases and diabetes.

One of the major emerging issues relating to public health in Europe is the pervasive influence of a sedentary lifestyle with physical inactivity becoming the norm for the majority of children and for adults as they age. Physical activity is profoundly important not only in combating excessive weight gain but also in having remarkable effects on general well-being and in the prevention of a variety of diseases, e.g. diabetes, coronary heart disease, high

blood pressure, stroke and some cancers. It is also important in limiting bone loss if the activity involves weight bearing. Activity and the maintenance of muscular strength and the ability to prevent stumbling is also an important preventive measure which can have a major influence in reducing the risk of falls and fractures in the elderly. The ability to maintain physical activity throughout life is therefore of profound significance and needs to be incorporated systematically in public health and environmental policies relating to traffic management, pedestrian walk ways, cycle tracks, school and workplace facilities.

Body Mass Index (BMI): the specified BMI 21-22 is the optimum population mean BMI which both limits the likelihood of underweight and of obesity. Excess weight gain and obesity in children as well as in adults is now a major public health problem in Europe as elsewhere in the world. WHO has proposed for individuals a range of 18.5 to 25.0 as the normal limits and this range also applies to pre-pregnancy weights. New detailed studies suggest an optimum individual BMI of about 20.0, with Asians being especially susceptible to weight related diseases at BMIs of 23 – 24 or over.

The specified goal for dietary fat content as percent total energy is for the primary prevention of obesity, and is not based on any suggested link with the development of cardiovascular disease. Higher fat intakes can be compatible with health, but only if high physical activity is sustained throughout life; a 35% fat value has been cited by FAO/WHO as an option for individual adults with sustained physical activity. In sedentary societies, however, such as those in Europe, societal relationships and physiological studies seem to indicate that energy balance can only be achieved with less energy dense diets and with population average fat intakes of <30% fat. Some would argue that the population target should be as low as 20 to 25% of total energy intake. There is current concern about the need to increase the n-3 fatty acid content (found mainly in marine oils) of European diets with the European consensus on coronary prevention (1998) proposing the particular intake shown. The appropriate ratio of n-3 to n-6 fatty acids is of particular interest..

The recommendations on dietary carbohydrates propose that at least 55 % of dietary energy derives from this source. This is in agreement with the value proposed by FAO/WHO, who also specify that the bulk of the carbohydrate containing foods should be rich in non starch polysaccharides i.e. fibre, and with a low glycemic index. The frequency of consumption of refined sugars, particularly sucrose, is critical to the development of dental caries. The limit specified relates to the maximum number of occasions (four or less) when sugary foods, snacks or drinks should be consumed. The limit therefore applies to all episodes of sugar consumption per day.

A large consensus exists on the health-protective effect of the consumption of an abundance of fruit and vegetables, and there is a general agreement on the average value of 400 g/day as proposed by WHO, WCRF and many other bodies. The goal for fruit and vegetables intake would also help in ensuring an adequate intake of folates. Currently, folic acid needs are not being met in perhaps the majority of Europeans. New evidence shows that folic acid deficiency can induce anaemia, neural tube defects (NTD) in babies born to deficient mothers, and that a majority of adults have biochemical indices of folate inadequacy with evidence of increasing risk of such cardiovascular diseases as coronary heart disease and stroke. An intake of 400 µg folate is advocated by WHO, the US Academy of Science and other bodies. Dietary folates are about 50% bioavailable. This means that the prevention of NTD might require higher intakes of dietary folates and the use of folic acid.

The goal for fruit and vegetables intake, coupled with the target for a high consumption of fibre-rich carbohydrate foods (eg whole grain cereals, legumes) would also ensure that the specified population goal of at least 25 g/d of dietary fibre is met. This value is consistent with the FAO/WHO (1998) report on carbohydrates. A high fibre diet is linked to the prevention and management of weight gain and obesity, and to limiting the development and severity of diabetes. Benefits also seem to accrue for the prevention of coronary heart disease, stroke, and some cancers

The recommended value of less than 6 g/d salt intake is based on the International Task Force for the Prevention of Coronary Heart Disease . The WHO International Society of Hypertension Guidelines for the Management of Hypertension noted that obese, elderly and black subjects are most susceptible to hypertension. Some independent experts and some industrial groups, and one recent Canadian report maintain that only hypertensives need to reduce their salt intake but this proposition neglects the concept of primary prevention, the observed intervention studies on non-hypertensives and now the new evidence from the DASH trials. The national benefit from reducing average population blood pressure is much greater than that derived from managing the smaller number of hypertensive patients at high risk.

