

4. Policies and strategies

WHO Action Plan on Food and Nutrition Policy

In September 2000, the WHO Regional Committee for Europe, representing the 51 Member States in the European Region, unanimously endorsed a resolution to implement The First Action Plan for Food and Nutrition Policy (Annex 1). The Action Plan makes the case for combining nutrition, food safety and food security and sustainable development into an overarching, intersectoral policy and offers support to governments in developing, implementing and evaluating such policies.

Progress with its implementation, by both WHO and Member States, will be regularly reported to the Regional Committee. In addition, a ministerial conference on food and nutrition will review more comprehensive evaluations of its impact.

This political commitment gives public health experts an extraordinary and important opportunity to advocate, at both the national and European levels, a food and nutrition policy that explicitly promotes health.

The Action Plan stresses the need to develop food and nutrition policies that protect and promote health and reduce the burden of food-related disease, while contributing to socioeconomic development and a sustainable environment. It insists on the complementary roles played by different sectors in formulating and implementing such policies. It provides a framework within which Member States can begin to address the issue. The framework consists of three interrelated strategies (Fig. 4.1):

- a nutrition strategy, geared to ensuring optimum health, especially among low-income groups and during critical periods throughout life, such as infancy, childhood, pregnancy and lactation and older age;
- a food safety strategy, highlighting the need to prevent both chemical and biological contamination at all stages of the food chain (new food safety systems that take a farm-to-fork perspective are being developed); and
- a strategy on a sustainable food supply (food security), aiming to ensure that enough food of high quality is available while helping to stimulate rural economies and to promote the social and environmental aspects of sustainable development.

Fig. 4.1. Framework of The First Action Plan for Food and Nutrition Policy, WHO European Region, 2000–2005



Nutritional imbalances have subtle and long-term effects, as shown in Chapter 1, and place a heavy burden on health and economic progress. The effects of nutrition are not as newsworthy as high-profile food safety crises, and in theory individuals have substantial control over their longer-term nutritional health. Thus, most policy-makers mistakenly consider that individual food choice, stimulated by appropriate educational initiatives, is the key to nutritional wellbeing.

Food safety usually concerns immediate effects on health that often have tremendous political, economic and strategic significance. Health ministers in Europe were heavily involved in reassessing food safety strategies in the 1990s (see Chapter 2, pp. 103–104).

Food and nutrition security has traditionally been important only when food supplies are threatened, for example, by war or drought. As a result of the increased recognition of the importance of environmental conditions, however, environmental policies relating to land use and food supply have a profound long-term impact on both the availability and quality of food.

This chapter considers how best to address all three issues and how to ensure that policies relating to one sector do not conflict with, but support, the needs of the others.

Need for integrated and comprehensive food and nutrition policies

A strong case can be made for developing national food and nutrition policies that address all three areas – nutrition, food safety and food security – since

these political commitments overlap and since such an integrated approach can help to prevent the inadvertent development of potentially damaging policies. A written policy brings the following benefits (1); it:

- sets out a clear statement of intent, legitimizes action and provides a firm foundation for food and nutrition initiatives;
- creates a framework for action for the health ministry and other sectors;
- removes any possibility of misinterpretation or misunderstanding of the government position on food and nutrition and any differences in interpretation between the sectors involved;
- provides a corporate document to which individuals and organizations can refer;
- demonstrates commitment to the public health of all citizens;
- justifies the allocation of resources to national plans and programmes on food and nutrition.

Discordant agricultural, industrial and food policies can harm health, the environment and the economy, but harmful effects can be reduced and health promoted if all sectors are aware of the policy options. The following sections give examples of the disadvantages of discordant policies and the advantages of concordant ones.

Policy discordance

CAP – multiple health effects

EU regulations on agriculture, industrial practice and taxation significantly affect the pricing of and policies on food throughout the world. The EU is the biggest importer and exporter of food in the world. Its criteria for food safety and the nutritional quality of different products and the policies relating to any selective promotion of specific foods therefore profoundly affect not only the EU itself but any country that exports or imports an appreciable part of its food supply. Owing to the expansion of the EU, its policies also profoundly affect the accession countries. The directives relating to food labelling, food safety, demands for specific agricultural and slaughtering practices in the animal food chain and the taxation systems relating to the support of less economically advanced areas within the EU affect the nature of the food supply and ultimately people's health.

An analysis by Sweden's National Institute of Public Health (2) concludes that the regulations and systems involved in CAP have led to effects on consumption that can harm health. Consumer groups have performed similar analyses and reached similar conclusions (3) (see Chapter 2, pp. 169 and 183–184).

For instance, CAP rules on fruit and vegetables raise the price of fresh fruit and vegetables, preventing low-income people from affording healthy food. In

addition, subsidies of products containing milk fat and the promotion of full-fat milk conflict with the health aim of reducing saturated fat intake. CAP therefore does little to reduce the high rates of CVD within the EU. The “yellow fat regime” has kept the retail price of butter well above the world market price, however, so this could help to reduce saturated fat intake. Further, regulation of the wine market removes surplus production and keeps prices higher than the world market. This tends to limit the consumption of wine, although there is major pressure for allowing greater wine consumption, which would not be beneficial. The report from the National Institute of Public Health, Sweden, puts forward a number of specific recommendations that would lead to substantial improvements in the CAP from a public health point of view. Some important ones are (2):

- Phase out all consumption aid to dairy products with a high fat content.
- Limit the School Milk Measure to include only milk products with a low fat content.
- Introduce a similar school measure for fruits and vegetables.
- Redistribute agriculture support so that it favours the fruit and vegetable sector and increased consumption.
- Phase out support for the promotion of wine consumption.
- Improve and put a time limit on the support to farmers who wish to cease wine production.
- Develop a plan to phase out tobacco subsidies within a reasonable time.

BSE crisis: driven by cost-cutting feeding practices

The BSE crisis in the European Region (see Chapter 2, pp. 125–127) illustrates the importance of considering any potential health effects of agricultural and industrial practices. The advantage of including recycled animal protein in ruminant diets is that cattle and sheep respond especially well in production terms. The resulting widespread use of animal protein, whether from fish or recycled meat and bone meal, led to marked increases in productivity and increasingly inexpensive meat and milk supplies. This was considered important for health after the Second World War, as the nutritional wellbeing of the poor would be improved at that time if children and nursing mothers had access to inexpensive meat and milk.

The crisis in the United Kingdom, which began with the discovery of BSE in cattle in 1986, escalated when BSE was linked to vCJD. BSE has now affected all EU countries, and many others, such as Switzerland and Japan, with profound economic implications and the demand for ever more rigorous food safety measures. Based on a recent classification of the risk of BSE in many countries throughout the world, the EU now requires a substantial number of countries to institute slaughtering policies that specify the removal of the

brain, spinal cord and often the vertebral column of animals. This is to exclude from the food chain as much as possible any potential infectivity with transmissible spongiform encephalopathies. The crisis has also necessitated changes in policies relating to the use of vaccines, medical implants and a range of other surgical procedures. It is still uncertain whether the disproportional impact of vCJD on young people is a feature of their age-related biological sensitivity or the incubation period of the disease is shorter in young people (4).

Labelling of meat

An EU directive from 2000 (5) contains a set of new provisions to improve consumer information on prepacked meat products such as cooked meats, prepared dishes and canned meat. The previous EU definition of meat made no distinction between muscle-meat, fat and offal, while consumers usually perceive meat to mean muscle-meat. The existing system was therefore unsatisfactory, and several EU countries had already adopted their own definitions of meat for labelling. The new EU directive restricts the definition of meat to muscle-meat. Other parts – such as offal, heart, intestine, liver and fat – will now have to be labelled as such.

Nevertheless, a nutrition policy concern remains because this directive permits fat adhering to the muscle and comprising 25% or less of total weight to be called meat. This figure rises to 30% for pork products (5). To help consumers reduce saturated fat intake, public health experts should therefore take the necessary intersectoral steps to ensure that meat has a much lower fat content. Without both clear labelling and more stringent definitions of meat, consumers cannot make informed choices on how to eat a healthier diet.

Promotion of olive oil

Olive oil has been advocated as beneficial to health because it is relatively high in monounsaturated fatty acids and has limited saturated fat. It is traditionally linked to the Mediterranean diet, with its beneficial health effects. Industrial and farming groups in Mediterranean regions that need economic development are therefore heavily promoting olive oil. Olive oil may indeed be conducive to health, especially if it replaces other saturated fat. Alternative plant oils such as rapeseed oil are also being produced, so there is no intrinsic need to promote olive oil alone.

Current EU policies to promote olive oil production and consumption, however, have led to much of the global supply being produced in Greece, Italy, Portugal and Spain. This in turn has led to intensification of production, resulting in severe soil erosion and a remarkable decline in water availability. Thus, intensive agriculture, geared to increasing olive oil production subsidized by the EU, is threatening the long-term viability of these olive-producing

areas (6–9). Statistics from FAO show that olive oil production doubled in the EU (the current 15 EU countries) from 1990 to 2001: from 1 025 572 metric tonnes to 2 045 300 tonnes (<http://apps.fao.org/page/collections?subset=agriculture>, accessed 22 January 2003). The recommendations of food and nutrition policy should ensure the sustainability of these food-growing regions.

Fish

The consumption of fish is advocated for its health-beneficial fatty acids. The very-long-chain omega-3 polyunsaturated fatty acids derived mainly from fish are now recognized to have marked favourable effects on CHD and other positive effects on health (see Chapter 1, p. 10). Although eating more fish has clear benefits, European stocks of fish are rapidly declining, a decline accelerated by the escalating world demand. This demand has led to a major drive to increase fish farming. This should be developed further, with a limitation on the use of fish meal as feed, and aquacultural methods should be improved, including limiting the accumulation of toxins such as dioxin (see Chapter 2, p. 113), a fat-soluble carcinogenic compound, contained in omega-3 fatty acids.

Integrated intervention by the nutrition, food safety and environmental sectors is thus warranted. Nutritionists' advocacy of greater consumption of fish must be backed by food safety measures to control dioxin contamination and environmental measures to promote the management of clean bodies of water. A similar dilemma occurs when, on the one hand, low-fat chicken meat is recommended and, on the other, there are food safety concerns about *Salmonella* (see Chapter 2, pp. 121–124).

Food fortification: the case of universal salt iodization

The international policy recommendation for eliminating iodine deficiency is universal salt iodization: depending on salt consumption patterns, all salt used at the table, for cooking and by food manufacturers and all salt fed as fodder to animals should be iodized. In some countries, only table salt is iodized. This may lead to the unintentional promotion of salt, and excessive salt intake can adversely affect blood pressure (10). If consumers reduce their salt intake, as recommended in most dietary guidelines, and if only table salt is iodized, they may become deficient in iodine. Iodine deficiency disorders can be more sustainably eradicated if all salt is iodized. The iodization of animal fodder needs to be explored further because the various approaches to correct iodine deficiency have underestimated it as a component of universal salt iodization.

Universal salt iodization is another example of a policy warranting integrated intervention by nutritionists, food safety experts, the food industry and farmers. Nutritionists should ensure sufficient iodine intake; food safety

experts should monitor the fortification levels of iodine in line with national regulations; the food industry should ensure all salt is iodized, and farmers should ensure implementation of the regulations on iodized fodder in animal husbandry. Consumers should automatically get sufficient iodine from manufactured foods such as bread, without having to add extra salt to their food. In western Europe, about 75% of salt intake comes from salt added to processed foods and only 25% from cooking or table use. Studies show that bread accounts for nearly 25% of the salt in diets in the United Kingdom, although sodium levels in bread were reduced by up to 21% between 1998 and 2001. The Department of Health now wants to see all food industries follow the example set by the bread industry. Sir John Krebs, Chair of the United Kingdom Food Standards Agency, stated: "This change is of real importance for the health of our bread eating nation – particularly for those who have been advised to reduce their salt intake. In the [United Kingdom], people eat on average three slices of bread per day, so this is key to lowering their overall dietary intake of salt." (11).

Pesticide residues in fruits and vegetables

Consumers' exposure to pesticides should be minimized for safety reasons. In the United Kingdom, more than 450 active pesticide ingredients are licensed for use in agriculture (12), and about 25 000 tonnes of pesticides were applied to crops in 2000 (<http://apps.fao.org/page/collections?subset=agriculture>, accessed 22 January 2003). Because many pesticides are persistent, they contaminate air, water and soil. Nearly half (48%) of all fruit and vegetables tested in the United Kingdom in 1999 contained detectable pesticide residues. The maximum acceptable residue limit was exceeded in 1.6% of samples. Although the Working Party on Pesticide Residues (13) reported that most of these residues above maximum limits posed no threat to human health, it found potentially harmful levels in pears and peppers. The threat of accumulation of pesticide residues in the body could discourage consumers from increasing their intake of fruits and vegetables. As discussed in Chapter 1 and in this chapter, nutrition recommendations promote increased intake of fruits and vegetables, to at least 400 g per day (10). Convincing consumers to do this may be difficult if they are concerned about ingesting pesticide residues (see Chapter 2, pp. 129–135).

Policy concordance

Health-driven changes in the food chain: Finland

Finland has managed to decrease CVD dramatically by taking into consideration environmental, industry and dietary concerns (see Chapter 1, Fig. 1.6, p. 15). In the early 1970s, Finland had the highest recorded coronary mortality in the world. A government-led project targeted smoking, blood pressure

control and diet, and started preventive activities throughout the country involving the health education and industrial sectors, with changes in the availability and nutritional quality of foods provided in schools, canteens, restaurants and the marketplace. Simultaneously, a market was created for locally produced rapeseed oil to counter the culture of consuming butter and fatty dairy products. The development of a local product ensured its acceptability throughout society and linked to the development of a health-conscious and environment-friendly branch of the food industry.

Consumption of fruit and berries – the latter culturally important in Finland – was also successfully promoted. In addition, vegetable consumption doubled, the proportion of saturated fat in total fat consumption declined and fish consumption rose. This concerted effort to change the whole pattern of eating resulted in a substantial improvement in the health of the whole population. The secret was close integration between health and other agencies. For example, dietary guidelines were designed for schools, other mass-catering institutions and other social groups, including elderly people and the armed forces (14,15).

Industrial and fiscal policies leading to health benefits: Poland

While the initiative in Finland arose from health considerations, in Poland the primary concern was to liberate food producers from economic constraints (see Chapter 1, p. 28). Small private farmers were given greater freedom to market their abundant production of fruits and vegetables in Poland, and the selective taxes on different types of fat were changed. This meant that butter and lard were no longer promoted in preference to other types of fat.

A dramatic reduction in saturated fat intake followed. Freeing the agricultural markets allowed fruits and vegetables to be far more readily available throughout the year. A decline in heart disease in association with these changes was evident within two years. This illustrates the profound effect of nutritional change induced by multisectoral policies on disease rates in Poland.

Local agricultural initiatives: St Petersburg, Russian Federation

As a response to the shortages of basic foodstuffs and environmental problems experienced by people in St Petersburg, the Urban Gardening Club started rooftop gardening initiatives to produce vegetables for people with no access to land outside the city (16). Just one district in St Petersburg can now grow 2000 tonnes of vegetables. Despite growing in a city environment, the vegetables from rooftop gardens proved to have lower levels of contaminants than the usual vegetables sold in the market.

A special feature of the Club is the associated research into techniques for rooftop gardening in urban conditions, such as in residential buildings,

schools, hospitals and other institutions. In addition, the project provides employment training and rehabilitation, providing new skills for people with reduced ability to work.

Such initiatives have many benefits. They promote local economic growth, encourage the production of healthy and safe foods, make environmentally friendly use of otherwise unexploited urban spaces and help to promote social cohesion.

Food safety and the environment: Sweden

Sweden's development of an integrated policy on food and health stemmed from a food crisis. A proactive food hygiene policy (see Chapter 2, pp. 106–107) was introduced following the deaths of about 100 people from salmonellosis in the early 1950s. Sweden set up the National Food Administration and made more effort to link good, safe production with high health standards. The progressive stance of farming organizations in Sweden, as well as pressure for change from consumers and other interests outside the food and agricultural sectors, helped such integration (17).

Sweden's Ministry of Agriculture, Food and Fisheries and its Ministry of the Environment are developing programmes to reduce the use of fossil fuels and meet food safety and environmental targets (18). Sweden is also exploring methods to reduce the amount of greenhouse gases produced during food production, as recommended by WHO, the World Meteorological Organization and the United Nations Environment Programme (19). The country aims to halve resource use by 2021, but current evidence indicated that it is unlikely to meet this target. A comprehensive audit of the consequences of eating and travelling in Sweden has shown that far more energy is used than fits the proposed energy quota. This implies "substantial lifestyle changes" (20). New methods are being developed to improve energy auditing in food systems.

Urban food security: food charter in Toronto, Canada

The Toronto City Council formed the Food and Hunger Action Committee in 1999 following a recommendation made by Hunger Watch (a coalition of emergency food organizations) and endorsed by the city's Millennium Task Force. In July 2000, the Action Committee presented a report to the Council (21) that identified serious food security issues in Toronto:

- 120 000 people (40% of them children) in the greater Toronto area relied on food banks;
- elderly people and families relied on 1 250 000 hot meals served every year;
- half of food bank users ran out of food at least once each week; and
- 20% of residents had too little money to meet their basic food needs.

The City Council unanimously endorsed the report, adopted its recommendations and asked the Action Committee to create a food charter for the city and to present an action plan to improve Toronto residents' access to safe, affordable and nutritious food and to enhance the coordination and delivery of related services.

The Food and Hunger Action Committee developed the action plan, in consultation with a community reference group, based on the following (22).

1. High rents and low incomes imposed hunger on Toronto's poorest residents.
2. Food programmes provided by city and community groups were effective and merited continued support.
3. Existing programmes were not available in all areas of the city. The former suburbs were less likely to have programmes that met local needs, although they had problems as severe as those downtown.
4. Food security initiatives offered the city an opportunity to save money, create jobs, strengthen local communities and stimulate the economy.
5. The volunteer and charitable sector currently provided most of the food relief services, but could not handle the ever-increasing demands for assistance resulting from cutbacks to federal and provincial social programmes.
6. Food security measures could help Toronto to reduce the amount of food and organic material it sent to landfill.
7. Food security measures could be revenue neutral, because food security was both a motivation and a vehicle for the productive use of previously wasted resources, and because it offers the city the opportunity to get full value from underused existing assets.

The action plan is organized according to the roles that the City can play as an advocate to other levels of government, a coordinator of community initiatives, a supporter of access to food through its own programmes and an innovator in using food security initiatives to meet the City's economic and environmental goals (22).

Food and nutrition policies in the European Region

The following sections of this chapter consider policies in the three interrelated parts of food and nutrition policy: nutrition, food safety and food security. Each discusses both existing policies and considerations for the future. Information on existing policies comes from surveys of European Member States' main policies and practices on nutrition, food safety and food security, performed by the nutrition programme of the WHO Regional Office for Europe during 1999–2000 (23–25).

Nutrition policy

Existing policies

In summary, the survey (23), showed that:

- 16 Member States have administrative structures for implementing food and nutrition strategies;
- 28 have a nutrition council or equivalent technical advisory body;
- 36 have national recommended nutrient intake or equivalent tables;
- 27 have national dietary guidelines; and
- 17 collect national data on dietary intake using a variety of methods.

Countries with national coordination bodies for food and nutrition appear to be the most effective in developing and implementing policies. Such a body advises the government on developing, implementing, monitoring and evaluating intersectoral policies and their associated guidelines and action plans. It can also be responsible for ensuring the consistency of information given by different sectors to the public, encourage and respond to public interest about food issues and advise the government on how to meet its international commitments.

Table 4.1 shows the numbers of countries in each subregion that take various types of action on nutrition. Over half the countries in the Region have nutrition councils or bodies that can provide scientific advice to politicians and policy-makers, with the Nordic countries being most fully developed. Less than one third reported having administrative structures to ensure that policy is implemented. Thus, capacity in this area clearly needs to be strengthened.

Two tools a health ministry must have to support nutrition policy development are a set of recommended nutrient intakes and food-based dietary guidelines (23):

Subregion (responding countries/total countries)	Number with recommended nutrient intake values
South-eastern Europe (5/5)	5
Baltic countries (3/3)	2
Central Asian republics (3/5)	3
CCEE (5/6)	4
CIS (4/7)	4
Nordic countries (5/5)	5
Southern Europe (6/10)	5
Western Europe (9/9)	8
Total (40/50)	36

Table 4.1. Number of countries taking government-initiated action to implement and monitor nutrition policy according to subregion, 1999

Subregion (responding countries/total countries)	Number of countries				
	Policy document	Administrative structure to implement policy	Advisory body on technical issues	Regular initiated inter-sectoral collaboration	Regular collaboration between health and agriculture ministries
South-eastern Europe (5/5)	4	2	2	4	5
Baltic countries (3/3)	2	1	2	1	1
Central Asian republics (3/5)	3	2	2	3	3
CCEE (5/6)	4	3	2	4	4
Commonwealth of Independent States (CIS) (4/7)	3	1	2	2	3
Nordic countries (5/5)	4	1	5	3	2
Southern Europe (6/10)	4	4	6	4	4
Western Europe (9/9)	5	2	7	5	6
Total (40/50)	29	16	28	26	28

Source: *Comparative analysis of food and nutrition policies in the WHO European Region 1994–1999. Summary report (23)*.

About half of Member States have developed food-based dietary guidelines (Table 4.2). These can be used to disseminate information to the public and to form the basis of other programmes and policies.

Table 4.2. Number of European countries with national food-based dietary guidelines, according to subregion, 2002

Subregion (countries)	Guidelines?			
	Yes	In progress ^a	No	No answer
Nordic countries (5/5)	5	0	0	0
Western Europe (9/9)	5	1	2	1
Southern Europe (8/10)	6	1	0	1
CCEE (6/6)	5	1	0	0
Baltic countries (3/3)	2	1	0	0
South-eastern Europe (5/5)	2	1	2	0
CIS (7/7)	1	0	1	5
Central Asian republics (5/5)	0	0	1	4
Total (48/50)	26	5	6	11

^a Food-based dietary guidelines being developed or await endorsement by the government.

Source: *Food-based dietary guidelines in WHO European Member States (25)*.

Policy-makers can use dietary targets or goals to monitor and evaluate the population's nutritional health. In addition to considering the results of surveys on dietary intake, health ministries may decide to compare dietary targets with national statistics on agriculture and food supply (see Chapter 3, Table 3.10, p. 187). Table 4.3 summarizes the national population targets for nutrition of governments throughout the European Region. The figures used reflect the range reported by different countries.

Table 4.3. Population goals for dietary recommendations in different countries of the European Region, 2002

Component	Goals
Proportion of total energy intake from:	
• total fatty acids	< 30–35%
• saturated fatty acids	< 10%
• sugar	< 10%
Fruits and vegetables	> 400–600 g per day
Salt	< 5–8 g per day
Body weight	BMI of 18–27
Physical activity	30 min moderate exercise per day
Breastfeeding	4–6 months ^a

^a Many countries are revising their breastfeeding recommendations to 6 months, in accordance with World Health Assembly resolution WHA54.2 (26).

Source: *Food-based dietary guidelines in WHO European Member States* (25).

Considerations for the future

The following sections discuss some of the most important considerations for the future.

Elements of successful policy

A review of WHO food and nutrition policies throughout the world, according to the WHO Global Database on National Nutrition Policies and Programmes (http://www.who.int/nut/db_pol.htm, accessed 8 July 2003), outlined key elements for success and obstacles to development and implementation. Three key elements for successful development of policies are:

1. political commitment (with an influential ministry to lead the process and a high-profile advocate);
2. strong human capacity in nutrition (skills, knowledge, numbers of staff); and
3. availability of reliable national data on food, nutrition and health.

Common obstacles to developing national nutrition plans are:

1. low priority given to nutrition by governments;
2. lack of intersectoral coordination;
3. lack of local experts;
4. political instability; and
5. lack of reliable data on food and nutrition.

Five key elements for successful implementation of national food and nutrition plans and policies are:

1. official government adoption and political support, including government funds specifically allocated to nutrition;
2. an intersectoral coordination mechanism, located in the government and allocated a budget;
3. priorities set for activities and responsible sectors or ministries designated;
4. ability to translate plans into action, including strengthening human capacity in designing and planning programmes for nutritional improvements;
5. a mechanism for monitoring and evaluation.

Obstacles to policy implementation are the lack of: political commitment, at both the national and local levels; technical expertise; and funding.

Recommendations, goals and guidelines

In addition to political commitment and a focused approach, specific recommendations are required to achieve active consultation with stakeholders. As mentioned above, national recommended nutrient intakes, developed by health ministries, are essential; Annex 2 lists international and selected national recommendations. Fourteen European Member States, especially NIS, did not report having national recommended nutrient intakes (24). These countries may wish to compare or update their existing recommendations with those presented in Annex 2.

Establishing recommended nutrient intakes is a difficult scientific process because many issues should be considered. For example, how much of each nutrient is needed to maintain optimal health, and is it sufficient to prevent signs of clinical deficiency, such as prevention of anaemia in the case of iron intake. Moreover, the fact that excessive consumption of some nutrients may be harmful needs to be considered. How can policy-makers ensure that single values cover the wide range of individual variation in, for example, energy needs? Other factors, such as the bioavailability of nutrients, affect the difference between what a specific person needs and the value adopted to safeguard most of the population against nutrient deficiency.

Owing to these complex scientific issues, most countries are unable to establish their own national norms and standards. WHO and FAO therefore develop international standards that countries can adopt. These standards are relevant to healthy populations, not to sick people or to individuals. The recommendations can be used as a planning tool, to decide on the quantities of foodstuffs needed for national populations and for nutrition labelling. Different countries use different names for recommended nutrient intake – such as reference nutrient intake, population reference intake, physiological norms or recommended daily allowance – but they all have the same role.