The population goal of exclusive breast-feeding for about 6 months is based on scientific evidence on the physiological and psychological benefits for both maternal and child health. It is also consistent with the most recent position of WHO EURO. Exclusive breast-feeding provides the child immunological protection and lowers the risk of infections and of atopic diseases such as asthma. It may also limit the development of childhood obesity and of non-insulin dependent diabetes in later life. In addition the mother has a more favourable post-pregnancy weight loss and a reduced risk of pre-menopausal breast cancer. The average population goal is about 6 months, but for individuals exclusive breast-feeding should continue for at least four months and breast-feeding should be the principal source of milk for the infant until one year of age.

The iodine intake required for avoidance of iodine deficiency disorders is well established. Iodide deficiency still occurs in Europe, although its main global burden in terms of brain damage in children and goitre and mental slowing in adults occurs elsewhere. Nevertheless, because of the inadequacy of salt iodisation in several EU countries, modest goitre is still present. With an average intake of 150 $\mu\text{g}\cdot\text{d}^{-1}$ populations appear to be free of iodine deficiency disorders and at a minimum risk of the iodine supplementation side-effects, especially hyperthyroidism, the development of autoimmunity and thyroid cancer.

Besides the nutrients and other features specified in Table 1, population nutrient goals have been developed addressing other conditions and diseases of public health relevance in Europe, such as iron deficiency anaemia. (which is common in babies, children and young women of reproductive age in Europe) and osteoporosis. Thus, an iron intake of 15 $\text{mg}\cdot\text{d}^{-1}$ has been considered appropriate by the EU for European women. An average population intake $>800 \text{ mg}\cdot\text{d}^{-1}$ calcium is being proposed, as well as 10 $\mu\text{g}\cdot\text{d}^{-1}$ vitamin D for elderly people. (Vitamin D deficiency is pandemic in many European countries with even the elderly in Mediterranean countries affected despite living in sunnier climates. This deficiency contributes to a substantial health burden from bone disease in the EU). Intervention studies in post-menopausal women suggest benefits from high calcium intakes, although it is fully recognised that other factors contribute to maintain adequate bone mass in old age. An appropriate fluid intake is also required and an average intake of 2 l of water or 30 ml water per MJ food energy. This water intake includes intrinsic food water and that derived from prepared dishes. This intake is deemed necessary to maintain health at all ages.

A variety of US, UK and Australian official reports give figures for a moderate alcohol intake of $<24\text{-}32\text{g}$ for men and $<12\text{-}24\text{g}$ for women. However, despite the evidence of a potential benefit regarding the prevention of cardiovascular disease, risks of other nature are associated with even low intakes. Thus countries with particular concerns about high alcohol intakes, e.g. Finland and France, advocate a fall in current intakes and specify higher limits. Women are advised in all countries except Canada to drink less because of their greater metabolic and toxicological sensitivity. Cost-benefit analyses based on the social welfare as well as health benefits need still to be carried out.

TABLE 1

Population goals for nutrients and features of lifestyle consistent with the prevention of major public health problems in Europe¹.

Component	Population goals	Levels of evidence ²
Physical Activity Levels (PAL)	PAL > 1.75 ³	++
Adult Body Weight as BMI	BMI 21-22	++
Dietary Fat % E	<30 ³	++
Fatty Acids % total E		
Saturated	< 10	++++
Trans	<2	++
Polyunsaturated (PUFA)		
n-6	4-8	+++
n-3	2 g linolenic + 200 mg very long chain	++
Carbohydrates Total % E	>55	+++
Sugary food consumption, occasions per day ⁴	≤4	++
Fruit and Vegetables (g.d ⁻¹)	>400	++
Folate from food (µg.d ⁻¹)	>400	+++
Dietary Fibre (g.d ⁻¹)	>25 (or 3g/MJ)	++
Sodium (expressed as sodium chloride) (g.d ⁻¹)	<6	+++
Iodine (µg/d)	150 (infants - 50) (pregnancy - 200)	+++
Exclusive Breast Feeding	About 6 months	+++