After establishing national recommended nutrient intakes, health ministries should establish nutrient goals for their population. Table 4.4 outlines European nutrient goals that are in line with the outcome of an expert consultation held by WHO and FAO in 2002 (10). These goals are very important in establishing specific targets or benchmarks against which dietary intake can be assessed and monitored. They set a direction and display the extent of change necessary to achieve good health in the population. They also provide a lead for health promotion programmes and a focus for policy development. The sectors that should be involved can be more easily identified and responsibilities allocated to the appropriate change agent. Since health care resources are limited, priorities must always be set, and national goals can help to allocate resources to the areas identified as most important.

To be understood, nutrient population goals need to be translated into food-based dietary guidelines at the national level (29). The health ministry should endorse dietary guidelines that are consistent and easily understood. Many primary care experts and other health specialists, such as paediatricians, obstetricians and cardiologists, have opportunities to give advice on healthy eating. There are at least 26 examples of national dietary guidelines in the Region (Table 4.2). Some examples are based on the *CINDI dietary guide* and its 12 steps to healthy eating (30), developed by the WHO Regional Office for Europe:

1. Eat a nutritious diet based on a variety of foods originating mainly from plants, rather than animals.
2. Eat bread, grains, pasta, rice or potatoes several times a day.
3. Eat a variety of fruits and vegetables, preferably fresh and local, several times per day (at least 400 g per day).
4. Maintain a body weight between the recommended limits (a BMI of 20–25 [adapted from the global WHO recommendation of 18.5–24.9 as normal values]) by taking moderate levels of physical activity, preferably daily.
5. Control fat intake (not more than 30% of daily energy) and replace most saturated fats with unsaturated vegetable oils or soft margarines.

6. Replace fatty meat and meat products with beans, legumes, lentils, fish, poultry or lean meat.
7. Use milk and dairy products (kefir, sour milk, yoghurt and cheese) that are low in both fat and salt.
8. Select foods that are low in sugar, and eat refined sugar sparingly, limiting the frequency of sugary drinks and sweets.
9. Choose a low-salt diet. Total salt intake should not be more than one teaspoon (6 g) per day, including the salt in bread and processed, cured and preserved foods. (Salt iodization should be universal where iodine deficiency is endemic.)
10. If alcohol is consumed, limit intake to no more than two drinks (each containing 10 g of alcohol) per day.
11. Prepare food in a safe and hygienic way. Steam, bake, boil or microwave to help reduce the amount of added fat.
12. Promote exclusive breastfeeding and the introduction of safe and adequate complementary foods from the age of 6 months while breastfeeding continues during the first years of life.

Table 4.4. Population goals from recent international expert analyses and levels of evidence

Component ^a	Population goals	Levels of evidence ^b
Physical activity level	> 1.75 ^c	A
Adult body weight	BMI of 21–22	A
Proportion of total energy intake from:		
• total fatty acids	< 30%	A
• saturated fatty acids	< 10%	C
• <i>trans</i> -fatty acids	< 2%	A
• polyunsaturated fatty acids:		
– omega-6	< 7–8%	A
– omega-3	2 g/day of linolenic + 200 mg/day of very-long-chain	A
• carbohydrates	> 55%	B
Sugary foods	4 occasions/day ^d	A
Fruits and vegetables	> 400 g/day	A
Folate from food	> 400 µg/day	B
Dietary fibre	> 25 g/day (or 3 g/MJ of energy intake)	A
Sodium as NaCl	< 6 g/day	B
Iodine	150 µg/day (infants: 50 µg/day; pregnant women: 200 µg/day)	B
Exclusive breastfeeding	About 6 months	B

^a The source report includes goals for other important nutrients, such as iron, calcium, alcohol, water and vitamin D.

^b Levels of evidence are based on those used in several guideline systems, such as the Cochrane system, the US National Academy of Sciences scheme and the systems used in assessing diet in relation to cancer by the World Cancer Research Fund and American Institute for Cancer Research (27) and expert bodies in Member States. These other systems

are included because undertaking double-blind placebo-controlled studies is often more difficult for dietary research than drug trials. Thus, the best evidence is considered as convincing by these expert groups when meta-analyses of different types of study are integrated but are nevertheless classified as either ecological analyses compatible with non-double-blind intervention and physiological studies or only integration of multiple levels of evidence by expert groups. These trials and other analyses do not prove that only the precise values in the table are correct, but that the evidence from dietary change or differences supports them.

^b A = ecological analyses compatible with non-double-blind intervention and physiological studies; B = single study of double-blind analyses or, for breastfeeding, a series of non-double-blind analyses; C = multiple double-blind placebo-controlled trials.

^c Ratio of total daily energy expenditure to basal metabolic rate.

^d An occasion includes any episode of food and drink consumption during the day. This limited intake is compatible with many EU member states' limits on total sugar intake and the Nordic concern to limit the intake by children and those adults on low energy intakes to no more than 10% of total energy.

Source: adapted from EURODIET Working Party 1 (28).

Food-based dietary guidelines must be adapted to a country's needs, ensure that the nutrient needs of the population are covered and help to reduce the risk of CVD and cancer (see Chapter 1). They should also be in accordance with public policies that promote food safety and a healthy environment and a robust local food economy.

Recommendations vary between countries according to the availability and cultural acceptability of foods. For effective implementation, dietary guidelines must take account of dietary patterns and the prevalence of both deficiency disorders and noncommunicable diseases in each country. Health professionals should review the data on premature mortality, morbidity and diet and nutritional status before developing their own dietary guidelines. This will ensure that the recommendations are tailored to national conditions.

Posters or food selection guides should accompany dietary guidelines, to help people select a diet that is adequate in nutrients, contains a high level of complex starches, dietary fibre and fruits and vegetables and that avoids excessive intake of fat, salt and added sugar.

Food selection guides should promote food choices that are consistent with the conservation of national resources, which includes promoting local production for local consumption. A food guide should be culturally inclusive and incorporate foods that are generally available and accessible at a reasonable price. It should also be based on sound educational principles and be comprehensible to people with a wide range of educational levels in communities.

Promoting physical activity

National guidelines should include the promotion of physical activity (see Chapter 1, pp. 38–40), as stated in step 4 of the 12 steps to healthy eating (30). Because health professionals are a trusted source of information, they

can promote healthy nutrition and physical activity to patients and the wider community. Governments and health professionals can promote physical activity to adults by:

- developing guidelines for counselling on exercise
- raising the awareness of health care staff
- developing specifications for health-related physical activity.

The physical activity level is the ratio of total daily energy expenditure to basal metabolic rate. A physical activity level of 1 would involve no physical activity, and the energy required would simply go to maintaining the basal metabolic rate. EURODIET's population goal of a physical activity level of at least 1.75 (Table 4.4) is equivalent to walking 60–80 minutes each day and is more than the 30 minutes recommended for heart health (24). This is based on needing to be more physically active to avoid weight gain on high fat intake; sedentary societies probably need a lower fat intake, such as 20–25% of total energy, to avoid excessive weight gain. Moderate weekly exercise reduces morbidity rates by 30–50%.

Raising physical activity levels is one of the most important goals for public health in the European Region because it has such a strong effect on the risk of CVD and because activity levels in the population are so low. Inadequate physical activity is more common than any of the classic risk factors for chronic diseases: smoking, hypertension, high blood cholesterol and overweight. The proportion of CVD incidence that more physical activity in the European population could theoretically prevent – the population-attributable risk – is estimated to be about 30–40% (31).

Health-enhancing physical activity (32) is any form of activity that benefits health and functional capacity without undue harm or risk. Physical activity does not need to be strenuous to be effective. At least 30 minutes a day of moderate-intensity activity is enough to benefit health. The choice of activities is ample and includes (33): brisk walking, cycling, swimming, dancing, cross-country skiing, gardening, mowing the lawn, walking the dog, washing windows or a car, shovelling snow and walking to work or shops.

WHO has developed guidelines to encourage increased physical activity as part of regular daily living (34). The aim is to make daily physical activity an easy choice and thus to prevent obesity, reduce the risk of diabetes and CVD, and promote good health and wellbeing.

In 1996, the EC created the European Network for the Promotion of Health-enhancing Physical Activity, which aimed to facilitate the development of national policies and strategies (35). Major national initiatives, strategies or programmes promoting health-enhancing physical activity have been developed and are being implemented in the Scandinavian countries, the

Netherlands, Switzerland and the United Kingdom, and similar preparatory work is in progress in most other EU countries and in some non-EU countries. The European Commission has also published a review of its activities in nutrition (36).

Preventing CVD and cancer

Eating a diet low in saturated fat and high in fruits and vegetables, taking regular exercise and not smoking can help to prevent premature mortality from CVD and cancer.

Significantly reducing dietary saturated fat, getting plenty of aerobic exercise and losing weight are also good ways of reducing serum cholesterol levels (see Chapter 1, p. 25–27). In addition, appropriate intake of salt is important in controlling blood pressure. Several diets have been developed specifically to control hypertension. For example, DASH (37) is a combination diet: low in saturated fat and rich in fruits and vegetables: high dietary fibre, potassium, calcium and magnesium (see Chapter 1, pp. 29–30).

DASH includes more than 600 g per day of fruits and vegetables, especially those high in potassium and magnesium. Low-fat dairy products contribute calcium and protein; whole grains from cereals, breads and crackers contribute fibre and energy. Intake of lean meat, poultry and fish is moderate: less than 150 g per day. To boost potassium, fibre, protein and energy even more, DASH recommends nuts, seeds, and cooked dried beans 4–5 times per week.

The original study, with 454 subjects, showed that the systolic blood pressure of hypertensive patients complying with DASH declined by an average of 11.4 mmHg and diastolic blood pressure by 5.5 mmHg. These results occurred without medication, from losing weight and reducing sodium intake (37). The benefit of the DASH diet is that, in addition to reducing hypertension, it is the same as the diet recommended to prevent CVD, cancer, diabetes and overweight.

Preventing overweight and obesity

Comprehensive strategies have not yet been developed to address the problem of overweight and obesity among adults and children at a population level (see Chapter 1, pp. 35–38). Governments must develop stronger approaches to nutrition and physical activity that require coordinated intersectoral commitment at all levels, rather leaving the task to health policy alone. Too often policy-makers assume that personalized health education is the only way to help.

The huge interest in slimming, the vast market for slimming foods and other aids to weight reduction, alongside escalating rates of overweight and obesity, show that this approach is failing. WHO has launched a new Global

Strategy on Diet, Physical Activity and Health. Descriptions of the Strategy and the consultation process completed in 2003 are available on the Internet (www.who.int/hpr/gsc/consultation.document.shtml, accessed 3 September 2003). The European Region needs to develop broader, more coherent policies to counteract similar pressures now affecting widespread populations (38). Obesity in children is causing particular concern and recommendations have been developed (39,40) (see pp. 248–249). BMI charts for children from birth up to 20 years for boys and girls have been developed in Germany, France and United Kingdom (http://www.healthforallchildren.co.uk/acatalog/HFAC_Catalogue_BMI_Charts_5.html, accessed 3 September 2003).

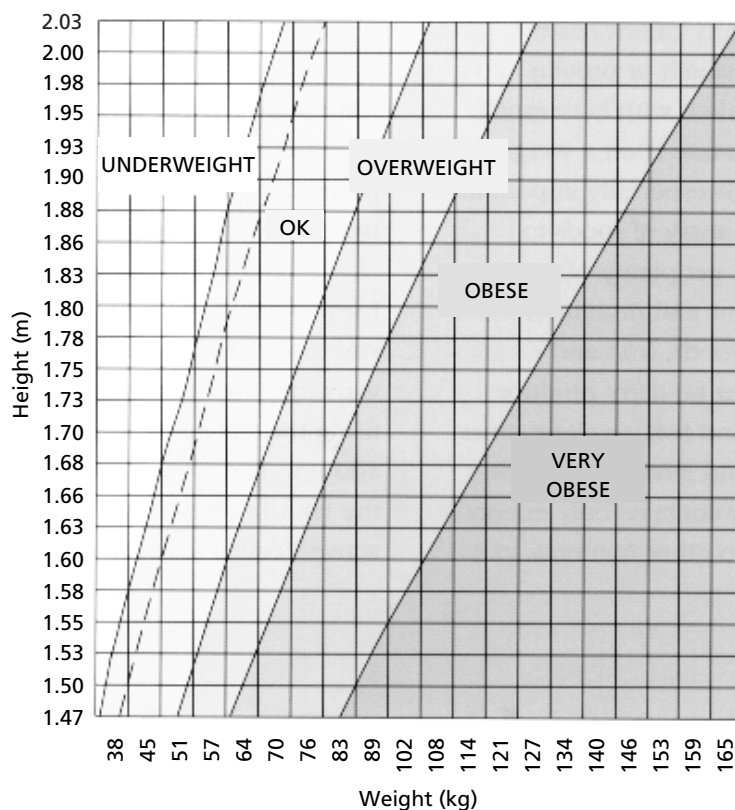
The *CINDI dietary guide* (30) provides advice on weight control, and the ideal adult body is accepted as having a body mass index (BMI) of between 18.5 and 24.9 (41) (Fig. 4.2). People who are underweight (BMI under 18.5) may need more food, which should be part of a well balanced and nutritious diet. Those with very low weight should consult a physician. People whose BMI is 18.5–24.9 are eating the right quantity of food to maintain weight in the desirable range for health, but should make sure there is a healthy balance in the diet. People at the lower end of the weight range should maintain their weight and not be tempted to aim for the underweight category. Some loss of weight would benefit the health of overweight people, and it is an important task for obese people, in view of the risk from further weight gain. Being very obese could seriously affect health and wellbeing. People with a BMI over 40 need to lose weight urgently, and should consider consulting a physician or dietitian (30).

Moreover, how fat is distributed within the body, measured by waist circumference, confers additional risk. The risk of developing type 2 diabetes, hypertension and CHD is much greater in people with excess fat in the abdominal area (upper-body obesity or an apple shape) compared with the hips and thighs (lower-body obesity or a pear shape). Waist measurement is therefore very useful for indicating who is most at risk of metabolic complications, and appears to be even more predictive than BMI.

The risk of metabolic complications associated with obesity increases with a waist circumference over 95 cm among men and 80 cm among women (corresponding approximately to overweight), and the risk increases substantially if the waist is over 100 cm among men and 90 cm among women (corresponding approximately to obesity) (41).

WHO has published detailed recommendations for preventing and managing obesity (38). These emphasize the need for early prevention to ensure lifelong healthy eating and physical activity patterns and the need for coordinated partnerships involving governments, communities, the mass media and the food industry to ensure that diet and everyday levels of physical activity can be changed effectively and sustainably.

Fig. 4.2. BMI chart



Source: adapted from *Eight guidelines for a healthy diet* (42).

At the end of 2001, the Surgeon General of the United States called for sweeping changes in schools, restaurants, workplaces and communities to help combat the growing epidemic of obesity in the country (43). In outlining the first national plan of action in the United States, he recommended improving school lunches, restricting the vending machines that provide students with ready access to energy-dense foods and soft drinks, and resuming daily physical activity classes for all children and adolescents. The report advises that restaurants and fast-food outlets, which account for 40% of food expenditure in the United States, should provide more nutrition information, for which consumer groups have long lobbied. It also outlines changes to improve healthy eating and exercise at work, and urges employers to include counseling on weight management and physical activity as part of health insurance coverage. In 2003, the National Board of Health of Denmark published recommendations to combat obesity and to increase levels of physical activity

(http://www.sst.dk/publ/publ2003/National_action_plan.pdf, accessed 3 September 2003).

Preventing diabetes

Avoiding overweight can reduce the risk of developing type 2 diabetes. Appropriate lifestyle measures are especially important for those with a familial predisposition to diabetes. Regular moderate physical activity and a healthy diet (reducing saturated fat and increasing fruits and vegetables) facilitate weight and weight maintenance. Physical activity may have an independent beneficial effect by reducing resistance to the action of insulin (44).

Preventing undernutrition in hospital patients

A report from the Council of Europe (45) recommends five measures against undernutrition among people in hospitals.

First, responsibilities in planning and managing nutritional care should be clearly defined. Standards of practice for assessing and monitoring patients' nutritional risks and status should be developed at the national level, and the responsibility for these tasks clearly assigned. The hospital's responsibility for the nutritional care and support of patients should not be limited to their hospital stay.

Second, the educational level of all staff groups in general needs improvement. Specifically, a continuing education programme on general nutrition and techniques of nutritional support for all staff involved in the nutritional care of patients should be available, with a focus on training non-clinical staff members and defining their responsibilities.

Third, patients should have the chance to be more involved in decisions about their nutritional care. The provision of meals should be individualized and flexible, and all patients should be able to order food, including extra food, and be informed about this option. Patients should be involved in planning their meals and have some control over food selection. This should include the possibility of immediate feedback from their likes and dislikes of the food served, and the use of this feedback to develop appropriate menus for particular target groups. Patients should be informed about the importance of good nutrition for successful treatment before admission and at discharge.

Fourth, different staff groups should cooperate better. Hospital managers, physicians, nurses, dietitians and food service staff should work together towards the common goal of optimal nutritional patient care. Hospital managers should give priority to cooperation by, for example, initiating organizational research to optimize cooperation. In addition, organized contact between the hospital and the primary health care sector should be established.

Fifth, hospital managers should be involved. They should see the provision of meals as an essential part of treatment, not a hotel service. They should

acknowledge responsibility for food service and the nutritional care of patients and give priority to food policy and management of the services. When assessing the cost of food services, they should take account of the costs of complications and prolonged hospital stay due to undernutrition.

In addition, further research is needed to improve nutritional care and support in hospitals:

- developing and validating simple screening methods for use in hospitals and primary health care, and simple food-recording methods;
- determining the effect of nutritional support on both nutritional status and clinical outcome (including physical and mental functioning: quality-of-life measures), and the effect of energy- and protein-dense menus on food intake and patient outcome;
- determining methods of ensuring patients' intake of ordinary hospital food and assessing patient satisfaction; and
- determining the influence of food service practice on food wastage.

In recent years, increasing numbers of successful initiatives to improve nutritional practices have been documented from all over the Region. It therefore seems the right time to combine the experience gained in a common struggle to ensure that patients have adequate food intake and to prevent disease-related undernutrition in hospitals.

Promoting nutritional health throughout life

Good nutrition in the first few years pays dividends throughout life. This starts with maternal nutrition, because of its importance to the fetus and the evidence that a poor fetal nutritional environment raises the risk of chronic disease in later life (see Chapter 1, pp. 48–50). The failure of pregnant women to obtain a safe and healthy variety of food has long-term social and economic effects. The WHO Regional Office for Europe and UNICEF have developed training materials to help health professionals (46), especially paediatricians, obstetricians and hygienists, to improve the health of women and children through safe food and good nutrition.

Breastfeeding

Exclusive breastfeeding for 6 months is a global health recommendation (26). Many maternity hospitals throughout the European Region have been active in implementing 10 steps to successful breastfeeding, which are the foundation of the baby-friendly hospital initiative, launched worldwide by UNICEF and WHO in 1992. The 10 steps summarize the maternity practices necessary to establish a supportive environment for women wishing to breastfeed and thereby bring about improvements in the incidence and duration of

breastfeeding (http://www.euro.who.int/nutrition/Infant/20020808_1, accessed 9 July 2003):

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within a half-hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food and drink other than breast-milk, unless medically indicated.
7. Practise rooming-in – allow mothers and infants to remain together – 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

The initiative also prohibits the supply of free and low-cost infant formula in hospitals and demands the elimination of advertising and promotional activities for infant formula or feeding by bottle. To become a baby-friendly hospital, every facility that contributes to maternity services and to the care of newborn infants must implement the 10 steps (47).

When a woman is HIV-positive, it is uncertain whether she should breastfeed, as HIV can be transmitted to the child through breast-milk. As a general principle and irrespective of HIV infection rates, breastfeeding should continue to be protected, promoted and supported in all populations. WHO, UNICEF and UNAIDS guidelines for breastfeeding by HIV-positive women (48,49) vary according to local physical and cultural ecology.

When replacement feeding is acceptable, feasible, affordable, sustainable and safe, HIV-infected mothers should avoid all breastfeeding. If the water supply is in general unsafe without additional preparation steps, infant mortality is high and cultural norms foster breastfeeding, however, then exclusive breastfeeding is recommended, and weaning should occur as soon as feasible – taking into account local circumstances, such as the individual woman's situation and the risks of replacement feeding, including infections other than HIV and malnutrition (49).

Strategies to reduce mother-to-child transmission of HIV must be multifactorial. First, reducing the viral load of lactating women is essential to

minimize the excess risk of infection to breastfeeding infants. This may be achieved by making highly active antiretroviral therapy and/or prophylactic antiretroviral regimens available to women (49). In addition, women should be advised to use barrier contraceptives during lactation to prevent further viral infections and consequent enhanced viral loads in breast-milk. Moreover, lactating mothers should be counselled on proper breastfeeding practices to prevent HIV transmission through cracked nipples and mastitis. Further, mothers should restrict the weaning period involving mixed feeding, as this may pose excess risk of HIV transmission (49).

Breastfeeding should be encouraged even where contamination of breast-milk is a concern. Mothers should be reassured that the risk from contamination is very small compared with the overall benefits of breastfeeding.

Introducing semi-solid foods

The age during which complementary foods are introduced is an especially sensitive time in infant development. This transition is associated not only with increasing and changing nutrient requirements but also with the rapid growth, physiological maturation and development of the infant. Poor nutrition and less than optimum feeding practices during this critical period may increase the risk of wasting and stunting and nutritional deficiencies, especially of iron, and may harm health and mental development in the long term. Thus, health ministries should give high priority to the timely introduction of appropriate complementary foods that promote good health and growth among infants and young children.

A WHO publication (47) provides information to help health ministries develop their own national guidelines for feeding infants and young children. It recommends that each country review, update, develop and implement national nutrition and feeding guidelines for infants and young children, using the following recommendations (47):

Health and nutritional status and feeding practices

It is recommended that each country establish nutrition surveillance of infants and young children as an integral part of its health information system.

Breastfeeding practices, feeding patterns and the nutritional status of infants and young children should be monitored regularly to enable problems to be identified and strategies developed to prevent ill health and poor growth.

Recommended nutrient intakes

Each country should use recommended nutrient intakes for infants and young children, based on international scientific evidence, as the foundation of its nutrition and feeding guidelines.

Energy and macronutrients

Provision of adequate dietary energy is vital during the period of rapid growth in infancy and early childhood. Attention must be paid to feeding practices that maximize the intake of energy-dense foods without compromising micronutrient density.

An adequate protein intake with a balanced amino acid pattern is important for the growth and development of the infant and young child. If the child receives a varied diet, however, the quantity and quality of protein are seldom inadequate. Avoiding a high-protein diet is prudent because this can have adverse effects.

During complementary feeding and at least until 2 years of age, a child's diet should not be too low in fat (because this may diminish energy intake) or too high in fat (because this may reduce micronutrient density). A fat intake providing about 30–40% of total energy is thought to be prudent.

Consumption of added sugar should be limited to about 10% of total energy, because a high intake may compromise micronutrient status.

Vitamins

In countries with a high prevalence of childhood infectious disease, determining whether vitamin A deficiency is a public health problem is important.

In countries where rickets is a public health problem, all infants should receive a vitamin D supplement as well as adequate exposure to sunlight.

Minerals other than iron

In countries where iodine deficiency is a public health problem, legislation on universal salt iodization should be adopted and enforced.

Control of iron deficiency

Iron deficiency in infants and young children is widespread and has serious consequences for children's health. ...

When complementary foods are introduced at about 6 months of age, it is important that iron-rich foods such as liver, meat, fish and pulses or iron-fortified complementary foods are included.

The too-early introduction of unmodified cow's milk and milk products is an important nutritional risk factor for the development of iron deficiency anaemia. Unmodified cow's milk should not therefore be introduced as a drink until the age of 9 months and can be increased thereafter gradually.

Because of their inhibitory effect on iron absorption, all types of tea (black, green and herbal) and coffee should be avoided until 24 months of age. After this age, tea should be avoided at mealtimes.

Optimal iron stores at birth are important for preventing iron deficiency among infants and young children. To help ensure good iron stores in her children, the mother should eat an iron-rich diet during pregnancy.

At birth, the umbilical cord should not be clamped and ligated until it stops pulsating.

Breastfeeding and alternatives

All infants should be exclusively breastfed from birth to about 6 months of age.

Breastfeeding should preferably continue beyond the first year of life, and in populations with high rates of infection, continued breastfeeding throughout the second year and longer is likely to benefit the infant.

Each country should support, protect and promote breastfeeding by achieving the four targets outlined in the Innocenti Declaration [on Protection, Promotion and Support of Breastfeeding]: appointment of an appropriate national breastfeeding coordinator; universal practice of the Baby Friendly Hospital Initiative; implementation of the International Code of Marketing of Breast-milk Substitutes and subsequent relevant resolutions of the World Health Assembly; and legislation to protect the breastfeeding rights of working women.

Complementary feeding

Timely introduction of appropriate complementary foods promotes good health, nutritional status and growth among infants and young children during a period of rapid growth and should be a high priority for public health.

Throughout the period of complementary feeding breast-milk should continue to be the main type of milk consumed by the infant.

Complementary foods should be introduced at about 6 months of age. Some infants may need complementary foods earlier, but not before 4 months of age.

Unmodified cow's milk should not be used as a drink before the age of 9 months, but can be used in small quantities in the preparation of complementary foods from 6–9 months of age. From 9–12 months, cow's milk can be gradually introduced into the infant's diet as a drink.

Complementary foods with a low energy density can limit energy intake, and the average energy density should not usually be less than 4.2 kJ(1 kcal)/g. This energy density depends on meal frequency and can be lower if meals are offered often. Low-fat milk should not be given before the age of about 2 years.

Complementary feeding should be a process of introducing foods with an increasing variety of texture, flavour, aroma and appearance while maintaining breastfeeding.

Highly salted foods should not be given during the complementary feeding period nor should salt be added to food during this period.

Caring practices

Policy-makers and health professionals should recognize the need to support caregivers and the fact that caring practices and resources for care are fundamental determinants of good nutrition and feeding and thereby of child health and development.

Growth assessment

Regular monitoring of growth is an important tool for assessing the nutritional status of infants and young children and should be an integral part of the child health care system.