1. Other nutrient goals, e.g. on iron, calcium, alcohol, water and vitamin D are important and are included in the text.
2. Levels of evidence are based on those used in several guideline systems, e.g. the Cochrane System, the US Academy of Science scheme and the systems used in the assessment of diet in relation to cancer by WCRF (1997) and member state expert bodies. These other systems are included because it is often difficult to undertake dietary studies in a double blind placebo controlled manner as for drug trials. Thus the best evidence is considered as convincing by these expert groups when integrating meta-analyses of different types of study but are nevertheless classified as either ++ or only +.
 - ++++ Multiple double blind placebo controlled trials.
 - +++ Single study of double blind analyses or, for breast-feeding, a series of non-double blind analyses.
 - ++ Ecological analyses compatible with non-double blind intervention and physiological studies.
 - + Integration of multiple levels of evidence by expert groups.

These trials and other analyses do not prove that only the precise values in Table 1 are correct, but the evidence from dietary change or differences support these values.
3. Sedentary societies will probably need to be on a lower fat intake, e.g. 20-25% to avoid excessive weight gain. The PAL value is equivalent to 60-80 min. walking daily to avoid weight gain on high fat intakes; this includes the 30 min. goal for preventing cardiovascular diseases and diabetes.
4. An occasion includes any episode of food and drink consumption in the day. This limited intake is compatible with many member states' limits on total sugar intake and the Nordic concern to limit the intake of children and those adults on low energy intakes to no more than 10%.

2 Nutrients & Foods

A Framework for Food-Based Dietary Guidelines (FBDG) in the European Union

Translating nutrients into foods

Epidemiological and experimental research provides the scientific background for specific recommendations on individual nutrients and the appropriate diet composition (as % energy). The benefit of nutrient targets is that there is a huge choice of dietary patterns which can be used to achieve these goals. That is, they do not need to be specified in a rigid way. But to be useful in public health nutrition programmes and meaningful to individual members of the general public, these nutritional recommendations have to be translated into relevant, quantitative guidelines for specific food choices.

The need to develop food-based approaches was highlighted at the International Conference on Nutrition (ICN) of FAO/WHO in 1992. In 1995, a joint FAO/WHO consultation on food-based dietary guidelines (FBDG) was convened and its report² gives the rationale and the over-all strategy for the development of FBDG. The report identifies two key principles that should apply. The first is that FBDG should be based on an existing public health problem rather than on a difference between desired and actual intake of nutrients. The second key principle identified was that FBDG should be based on customary dietary patterns and take socio-economic and cultural factors into account.

Consequently, FBDG will vary among population groups and between individual countries or areas in EU. Furthermore, it may be necessary to determine "Interim Attainable Dietary Guidelines" (IADG) in those cases when the target optimal intake deviate substantially from prevailing food and nutrient intake. It is important to note that IADG are used solely to assist in the development of FBDG and as such are not in the public domain.

FBDG already exist in some EU countries either nationally developed or adopted from US FBDG. However, they have seldom been developed through the strategies described in the FAO/WHO report and the validity of the approaches taken is seldom documented. Many of the widely accepted tenets have been shown to be invalid when they are tested using food and nutrient intake databases.

Current patterns of food consumption in the EU

Analyses of existing data for prevailing patterns of nutrient and food intakes in the EU indicate huge gaps between proposed nutrient targets and actual consumption patterns.

In terms of nutrient intakes, for example, available data indicates that few, if any, Member States have diets with less than 30% of dietary energy from fat, and that only 3 have intakes of less than 35% energy from fat. Available data also indicates that only two Member States are at 12% or less for % energy from SFA. Analyses of nutrient intakes also indicates a clear tendency for the composition of dietary fat (% w/w fatty acids) to remain constant irrespective of % energy from fat level. The % energy from fat tends to be higher, (with the exception of Germany and Ireland) in groups with lower fibre intakes. When high and low intakes of fruits and vegetables are compared, there is little difference in % fat energy in many countries. The % energy from SFA is always lower in the higher fibre quantiles and in higher fruit and vegetable quantiles.