Dental health

It is recommended that the frequent intake of foods high in sugar, sugary drinks, sweets and refined sugar should be limited to improve dental health.

Teeth should be cleaned gently twice a day as soon as they appear.

An optimal fluoride intake should be secured through water fluoridation, fluoride supplements or the use of fluoride toothpaste.

Food safety

Safe food, clean water and good hygiene are essential to prevent diarrhoea and foodborne and waterborne diseases, which are major causes of poor nutrition, stunting and recurrent illness.

Developing good eating habits and preventing childhood obesity

A newborn baby shows innate preferences for sweet tastes and innate dislike for sour or bitter ones (50,51). The classic work of Clara Davis (52,53) showed that children self-selected a healthy diet without being influenced by adults. This points to the possibility that human infants possess a biological control system that enables nutritionally adequate food choice if a variety of wholesome and natural foods is available, but nobody knows whether this still holds when more energy-dense and processed foods become available. From the very beginning, these innate preferences are modified by learning processes, which in turn play a major role in the development of food preferences and food rejection (54,55). Three major processes have been described that modify the child's food acceptance patterns.

- Mere exposure to unknown food – the repeated experience of tasting and eating it – reduces the tendency to reject it. Consequently, children's preference for vegetables, for example, increases with exposure (56).
- Social influences modify food acceptance. Children learn to prefer food eaten by their peers; peer influence may be more influential than parental influence and has been shown to be effective in preschool children (57,58).
- Children learn to associate the physiological consequences of food intake with taste (59,60).

Childhood and adolescence are good times for health promotion interventions based on appropriate knowledge of the personal and environmental determinants of food choice (see Chapter 3, Fig. 3.5, p. 166). Some factors that

can improve the eating behaviour and physical activity levels of adolescents include:

- active participation of adolescents in health promotion, such as learning how to grow, harvest and cook vegetables;
- services for adolescents that ensure confidentiality, such as counselling services;
- appropriate and convenient centres for adolescent health promotion, such as physical activity after school;
- a staged approach to changing behaviour, such as opportunities to experiment with eating fruits and vegetables;
- realistic objectives, such as gradually reducing the intake of sweets, snacks and sugar-containing drinks;
- specific information on the changes advocated and how to achieve them delivered through, for example, interactive internet programmes;
- delivery of the same message from different sources, or restricting conflicting messages (61);
- information that allows reasoned choice, for example, using BMI charts (see pp. 240–241);
- utilization of social and community networks, for example, to create a trend towards healthy eating and increased physical activity;
- the association of desirable behaviour with self-satisfaction and reward, rather than rewarding children with sweets and other unhealthy foods.

The ultimate aim is to strengthen self-efficacy in children and adolescents (for more information, see pp. 239–242 and tables 4.7 and 4.8, pp. 284–287).

Preventing micronutrient deficiency

Micronutrient deficiency is mainly a consequence of poverty and affects a significant proportion of the population even in industrialized countries. Prevention strategies must therefore involve input and resources from a wide range of organizations and sectors, such as agriculture, health, commerce, industry, education and communication (62). They should then work in concert with communities and local nongovernmental organizations (NGOs) to reduce poverty, to improve access to diversified diets, to improve health services and sanitation and to promote better care and feeding practices.

Food-based strategies are the most desirable and sustainable method of preventing micronutrient malnutrition and are designed to increase micronutrient intake through the diet. They can result in multiple nutritional benefits. These, in turn, can achieve short-term impact and long-term sustainability (62). Food-based strategies should work to improve the year-round availability of micronutrient-rich foods, to ensure the access of households, especially

those at risk, to these foods and to change feeding practices with respect to these foods.

Iodine

WHO published a review of iodine deficiency in Europe in 2003 (63). As mentioned, universal salt iodization is the agreed strategy for preventing iodine deficiency disorders (64). It can easily eliminate iodine deficiency globally, but this has not yet been achieved.

The European Region has one of the worst iodization records in the world, possibly because of lack of political will and enforcement of legislation, despite the reported presence of iodine deficiency disorders (see Chapter 1, pp. 40–41). Also, the successful universal salt iodization programmes in some eastern countries in the Region were interrupted and may be difficult to resume (65).

A joint report by WHO, UNICEF and the International Council for Control of Iodine Deficiency Disorders (66) suggested the following action plan to eliminate iodine deficiency disorders in Europe:

- maintaining and even reinforcing advocacy and training on the disorders at the local, national, regional and global levels;
- continuing detailed evaluation and registration of their extent in the Region;
- contributing to implementing universal salt iodization, if not yet achieved, wherever iodine deficiency disorders are documented;
- if necessary, in hard-to-reach areas with severe iodine deficiency and persistent cretinism, administering iodized oil at least to women of childbearing age (67);
- in areas with mild or moderate iodine deficiency, iodine supplementation for infants, children and women of childbearing age by tablets of potassium iodide at physiological levels during gestation (68), lactation, infancy and early childhood;
- organizing quality control and monitoring the programmes of iodine supplementation from the producer to the consumer, including ensuring that the food industry continuously checks the level of fortificants added to food under the supervision of the health ministry and that the health ministry monitors the iodine status of the population (69);
- evaluating the side effects of iodine: essentially the occurrence of iodine-induced hyperthyroidism; and
- monitoring salt intake.

In addition, a communication strategy should accompany iodization programmes and simultaneously promote a healthy diet.

Iron

Efforts to eliminate iron deficiency should first be directed towards promoting breastfeeding and the use of iron-rich complementary foods; then the availability of and access to iron-rich foods should be ensured. Complementary foods include meat and organs from cattle, fowl, fish and poultry and non-animal foods such as legumes and green leafy vegetables. The focus should also be on foods that enhance the absorption or utilization of iron, such as both animal and non-animal foods that are rich in vitamins A and C and folic acid (62) (Table 4.5).

Table 4.5. Enhancers and inhibitors of iron absorption

Enhancers	Inhibitors
Haem iron, present in meat, poultry, fish and seafood	Phytates, present in cereal bran, cereal grains, high-extraction flour, legumes, nuts and seeds
Ascorbic acid or vitamin C, present in fruits, juices, potatoes and some other tubers, and other vegetables such as green leaves, cauliflower and cabbage	Food with high inositol content
Some fermented or germinated food and condiments, such as sauerkraut and soy sauce ^a	Iron-binding phenolic compounds (tannins), foods containing the most potent inhibitors resistant to the influence of enhancers (including tea, coffee, cocoa, herbal infusions, certain spices, such as oregano, and some vegetables)
	Calcium, especially from milk and milk products

^a Cooking, fermentation or germination of food reduces the amount of phytates.
Source: Michaelsen et al. (47).

As noted in Chapter 1 (see Fig. 1.24, p. 52), unfortunately tea is often introduced as early as 2 weeks in most central Asian republics and other countries (46). Exclusive breastfeeding should therefore be strongly promoted throughout the Region to reduce the risk of anaemia in both infants and young children.

General food fortification uses the existing food production and distribution system. Adding iron to foods does not necessarily mean that it will be absorbed or will help to prevent deficiency. Much iron added to cereal food today, especially reduced elemental iron, is poorly absorbed. For example, soluble iron fortificants such as ferrous sulphate are absorbed to the same degree as the intrinsic non-haem iron in the diet. Iron fortificants are therefore poorly absorbed when added to cereal-based diets. Fortifying basic foods such as wheat flour provides extra iron for adult men and post-menopausal women who often have no deficiency; this could lead to an increased risk of atherosclerosis and cancer because of increased oxidative stress from the pro-oxidant properties of iron (70).

The causes of iron deficiency in the target population must be established before fortification programmes are introduced. Fortifying a foodstuff is

appropriate only if iron deficiency is related to low intake, low bioavailability or both, and not to the presence of gut parasites (71). Although flour is a suitable vehicle for iron fortification in programmes aimed at older children and adults, it is not suitable for infants and young children because they cannot eat enough.

Iron-only interventions cannot solve the problem of anaemia, as all anaemia is not related to iron deficiency (72).

Promoting healthy ageing

Healthy ageing is a major concern in the European Region (see Chapter 1, pp. 58–59). Decreasing levels of physical activity reduce energy needs, so older people should eat foods rich in micronutrients to compensate for the reduction in intake. Again, WHO recommends a daily intake of at least 400 g of fruits and vegetables for older people (10). Degeneration of eyesight, lower resistance to infection and other micronutrient-related deficiencies can coexist with obesity, making managing the health of older people difficult.

Although genetic and hormonal factors have a role in determining bone mass, environmental factors can also contribute. Nutrition and physical activity contribute both to attaining optimal peak bone mass in young adulthood and to the rate at which it is lost afterwards. People who experience bone loss may benefit from a programme of weight-bearing and endurance exercises. These include walking, climbing stairs, swimming and dancing. The principal benefit from an exercise programme, increasing muscle strength and endurance, should help prevent falls (73).

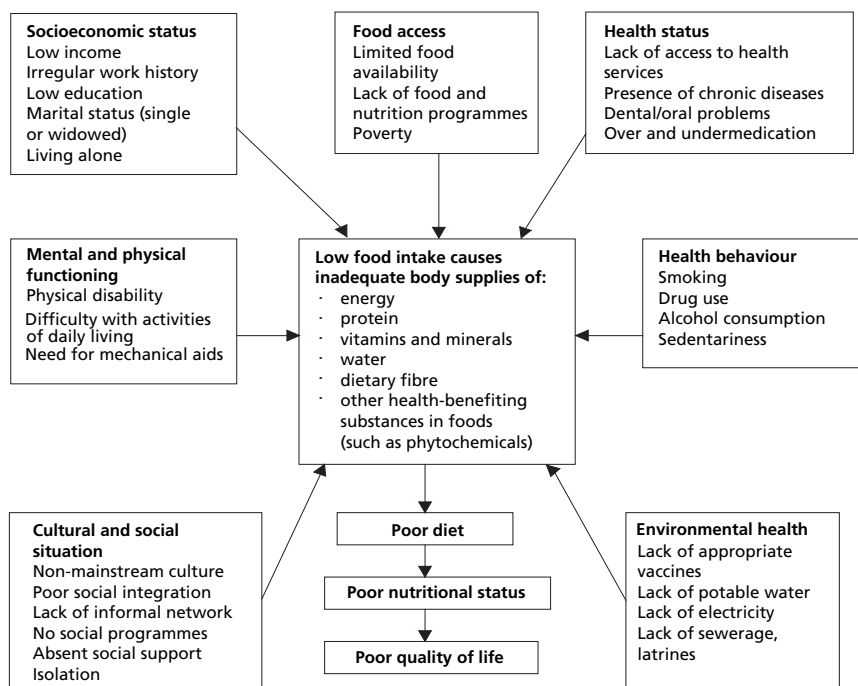
Fig. 4.3 (resembling Fig. 3.5) summarizes the risk factors for poor nutritional status among older people. Risk factors for malnutrition – including socioeconomic status, health, lifestyle, environment, mental and physical functioning and cultural and social situation – are the underlying reasons why people eat less or poorly. People with one or more risk factors are more likely to become malnourished. Various risk factors are often linked and may be more or less common in certain situations.

Marketing food

Advertising is one of the most powerful tools shaping food preferences (75). Experiments have shown that exposing children aged 2–6 years to 20-second commercials significantly influences their food preferences (76). “Exploiting kids, corrupting schools” (77) describes the creativity of marketing by the food industry, which extends beyond television, magazines, billboards, store displays and the Internet to schools.

In 1996, Consumers International found that candy, sweetened breakfast cereals and fast-food restaurants accounted for over half of all food advertisements in Australia, Austria, Belgium, Denmark, Finland, France, Germany,

Fig. 4.3. Risk factors for poor nutritional status in older people



Source: adapted from Bermudez & Dwyer (74).

Greece, the Netherlands, Norway, Sweden, the United Kingdom and the United States (75). The study found that food advertising comprises the largest category of products advertised to children and adolescents in virtually all countries. Among the European countries, Sweden and Norway had the least advertising per hour and the United Kingdom the most.

Unfortunately, the most heavily advertised foods tended to be those high in fat and energy and low on micronutrients. A nutritional analysis of the advertised products found that 62% of advertisements were for products high in fat (> 30% energy), 50% for products high in sugar (> 20% energy) and 61% for products high in sodium. Most consumers probably do not know that salt and sugar are the ingredients most widely added to food, followed by fat and oil. The sugar and salt added during food processing, hidden from the consumer, account for three quarters of the total consumed (75). In the United Kingdom (78) and France (79), most advertisements are for food products, and the vast majority of these are for foods high in sugar and/or fat.

Whatever the marketing strategy, food advertising dwarfs efforts for health education in most countries. This imbalance in information and power

between industry, consumers and government results in the unprecedented promotion of energy-dense food.

Health authorities should encourage companies' promotional messages to be consistent with national dietary guidelines. They may also develop partnerships to promote nutrient-dense foods such as fruits and vegetables. The aims of marketing strategies could also include stimulating or rebuilding local markets for regional food, especially by incorporating aspects of fair trade, environmental protection, traceability and safe food production.

Labelling and health claims

Food labelling is important for informing the consumer of the nature of processed food and forms an important part of food legislation (80). A food label must by law inform the consumer about the product's weight, production and/or expiration date, ingredients, manufacturer's name and address, place of origin and nutrition information. Other details are optional. Nutritional labelling focuses on energy, protein, fat and carbohydrate and, increasingly, fat composition, dietary fibre, salt and sugar. Information on minerals and vitamins is required when nutritional claims are made (81).

Claims

Claims – the producer's description of product characteristics – often receive a lot of label space (82). These may be:

- nutrition and health claims, although whether health claims should be permitted is heavily discussed globally;
- environmental labels, which may result in the consumer being more concerned with the environmental friendliness of the food than the nutritional aspects;
- quality labelling schemes, although the meaning of quality varies considerably between producers; and
- negative declarations, stating ingredients the product does not contain or treatments to which it has not been subjected.

Many members of the Codex Committee on Food Labelling have expressed concern about health claims, as they would be misleading and confusing, especially if provided without appropriate consumer education programmes (83).

Each country in the EU currently has its own regulations (82). An overall labelling policy for the Region is needed based on factual knowledge, evaluation of all labelling elements and fundamental goals and objectives (84). Consumer representatives should be closely involved in developing such a policy and the strategies and measures introduced for implementing it.

A survey by the British Heart Foundation Health Promotion Research Group in 1997 (85) found that consumers use the nutrition information panel on food packets in less than 1% of purchases and use nutrition claims such as “low fat” and “high fibre” for about 5%. If specifically shopping for a healthier diet, consumers were found to be nearly twice as likely to use the nutrition claims than the nutrition information table. Moreover, at least 40% of decisions involving the nutrition information table were incorrect.

In some countries symbols are used as an overall sign of low fat, low salt and sugar, such as “S” in Denmark and keyholes in Sweden (86).

Food control policy

Existing food control policies

Agencies for food safety control

The 1999 WHO survey (24) reports food safety information for individual countries. A major component of an effective food safety strategy is the coordination and harmonization of national and international food safety control services. A WHO meeting in 2001 (87) aimed: to evaluate the advantages and disadvantages of using independent, scientific consumer protection agencies to coordinate food safety control at the national level; and to compare existing alternatives. Part of WHO’s mission is to ensure that decisions on risk management consider consumer health first and foremost and to inform WHO Member States about developments in other countries and parts of the European Region (<http://www.euro.who.int/foodsafety>, accessed 3 September 2003).

In countries, several agencies and/or ministries have different roles and responsibilities in policy on and monitoring and control of food safety. Communication between and within them is therefore essential for effective coordination. A food agency should establish networks of experts and organizations within the country and internationally (88).

A food authority needs a variety of resources to succeed. These include access to high-quality information, experts performing research, high-quality technical support to ensure that laboratory tests are correctly made and interpreted, and the transmission of information, including the results of surveillance (88). In addition, an agency should have procedures for rapid response to emergencies (88).

Example: the French Food Safety Agency

The French Food Safety Agency was established in 1999 under the triple supervision of the ministries of health, agriculture and consumer affairs, and against a background of growing consumer concern about HIV transmission through blood and a variety of other issues, including the BSE crisis and the heterogeneity of the scientific committees (88).

The Agency's structure, objectives and responsibilities are more comprehensive than those of some other national food agencies. Its wide evaluation responsibilities cover the entire food chain, including food for human and animal consumption, animal welfare, water and genetically modified organisms (GMOs). Unlike agencies in some other countries, however, it has no authority to enforce the law, and is accountable to three ministries.

The Agency is a government institution, led by a board of directors with a president and 24 members, including representatives of the Government, of consumer associations and professional organizations, and Agency staff and scientists. The Agency draws on the knowledge of experts who are members of its steering committee, specialized committees and different working groups on specific issues.

It has a Science Council whose purpose is to "watch over the consistency of scientific policy". The Agency's laboratories carry out scientific research and provide knowledge and scientific and technical support.

The internal organization of the Agency comprises a General Management Division, headed by the Managing Director; the Secretary's Office; and four departments responsible for the scientific activities of the Agency: evaluation of nutrition and health risks, veterinary medicine, animal health and well-being, and food safety.

The Agency's role is to issue opinions, draw up recommendations, carry out research, provide technical and scientific expertise and carry out education and information activities. It monitors and evaluates risks within the framework of food safety in the country, but has no direct monitoring or enforcement powers. These are the responsibility of the ministries concerned.

In relation to food safety, the Agency is systematically consulted on all projects concerning the drafting of regulations or legislation or the authorization of a new product or process within its field of competence. In particular, it is responsible for:

- the nutritional and functional properties of food or dietary products, with the exception of medicines for human use; and
- health risks related to the consumption of food products composed of or resulting from GMOs.

The Agency's evaluation activities cover:

- the entire food chain (including drinking-water), from the production of raw materials to distribution to the final consumer;
- each of the stages of this chain as specified by law: production, transformation, preservation, transport, storage and distribution; and
- food products for both human and animal consumption.

The Agency supervises the National Agency for Veterinary Medicinal Products. Its independence is guaranteed by the appointment of experts solely on academic criteria, procedures to avoid conflicts of interest, autonomy to determine areas of work and the publication of all its opinions.

Food control systems

Growing concerns about food safety have led many countries to review the effectiveness of their food control systems. Throughout the European Region, countries show marked differences in approach, including the division of responsibilities for risk assessment, management and communication. They also differ on the question of whether local or central authorities or a mixture of the two should be responsible for enforcing food law. Food control systems are most effective when based on the best available scientific advice from all sectors concerned and using a transparent and open approach to decision-making. A food control agency must fit the cultural, economic and political needs and conditions of the country: there is no single model (88).

Chapter 2 discussed the proportion of foodborne disease that relates to each part of the food chain. Most problems come from the farming sector as a primary source of pathogens; slaughterhouses; and food handling and catering.

Each sector needs separate measures, and several reports have outlined these needs. Not only is an appropriate surveillance system needed for assessing the dominant organisms involved, the regional distribution of problems and their potential sources, but, more important, all countries should consider instituting the HACCP (hazard analysis and critical control point) approach to controlling hazards (89).

Countries often take different approaches to dealing with the same pathogen, and each needs to consider the best strategy. For example, Sweden has worked for many years to ensure that its poultry flocks are *Salmonella*-free without the routine use of antibiotics (see Chapter 2). The EU has established a wide range of regulations relating to the proper conduct of slaughterhouses, and criteria for limiting the risk of contamination of carcasses by *E. coli*, by such means as insisting that the animals entering the slaughterhouse be clean. The BSE regulations also demand very specific measures. Further, many countries require that transport systems comply with temperature regulations, and storage systems need to be developed to limit cross-contamination.

Given the complexity of these issues, it is necessary to assess the most hazardous part of the operation and to seek to reduce progressively the entry of pathogens into the food supply. Catering and other retail establishments demand a further range of regulations and, in many countries, specific groups, often attached to or part of local authorities, are responsible for registering and authorizing food outlets, with strict rules for compliance, food sourcing

and food hygiene. The CCEE have a strong tradition for maintaining a public hygiene service, while in western Europe responsibility has shifted from the local authority and public health officers to supermarket chains and food manufacturers. Each country needs to ensure that a proper system is in place both to assess hazards and to handle them effectively, recognizing that the EU has explicit regulations and that countries seeking to export to the EU will have to comply with them.

The food control infrastructure in each country in the European Region is the result of development over more than a century and has been influenced by the need to cope with the various problems encountered during this period. In Scandinavian countries, for instance, food control systems have traditionally focused on animal foods and microbiology, and veterinarians have played a key role. The Netherlands and the United Kingdom have traditionally emphasized food contamination and composition, and chemists have had central positions. In the NIS, food control grew out of the medical profession and has been closely linked to epidemiology, medical investigation and a public hygiene service.

In most countries, several ministries, departments and branches have shared the responsibility for food control. Health, agriculture, environment, trade and industry ministries are normally involved. The responsibility may also be divided between national, regional and local governments.

Considerations for the future

Every country has its own food control infrastructure and social, economic and political environments. National food control strategies are therefore normally country specific. To modernize the food control infrastructure, government agencies may choose to seek assistance in the various guidelines given by international organizations. The WHO *Guidelines for strengthening a national food safety programme (90)*, gives guidance for strengthening food safety programmes. It recommends that the process start with the preparation of a country profile that assesses the problems and the food control infrastructure at the national level. It advises on preparing and implementing a national food safety programme and formulating food law and regulations, and gives recommendations on control activities, such as food inspection and risk analysis.

Risk analysis

The concept of risk has become central to the regulation of food safety. An objective basis is required for regulating food safety and for solving conflicts in food trade. Legislation traditionally protected national food production against competition from imports. Self-sufficiency in food and food security were important and legitimate objectives for most countries following food

shortages caused by international conflicts, particularly following the Second World War. Protective barriers against imported food were crucial for the survival of certain food industries and are therefore often associated with commercial interests, although they may claim to be based on scientific evidence.

To address some of these problems – as well as to protect the consumer – the FAO/WHO Codex Alimentarius Commission was set up in 1962. Since then it has worked to develop international food standards, guidelines and recommendations to facilitate the free flow of food across borders.

During the negotiations on liberalization of the world trade in food in the General Agreement on Trade and Tariffs (GATT) in the early 1990s, the participating countries agreed to remove the technical barriers to trade. At the same time, they selected scientific risk assessment as the best tool to help harmonize food legislation. A country could only hinder or prohibit imports of certain foods if scientific analysis demonstrated that they presented risks to the population or the environment. The aim is to use risk assessment as an objective and universally accepted basis for food regulations and a tool to resolve trade disputes. These efforts have largely succeeded.

Nevertheless, the scientific concept of risk differs greatly from consumers' perceptions. The scientific evaluation of risk is typically expressed in terms of the numbers of expected additional cases from a well defined cause over a specified time period. In the mind of the individual consumer, however, other aspects of risk are equally important. Whether consumers run a risk voluntarily (such as smoking) or involuntarily (such as the risk of BSE) makes a large difference in individual reactions (92,92). They may also consider factors other than personal risk – such as the risk of damage to the natural environment. As a result, consumers may be unwilling to accept food regulations that conflict with their perception of risk or harm – as shown, for example, by reactions against GMOs in the Region. The risk may be small, but consumers perceive it as beyond their personal control and as bringing potential harm with no obvious benefit.

The internationally accepted concept of risk is technically and economically oriented and based on principles formulated by a FAO/WHO expert group in 1998 (93). The main conceptual tool is risk analysis, which consists of three elements: risk assessment (scientific advice and information analysis), risk management (regulation and control) and risk communication (see Fig. 4.4). Risk assessment is considered a scientific discipline in which researchers assess the nature of the hazard, the exposure of the population and the likely incidence of illness as a result.

There is great debate about how to ensure that the distinct needs of each of the three components of risk analysis are dealt with properly. In countries such as the United Kingdom, a quasi-independent national body undertakes all three, with an agreed limited remit in management and the need to report

to Parliament and making the health minister ultimately responsible for management decisions. Other agencies, such as the new European Food Safety Authority, consider that risk assessment must be conducted independently and the analysis made public. Risk management is then a different responsibility because, although health may be seen to be paramount, other economic, political and societal issues may need to be taken into account in practice. Thus, the EC, with the Council of Ministers and the European Parliament, has the formal responsibility for deciding how to manage environmental, food safety and public health issues, and a scientific group is responsible for providing the best possible scientific assessment of the issues to be addressed and the attendant uncertainties.

Separating risk assessment from risk management and risk communication is theoretically sound because assessment initially needs to be made without concern for the political, social and financial issues related to management decisions. It must interact with the two other segments of risk analysis, however, and having an evaluation that simply assumes that all implementation and management issues have been handled perfectly is not appropriate. In practice, implementation has repeatedly been shown to be imperfect. True risk assessment requires a transparent audit of the implementation process.

In addition, risk assessment rapidly becomes involved in the problem of risk communication because many of the issues are of intense public concern. Many European governments used to provide simple, understandable messages for consumers, with scientific panels providing a summary of their internal debates. Now, however, civil society not only must be represented in developing the remits and agendas of scientific committees but also should be actively involved before the final opinion is formed. The assessment must be as rigorous and detailed as possible, to reassure the public that the issues have been properly handled. How to express and communicate the degree of complexity of the analysis is a challenge that requires additional expertise to that traditionally involved in risk assessment.

Many of the problems surrounding BSE, for example, arose because management issues and other interests appeared either to modify or to limit the appropriate scientific scrutiny of risk. This is why the need for transparency in independent scientific analysis is now greatly emphasized. Some agencies reinforce this by ensuring that representatives of civil society and other stakeholders formally take part in the assessment process, which had been seen as the domain of scientists alone. It is now recognized that scientists often failed to take account of the public's concerns and may not have addressed the issues in a way that could deal directly with these concerns. The Management Board of the European Food Safety Authority is recognized to require members of civil society, including industrial and other representatives.