In terms of food intakes :

- patterns of food intake associated with low and high intakes of the nutrients examined (total-fat, saturated fat, dietary fibre and the food group fruit and vegetables) were not

² FAO/WHO. Preparation and Use of Food-Based Dietary Guidelines. Geneva : WHO, 1998.

- consistent between countries highlighting the variability in food consumption patterns across Europe.
- Large inter-country differences exist for both fruit and vegetable intake. Notable differences in the patterns of (a) fruit and (b) vegetable consumption suggest that it may not be appropriate, or effective, to combine fruit and vegetables as a single aggregated food group when giving recommendations to increase their levels in the population.

Approaches to the development of FBDG

The Eurodiet group identified a number of approaches to the practical development of FBDG. At the most simple level, there is the quantification of the contributions of foods to the intake of the target nutrient at mean population level. However, this relies on inference to determine which foods merit most attention. The next level of analysis is to examine the intakes of foods in the total population and among consumers only in the upper and lower quartiles or tertiles of intakes of the target nutrient. This allows for the statistical determination of foods which distinguish between higher and lower intakes of the target nutrient. In addition, the working group explored other approaches such as cluster and principal component analysis, food intake modeling, univariate correlations between intakes of foods and nutrients, patterns of converging and diverging foods and the working group also considered foods eaten inside and outside the home. The precise methodology used to elucidate evidence based FBDG needs to be determined according to the resources available and the output of these analysis will vary both within and between member states depending on the population being targeted i.e. different age or socio-economic groups.

In general, the Eurodiet group considered that the approach taken by the FAO/WHO report on FBDG should be the starting point for the member states.

At present, the most commonly applicable FBDG for the EU could be an increase in fruit and vegetable intake, increased physical activity and increased prevalence of breast feeding.

Acknowledging the large cultural and socio-economic differences existing in the EU as well as the differences in prevalence of diet-related diseases, FBDG should first be developed within member states to tackle identified public health problems. Progression should be to move from member states to geographic clusters to EU level. To facilitate and harmonise this process, it is necessary to agree upon a common method for food intake studies. This methodology could be accepted in full by countries with no existing methodology and in sub-samples in target populations in countries where existing methodologies are unlikely to be changed.

3 Foods & People

Toward Public Health Nutrition Strategies in the European Union

Public Health Nutrition is the promotion of good health through nutrition and physical activity and the primary prevention of related illness in the population.

The strategies proposed here are not intended to be prescriptive. The aim is to provide practical suggestions for developing public health strategies, which member countries can use and tailor to the social, cultural and health needs of their populations.

The burden of disease exists in the majority of the population, and not in high-risk groups. The optimal public health strategy is thus to focus on the population as a whole, rather than targeting those with increased risk factors or pre-existing disease.

The evidence base to identify effective ways of improving dietary and physical activity patterns is growing rapidly. Systematic reviews of this research have concluded that the most effective initiatives are population wide and adopt an integrated, multidisciplinary, comprehensive and sustainable approach, and involve a complementary range of actions which address the individual, community, the environment and society in which people live. Provision of information in isolation is ineffective; actions are needed which facilitate and encourage change. To address the needs of the poorest effective interventions need to tackle the broader determinants of health, including social exclusion, social cohesion, environmental, and structural factors.

Everyone has a part to play in improving dietary and physical activity patterns: health care professionals, schools, employers, farmers, food manufacturers, retailers, caterers, the media, local and national government, the EU and of course consumers themselves.

One of the most easily transferable frameworks for the development of public health strategies attempts to capture the individual, community, environmental and policy levels, by working through '**target groups**' (e.g. the elderly, minority ethnic groups, pregnant women, adolescents, the disabled, and those on low incomes), '**settings**' (e.g. workplace, schools, commercial sector, and the health sector), and '**approaches**' (e.g. the use of mass media, community development, environmental change, and policy and infrastructure change).