The conventional approach to risk analysis specifies a purely scientific basis for assessment. Most pressing food safety problems, however, are characterized by the absence of a complete scientific basis and by the presence of parties with a variety of interests and concerns: commercial, political, economic, legal and religious. This can be seen in the debate over GMOs, in which the EU group contributing to the EU–US Biotechnology Consultative Forum included senior political and consumer interests in addition to the usual range of scientific disciplines. The broader dimensions also need to be included in the debate on many other food safety issues, from the use of hormone growth promoters, pesticides and food irradiation to food additives, labelling and health claims. Scientific knowledge about the hazards and their risks – including their magnitude, extent and rate of change – may be incomplete, and this may reflect earlier priorities in allocating funds to research.

Further, even when the scientific knowledge base appears adequate, the recommendations that emerge from a scientific assessment may be of limited value. The terms of reference for the assessment may be inappropriate or the assessors may be affected by interests such as competition for resources, commercial dependence, theoretical allegiances, personality conflicts or strongly held personal beliefs.

Developing a broader approach to risk analysis

Some types of risk assessment can become very complex when large scientific unknowns and substantial economic interests are involved and major societal issues need to be considered: for example, when assessing the impact of global change. In food safety, this approach has been discussed in documentation submitted to the European Parliament (94). Non-scientific factors should be seen as framing the scientific debate, both before and during risk assessment (Fig. 4.4).

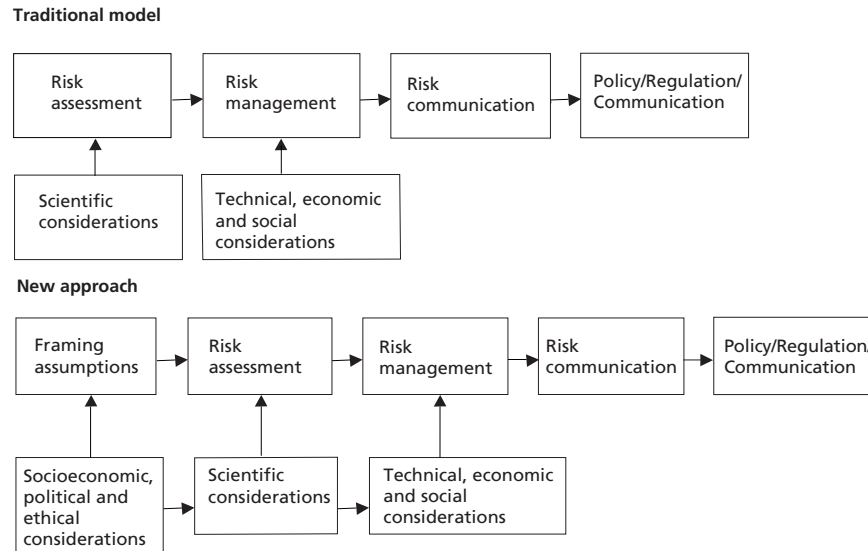
Allowing non-scientific factors to enter the assessment process could do much to ameliorate the concern that present processes neglect consumers' interests. The institutional structures capable of handling this form of risk assessment have yet to be built, but they may prove to be a politically expedient means of encouraging consumer to accept risk assessment techniques.

In the meantime, because of the overwhelming economic importance of having a universally agreed principle on which to base international food regulation, several attempts have been made to improve consumers' acceptance of risk analysis. These include using the precautionary principle and recognizing factors other than science in setting standards for international trade.

The precautionary principle

In both EU and global food policy, the precautionary principle has been introduced or at least affirmed as a guiding principle to be applied when a

Fig. 4.4. Two approaches to risk analysis



Source: adapted from Millstone (95).

scientific analysis is incomplete. The idea is to let scientific doubt benefit the consumer. A precondition for applying the principle is clear recognition that the science is incomplete, that safety cannot be assured and that precautions should therefore be applied.

From one viewpoint, most food safety policies are precautionary in that risks are assessed in an anticipatory rather than a reactive way. For example, there are positive rather than negative lists for pesticides, veterinary medicines and food additives, and standards are or may be set before overt harm occurs. Thus, having a legislative framework, making routine pre-marketing reviews of new products and processes and operating a regulatory regime amount to the exercise of precaution.

From a second viewpoint, which corresponds to the traditional model shown in Fig. 4.4, precaution is seen as a non-scientific consideration that may be invoked only if there is some clear evidence of a particular risk, a scientific risk assessment has first been conducted and some residual uncertainty is identified. Risk managers (as distinct from risk assessors) may then make judgements on the steps that might be taken to avoid or diminish the risks about that remain uncertain and imprecise. In this model, precautionary judgement is distinct from the risk assessment or scientific studies.

A more valuable but complex approach employs the precautionary principle before, during and after the risk assessment; it is increasingly being adopted. A relatively precautionary risk assessment does not interpret or represent the absence of evidence of risk as if it were evidence of the absence of risk. Precaution, in this model, is also a consideration for risk managers who must make explicit judgements about the extent to which uncertainties may or may not be acceptable and how they may take steps to reduce these uncertainties.

Consumer organizations have emphasized the importance of the precautionary principle when such issues as substantial equivalence arise. The concept of substantial equivalence was seen as a means for justifying little scrutiny of new products or processes if they seemed to be very similar, often as assessed by relatively crude techniques, to a previous product or process. In practice, the assessment of substantial equivalence should be just a preliminary step to framing the analyses that should then be conducted.

Other legitimate factors

Non-scientific factors clearly have a legitimate role in the framing of risk assessment in European risk analysis. For example, in the evaluation of GMOs or pesticides, risk assessment should address not only to the direct effects on human health but also the indirect and secondary effects, such as the risk to animal health and environmental integrity. The EC has accepted that the second approach should prevail: a 2002 regulation on food law (96) stated that "... scientific risk assessment alone cannot, in some cases, provide all the information on which a risk management decision should be based, and ... other factors relevant to the matter under consideration should legitimately be taken into account including societal, economic, traditional, ethical and environmental factors ...".

Non-scientific issues can frame the scientific risk assessment by determining how far the assessment should extend. Should an assessment be confined to the direct effects on human health or include the effects on the non-human participants in food production and on the surrounding ecological systems? For example, the risk assessment of the yield-enhancing hormone bovine somatotrophin for milk production might be limited to the effects of residues in milk and milk products on human health or might be extended to include the effects on the health and welfare of the animals receiving the treatment. Similarly, the risk assessment of a pesticide may be limited to its health effects as a residue in food ingredients or can be extended to include its effect on ecosystems and farmworkers' health. The same questions can be applied to GMOs; should they be assessed for their environmental impact and their potential impact on neighbouring farms? In

Austria, stringent criteria must be satisfied, showing that the use of a proposed GMO will be at least as benign as organic farming and will provide positive environmental benefits compared with currently available alternatives (97).

In all these cases, the risks can be scientifically assessed, but the choice of the scope of the risk assessment may not be a purely scientific judgement. A mechanism for setting the scope of risk assessment needs to be established, and consumer participation in this mechanism should be encouraged (97).

Definition of the scope of such legitimate factors is being studied at the international level, especially in the Codex Alimentarius Commission. In addition to the environmental impact of production methods and animal welfare, examples of such factors include fair trade, consumers' expectations for product quality, appropriate labelling information and claims, and the definition of the essential characteristics of products (98).

This may be the first step in institutionalizing the framing assumptions shown in Fig. 4.4, but a coherent structure and process are lacking. The debate about risk often takes place in the mass media, where risks are made more readily visible and their political consequences are shaped. The mass media may tend to dramatize and oversimplify complex issues. In such a context, risk assessment tends to become intimately linked with risk communication. The mass media also spotlight the role of risk managers, challenging the authorities and their spokespeople to perform roles for which they may not be well prepared.

The risk communication process reinforces the need to consider other legitimate factors at an early stage in setting food safety requirements. Providing correct, relevant and meaningful information about risks to consumers in clear and understandable language is no longer sufficient. The EC noted (99): "Risk communication should not be a passive transmission of information, but should be interactive, involving a dialogue with and feed-back from all stakeholders". Probably very few national food safety authorities in the Region are involved in such interaction.

A continuing problem is that stakeholder groups – including consumers, food workers and local food authorities – may need to develop their skills to ensure they can make constructive and participatory responses to risk communication processes. If stakeholders are to participate constructively, all stages in risk analysis need to accommodate interactions with these groups. Steps are being taken to formalize these relationships in the United States, where a report (100) introduced a new approach to risk management that combines scientific analysis with continuing deliberations with affected parties, such as individuals and interest groups including NGOs.

In the United Kingdom, citizens' juries and other mechanisms have been used to gain insight into consumers' perception of risk and other factors they

believe to be legitimate in assessing risk and ensuring food safety and environmental protection (101).

Changes in the responsibility of official food control systems: the use of HACCP

Previously, an official food control system was seen as carrying the major responsibility for securing a supply of safe food for consumers. It relied heavily on certification, testing end products and comparing the results with official standards. This is still the case in many countries, especially the NIS (24).

In contrast, the current trend in international food legislation is to require producers – feed manufacturers, farmers and food operators – to take primary responsibility for food safety. Food control authorities monitor and enforce this responsibility by operating national surveillance and control systems covering the food chain. Further, the focus has shifted from testing end products to risk assessment and food companies' implementation of food safety assurance systems based on HACCP principles.

According to a 1993 directive (102), EU countries should ensure that all food businesses implement their own quality control systems based on HACCP principles. This applies to both small enterprises and large food manufacturers, although it excludes primary producers. In general, large enterprises have established quality control systems and operate them successfully. Large companies have access to highly trained technicians who understand HACCP principles and the language in which regulations are written. This is not the case for many small and medium-sized businesses, and they can have difficulty in fully implementing such quality control systems.

Small and medium-sized businesses are most numerous at both ends of the food chain: farmers and small retail shops and restaurants. Unfortunately, these are where the most serious safety problems in the food chain exist. For instance, foodborne problems with *Salmonella* and *Campylobacter* spp., pesticide residues, dioxin contamination and BSE arise from farming practices. Similarly, hygiene problems are greatest in small retail outlets, restaurants and private homes. It is a problem that the EC's major strategy, HACCP, is not very effective here, where the need for food safety measures is greatest.

In addition, although HACCP deals adequately with well recognized problems in a routine food production process, it deals less well with emerging problems and poorly identified critical control points. BSE is a case in point: there was considerable uncertainty about the nature of the disease, its possible source in the rendering process, its possible presence in sheep populations, the potential contamination of pastureland, the export of meat and bone meal or the infectivity of bovine blood (used for calf feed throughout the 1980s and 1990s). HACCP procedures were not sufficient with this emerging disease;

neither do they prevent the transfer of material from GMOs in experimental crops into the food supply (for example, into honey).

Modernizing food control

Because food control infrastructures in all European countries have developed over decades in response to changing economic and social conditions, experience shows that changing them is difficult. Such systems tend to be large and bureaucratic and have staff accustomed to doing their work in well established routines. One way to start the process of change is to reach agreement on a number of basic principles for strengthening and developing the food control infrastructure, such as the following.

- Food producers and food handlers have the key responsibility for ensuring food safety by establishing effective quality control systems.
- The primary role of public food safety authorities is to ensure compliance with food regulations, which may best be achieved by auditing food handlers' quality control systems.
- The food safety system aims at prevention rather than cure.
- Inspections should be carried out according to need.
- Analytical control functions primarily as a support to food inspections.
- Control activities should attend to both the immediate cause and the original source of a problem.
- The means of enforcement must be necessary, sufficient and proportionate to the risks involved.

The principles must reflect the situation in which the food control infrastructure will have to operate. This means taking account of the important changes in recent decades in consumers' attitudes towards risk and food safety.

Several elements require consideration before a food control infrastructure can be strengthened, including consumer-centred activity, new approaches to enforcement and comprehensive coverage of the food chain.

Consumer-centred activity and the allocation of responsibilities

Food safety measures must not only ensure safe food but also be seen to do so. Consumers need to be assured that controls are in place and are fully and properly implemented.

One move to establish consumer confidence has been removing food safety responsibilities from departments responsible for the trade interests of the food industry and agriculture and giving them to a new independent agency (87,88). Whether independent agencies can really improve food safety remains to be seen.

An alternative approach has been tried in Denmark, where formerly separate departments were combined. In 1997, responsibility for the food control infrastructure was vested in the new Ministry of Food, Agriculture and Fisheries. The old Ministry of Agriculture and Fisheries merged with the National Food Agency, which had previously been within the Ministry of Health, to create a ministry with a clear consumer profile, without losing connections with producers, traders and manufacturers.

This approach does not separate the inherently conflicting interests of consumers and producers, but locates them within one ministry and gives one minister the responsibility for resolving conflicts. In addition, Denmark's Ministry of Food, Agriculture and Fisheries can implement regulations throughout the whole food chain, from farm to fork. The crucial test of this way of organizing the food control system is its ability to maintain the confidence of consumers. This depends on the Ministry's ability to keep the decision-making process open, transparent and honest and to ensure adequate consumer participation.

Some other countries divide food control responsibilities between different ministries or government departments, such as health, agriculture, environment, industry or trade and tourism. Dialogue between these departments may be limited, and activities may easily and unintentionally overlap or be duplicated or omitted. This fragmentation may also lead to confusion over jurisdiction between agencies and their inspectors. As a result, some sectors of the food chain may receive intense scrutiny and others, little or no regulatory supervision or inspection. Both consumers and industry find these arrangements confusing and frustrating, and they do little to improve consumer confidence in the integrity of the food supply.