The Eurodiet project has suggested outline strategies for each of the key target groups, settings and approaches that it has identified as having the potential for maximum reach and influence in working towards dietary guidelines, including increasing fruit and vegetable consumption, initiation and duration of breast-feeding, and levels of physical activity. For example possible approaches in different settings are given below: -

Health care professionals are in a key position to influence both their patients and their communities. Systematic reviews indicate that interventions in health care settings have a moderate but important effect on the risk factors for the major degenerative diseases. However there is a need to improve health professionals' training in public health nutrition, and place more emphasis on prevention as well as treatment.

Schools provide a valuable opportunity to influence the dietary habits of young people at an influential stage in their life. The most effective initiatives in schools adopt a whole school approach where teaching about food, nutrition and physical activity is closely integrated with provision of healthy food and facilities for physical activity, and involves both families and the wider community.

The Workplace has considerable potential to improve the health of the adult population because people spend a large proportion of their time at work and often eat there. It also has a role in enabling breast-feeding women to return to work, if they wish to do so. Effective workplace interventions need to be supported by both employers and employees.

Research on the effectiveness of interventions through the Commercial Sector is scant. However manufacturers and retailers, whether they are large companies or small, could support broader strategies through changes in production, pricing, marketing and labeling of foods. The catering sector has an important role to play, with the growing tendency for people to eat their meals outside of the home. The evidence indicates that the most effective way to enable dietary change is passive alteration of the nutrient content of meals by caterers, rather than marketing 'healthy choices'.

Detailed recommendations are given to support the development of public health nutrition strategies in EU member states, and supported by the EU itself. In addition to those which are referred to above, these include: -

- Member countries should encourage the development, implementation and evaluation of nutrition and physical activity public health strategies which are tailored for the cultural and health needs of their populations.
- Both at EU and Member State level more research should be encouraged which will enable good quality data cost benefit analyses
- Monitoring systems are needed to measure mortality and morbidity, attitudinal, lifestyle, social and environmental factors, consistently across the EU and within member states.
- Encouragement should be given by Member States, and relevant sectors within them, to evaluate interventions and publish the results.
- Nutrition and physical activity strategies should be developed for specific population groups, particularly those that are vulnerable or hard to reach.
- Establish public health nutrition training networks and structures at both EU and member state level.
- In Schools: - Implement a curriculum for nutrition and physical activity education from pre-school to secondary schools; integrate school meals in the educational process; provide training for teachers: involve School Health Services in the planning and implementation of programmes to promote healthy eating and physical activity; create a friendly school environment which contributes to making healthy food choices and physical activity easily available; encourage family and community involvement in school nutrition education and physical activity programmes
- In Health Care: - Provide training for health professionals in the skills and knowledge to develop and implement locally relevant interventions; provide support at a national and professional level for health professionals to participate in broader community programmes which tackle the underlying determinants of health; establish a European health professionals' forum to enable communication and co-ordination.
- In the Workplace: -Employers should be encouraged and supported in developing interventions which include: management support; employee involvement; a focus on specific risk factors; tailoring to suit the needs of the work force; making best use of local resources; and which employ both population based, and individual initiatives.
- The Commercial Sector is in a key position to contribute towards an environment that encourages and supports changes towards more healthy eating patterns for example

through pricing structures, product formulation, labelling initiatives, and partnership working with the health sector. It is urged to explore ways in which it can do this.

- Advocacy is a useful approach to bring about structural and social changes, and to raise issues on the political and media agenda, and needs to be supported.
- Local food projects are often an expression of the direct needs of the community, and should be encouraged. For them to succeed it is important to have national and local policies which are flexible enough to accommodate and support them; access to long term funds; relevant professionals need sufficient time, resources, flexibility and authority to work in genuine partnership with local people; there needs to be access to local and national networks, and to sources of training for both professionals and members of the community.
- Finally : in order to develop co-ordinated, multi-sectoral and population wide strategies, identifiable structures and mechanisms are needed at a national level. Member States are urged to give careful consideration to establishing or strengthening intersectoral food, nutrition and physical activity councils, or installing mechanisms to secure better co-ordination between different ministries.

4. People & Policy

The European Policy Framework: Barriers and Opportunities

The Eurodiet Project examined **barriers to, and opportunities for, policy changes at a European Union (EU) level**, that might lead to the improvements in diet and lifestyles.

The Eurodiet Project concludes that Community action in the field of public health has, to date, taken insufficient account of the importance of nutrition, diet and physical activity as a health determinant. There has been some action - particularly in the area of health monitoring and research - the development of the Data Food Networking (DAFNE) project, support for the European Prospective Investigation into Cancer and Nutrition (EPIC Study) etc. - and some in the area of professional development such as the funding of the European Masters Programme in Public Health Nutrition but generally this action has been limited.

It is increasingly recognised that all Community policies and activities might have an impact on health though their effects on diets and lifestyles. Some Community policies - particularly consumer protection policies in relation to the composition, labelling and marketing of food and agriculture policy might currently and/or potentially have a huge impact, but whether or not this is so is uncertain because of a lack of comprehensive and systematic **health impact analyses**.

Structures

Article 152 of the Amsterdam Treaty now creates the basis for action on the part of the European Community aimed directly at promoting health through improving diets in Europe and for ensuring that the improvement of diets should be an aim of all Community policies and activities.

A primary reason for the lack of previous attention paid to nutritional and dietary issues at a European level has been the lack of a high-level committee concerned with nutrition. The Eurodiet Project accordingly recommends the creation of a new European Standing Committee on Nutrition to:

- a) give independent scientific and policy advice on food, nutrition and health to the Commission including advice upon:
 - (i) possible EU action directed towards improving diets and lifestyles;
 - (ii) the indirect effects of EU policies on diets and lifestyles;
- b) oversee future developments in the production of population dietary goals (subsequent to the completion of the Eurodiet Project);
- c) co-ordinate the monitoring of nutrition, diets and lifestyles across the EU including the production of a report, preferably every four years, on the state of nutrition, diet and lifestyles in the European Union.

The new committee - to be effective would need to be supported by a strengthened Nutrition Unit within DG SANCO.

Policy Components

The White Paper on Food Safety has identified a need for a comprehensive and coherent nutritional policy for the EU. A pre-condition of such a policy is comparable data on diet-related health indicators including nutrient and food intakes across Europe. There is therefore an urgent need for harmonised methods of nutritional and dietary surveillance in the EU.

EU action aimed at directly improving diets and lifestyles needs to ensure that it adds to, rather than duplicates, action taken at a national or local level. This is particularly the case in relation to dietary goals and guidelines. Dietary guidance for individuals needs to be culturally appropriate and therefore should be developed and delivered at a national or regional level. However, the Community could play a critical enabling role through agreeing dietary goals for populations (particularly dietary goals for the EU as a whole) such as those specified in Table 1 above; through supporting the further development of evidence based dietary goals for populations; and through continued support for networks whose members are involved in developing and delivering food based dietary guidelines and/or training professionals about nutrition, diets, physical activity and health.

The Commission could also make a critical enabling contribution to the promotion of healthy diets and increased physical activity in Europe through the better regulation of health and nutrition claims, ensuring that consumers are supplied with more comprehensive and comprehensible information about the nutrient content of foods, and the harmonisation of rules on food fortification and food supplements.

Particular components of an EU nutrition policy include :

- Breast feeding: a review of EU policy on breast feeding is called for, including re-evaluation of existing Community legislation on breast milk substitutes and maternity leave.
- Physical activity: a policy for promoting physical activity in Europe should be part of, or at least closely integrated with, the European Community's proposed nutritional policy.
- Fruit and vegetable consumption: the promotion of increased fruit and vegetable consumption across Europe should be a key aspect of the European Community's proposed nutritional policy.

However the primary objective of an EU nutrition policy should be to ensure that the improvement of diets and levels of physical activity should be an aim of all Community policies and activities - in particular - of the Common Agriculture Policy. This will require the development of better methods of health impact assessment in relation to Community policies – and in particular of CAP – and the regular and systematic application of health impact assessment to Community policies.

Those wishing to pursue in greater depth general issues or particular themes raised in this core report are referred to two publications on (a) the EURODIET Reports and Proceedings and (b) the EURODIET Evidence . Public Health Nutrition Vol 4. 2(A) and 2(B).2001. The Working Party reports are also currently available on the project web site <http://eurodiet.med.uoc.gr>