New, market-oriented means of enforcement

In practice, making food producers and handlers comply with regulations is often difficult for food control authorities. The traditionally available means of enforcement are not particularly strong. Food establishments can typically be ordered to correct things that are not in accordance with regulations. More serious cases may involve the police and courts, but fines and other penalties are usually modest. Food control authorities usually employ more dramatic means only when public health is endangered.

As a consequence, food establishments may be tempted to cut their standards: for example, to reduce cleaning costs and pay the fines for poor hygiene. The food control system may lack means of enforcement that are strong enough to convince food producers and handlers to improve their practices, and enforcement drains the resources of national food inspection services. These are good reasons to seek innovative, appropriate and more effective means of enforcement.

The classic regulatory approach requires that the regulated activity be reasonably stable; areas undergoing rapid development are not well suited to regulation by rigid rules. Indeed, rules always lag behind problems, and the need for continuously adjusting rules demands many resources. In addition, those who are supposed to follow the rules should know them and perceive them as sensible and relevant. Rules that are not considered relevant will not be carefully followed.

In other sectors of modern society, the use of detailed rules and regulations is in general diminishing and the use of more flexible and less precise framework laws is increasing. The following examples show how food regulations can be adapted to deal with the more flexible activities in modern market economies.

Naming and shaming: publishing inspection results

Food authorities in several countries are already using market forces as a tool by informing consumers of the results of inspection in individual food establishments. Several states in the United States require that restaurants display their latest inspection reports in the customer areas. In certain states the restaurants are classified into categories, such as A–E, according to hygienic performance. The inspection results for all 10 000 restaurants in New York City are published on the Internet (<http://www.nyclink.org/html/doh/html/rii/index.html>, accessed 10 November 2002). In the United Kingdom, the inspection results from all slaughterhouses and meat processors are published according to a special classification system (the Hygiene Assessment Scheme).

In 2001, Denmark's Parliament (*Folketing*) passed an amendment to the food law requiring the Danish Veterinary and Food Administration to publish the results of food inspections. The inspection results include a classification of food establishments into four categories according to performance. An establishment must exhibit the inspection report in the customer area, and all results are published on the Internet. The primary purpose is to enable consumers to select food shops and restaurants according to their hygiene status, to reduce the risk of food poisoning. Compliance with other legislation is also recorded. It is hoped that the practice will influence food establishments to practise good hygiene.

Sticks and carrots: linking costs to behaviour

The idea is to reward the food enterprises that follow the law by giving them a competitive advantage. For example, award schemes, giving accolades for good practice, can be used so that the recipient of an award has a marketing advantage.

Food companies that break the regulations should receive sanctions that can reduce their competitiveness. Fines might be higher and could be more

immediately applied, as with road traffic offences. When necessary, business could be suspended with minimal delay.

More proactively, a polluter-pays system may be developed in which food establishments that do not comply with the regulations must pay the cost of the food control system, including their own inspection. For example, they could be charged for inspections, and the cost and frequency of reinspection would be based on the previous inspection results.

Creating a culture of good practice

Norms and knowledge are soft tools that food control authorities can use to enforce national regulations. They require standards for good practice to be set and disseminated to all food establishments. One method may be to give awards to the establishments in a locality with the best practices and to use these to encourage others in the area.

Educating staff is vital to ensure full-hearted compliance. Food establishments should recognize the need to train food handlers, and training should be made available to all employees to ensure a food hygiene culture based on consistent and well understood principles.

Food control authorities need to become centres of knowledge, using norms and knowledge as tools. They should continually gather and disseminate new information. After appropriate interpretation of the information, the authorities could form new norms in dialogue with both consumers and the relevant food industry.

If necessary, a system of licensing might be appropriate, although the numbers of small businesses involved, and their short lifespan, may militate against licensing. Even with a licensing system, surveillance and inspection needs to enforce regulatory compliance.

Product liability

Besides regulation and criminal prosecution, food establishments may be subject to private civil prosecution for damages caused by the products they sell. The EU has introduced generalized product liability to primary producers, including farmers (103).

The opportunities for private prosecution are limited if food is untraceable. This problem is not insurmountable, and improvements in traceability schemes are already being implemented.

Proving liability is difficult if the harmful effects of food occur long after a person was in contact with it. The problems of delayed harm can be dealt with by using insurance schemes that require no-fault compensation.

Insurance schemes that cover food establishments for product liability are available, although ensuring that they cover the use of new technology, such as genetically modified foods, may be difficult.

Food security and sustainable development policy

Existing promotion measures

The latest WHO analysis of policies and practices in nutrition, food safety and food security in 1998–1999 (24) indicates that food insecurity is widespread in many countries of the European Region (Table 4.6).

The socioeconomic transition undergone by many eastern countries in the Region has reduced food security. For example, the Baltic countries and other NIS reported that many low-income people depend substantially on subsistence farming and home-grown produce. Declining agricultural production was reported to result from a lack of financial support, expertise and improved agricultural methods. In addition, collaboration between the different sectors involved in producing and distributing food was reported as very poor.

In contrast, western European countries reported abundant food supplies, but several acknowledged the need to reduce farm inputs (fuel, pesticides and antibiotics) and to encourage greater sustainability. There is some evidence that economic concerns may be taking priority over health. For example, Iceland reported the taxation of imported fruits and vegetables to protect local producers, probably resulting in lower intake. An abundant supply of food, however, does not mean equitable distribution and access in many western European countries (104) (see Chapter 1, pp. 66–73 and Chapter 3, pp. 158–168).

Inequality in food security has led some countries, such as the Russian Federation and Uzbekistan, to initiate specific programmes or policy measures (Table 4.6). Several western European countries, such as France and Germany, acknowledge that they have few data on the dietary patterns of low-income families. Some countries are approaching inequality through more general measures to improve the income and employment levels among poorer families through social security and training programmes.

Considerations for the future

Food insecurity can be considered as both lack of access to appropriate food and the longer-term impact and sustainability of food production practices. Helping to rectify problems of immediate access is probably easier for ministries than guiding the longer-term environmental impact of food production systems on land use, which involves a substantial number of sectors, such as rural development, trade, agriculture, finance and local government. Assessing food access requires identifying how poor and vulnerable people gain access to high-quality foods and whether foods such as vegetables, fruits and fish are available at reasonable prices throughout the year. Undertaking a series of targeted surveys in particular cities or areas may be more helpful than attempting a comprehensive analysis of a whole country. Health promotion groups can help to solve problems of access by identifying local centres and underemployed

Table 4.6. Examples of policy measures for food security and sustainable development

Country	Measures
Austria	Programmes to support organic production
Czech Republic	Support for sustainable farming in uplands Educational projects in schools and training in higher education on sustainable farming Targeted programme for health promotion among the minority Romanian population, especially children
Estonia	Agriculture act (1997) to encourage sustainable farming practices A council formed in 1999 to develop anti-poverty strategies
Finland	Revision of the social assistance act (1998) Reduced use of pesticides and fertilizers National programmes for managing environmental quality and food production
France	Improved programme for school meals Distribution of reduced-price food to low-income families
Georgia	Centre for Nutrition Studies established to coordinate national programmes and improve legal framework
Germany	Development of guidance on good agricultural practices Federal support for organic farming
Ireland	Rural environment protection scheme to promote rural economies and social cohesion Nutrition education projects for low-income women Scheme for free school lunches Community-run cafés and shops
Kyrgyzstan	Training of health personnel to raise awareness of inequality
Norway	National Council on Nutrition and Physical Activity to advise on agricultural production and pricing policies
Russian Federation	Development of new plant varieties for higher yields in stressful conditions Report of a commission to make policies encouraging healthy nutrition for disadvantaged groups: recommendations being adopted
Ukraine	Assistance to low-income families through housing subsidies and social benefits
United Kingdom	Employment action zones and national minimum wage to boost the incomes of poorer families Health action zones to target health inequality
Uzbekistan	National programme on food security (1997)

Source: *Comparative analysis of food and nutrition policies in the WHO European Region 1994–1999. Full report (24).*

people who, with suitable support, can develop local facilities to allow poor people to buy food at affordable prices. Several successful schemes have been introduced in European countries (105).

A number of measures can counteract environmental degradation, including policies on replanting and setting aside selected areas to increase the diversity of flora and fauna. In western Europe, schemes have been established to reduce the contamination of rivers and beaches to comply with new standards for water quality. Similar innovation and modern techniques need to be applied to rejuvenating degraded land and limiting soil erosion. For example, CAP reforms need to consider nutritional health as well as environmental protection (see p. 224), as recommended by Sweden's National Institute of Public Health (2).

An integrated approach: food, health and environment

Fortunately, the strategies needed to create desired changes in nutritional and environmental patterns are often complementary and, as a whole, provide cost-effective, sustainable development for agricultural land (see Chapter 3, pp. 197–200, and p. 224). In addition, local strategies that seek to improve the availability of, access to and consumption of locally produced foods, particularly fruits and vegetables, also increase the interdependence and thus the social cohesion between urban and rural dwellers (see Chapter 3, pp. 205–208).

The United Nations projects that about 83% of the population in the European Region (excluding 10 countries: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Israel, Tajikistan, Turkey, Turkmenistan and Uzbekistan) will live in cities by 2030 (106). Cities produce enormous amounts of waste, which is usually transported as far away and as inexpensively as possible. Urban and peri-urban horticulture businesses have the potential to recycle organic waste, stormwater and treated grey water (any water used in the home, except water from toilets) for use in food production. Urban organic waste (solid waste and wastewater) is a valuable resource that can help to conserve the limited water supply. Moreover, growing and processing fruits and vegetables locally can reduce the energy used in food packaging and transport (105) (see Chapter 3, pp. 178–179).

The current trends in urbanization, combined with the increasing globalization of the food trade, will profoundly affect the sustainability of the food system (107,108). Over the next decade, about 10% of the EU population and 25% of the population in the CCEE will move from rural areas into cities. In 1999, the percentage of the population living in rural areas and working in agriculture was much higher in the CCEE (22.5%) than in the EU (5.5%). Rapid urbanization in the CCEE is therefore likely to be traumatic for both the people left behind and those moving to urban areas in search of jobs. Planners will need to design infrastructure in both urban and rural areas to protect vulnerable people – including unemployed, low-income and elderly people – against food insecurity (105).

A more integrated approach to developing food and environmental plans will help to reduce the stress from rapid urbanization and increased global food trade (107,108). Planners should capitalize on communities' skills, and city authorities should ensure that the appropriate legal, financial, technical and support structures are in place.

Integrated food, health and environmental policies can:

- create opportunities for local employment
- stimulate local economic growth
- strengthen social cohesion
- improve the aesthetics of the city environment
- increase opportunities for more active lifestyles
- improve mental health
- recycle treated water and organic waste for food production
- provide a closer link between consumers and producers
- improve the environment and develop rural areas.

All these advantages lead to more sustainable food, health and environmental systems. In many countries, authorities concerned with community development are beginning to link existing projects or networks, such as Agenda 21 projects; projects of NGOs for poverty alleviation, urban renewal and community and rural development; and networks of the WHO Healthy Cities project.

Identifying the local stakeholders

Successfully developing and implementing local food and nutrition action plans requires the participation of various stakeholders: national authorities, food producers, consumer groups, neighbourhood and environmental groups, schools, community health centres, retailers, markets, banks and authorities responsible for food control and safety. All have a role to play (109). The following questions will help to identify the key stakeholders.

- Who might be affected positively or negatively by the concerns to be addressed?
- What groups may have trouble making their views heard and need special efforts to ensure their inclusion?
- Who are the representatives of those likely to be affected?
- Who is responsible for what is intended?
- Who is likely to mobilize for or against intended action?
- Who can make intended action more effective by participation or less effective by nonparticipation or outright opposition?
- Who can contribute financial and technical resources?
- Whose behaviour must change for the policy to succeed?

Work towards a sustainable future should not be left entirely to policy-makers and technical experts. Broad community involvement is essential in both finding sustainable solutions and facilitating action. Although ensuring such involvement can be daunting, because it consumes both time and resources, it is vital to achieving equitable and sustainable solutions. Finding such solutions requires not only public debate but effective interaction between policy-makers, technical and educational institutions, commercial interests, community groups and citizens.

Analysing problems and assets

Preparing a new policy requires data to clarify the problems that existing food systems create and to determine which potential changes could improve the situation. Thus, a common starting-point is to analyse the existing situation in relation the production of, access to and consumption of healthy foods. Once this is done, an action plan can be designed to meet the population's needs.

Poor availability of and inequitable access to healthy food among vulnerable groups are common problems that create barriers to increasing consumption of a healthy diet, including fruits and vegetables. The best way to increase fruit and vegetable intake is not only to use health education but also to assess and make structural changes to support policy implementation. All action should improve equity, promote local sustainability, empower vulnerable groups and reduce social and health problems and poverty.

Potential opportunity to reduce foodborne risks

Food policies are needed to reduce the spread of foodborne diseases and to reduce the level of perceived health risks. Food production and retailing are increasingly perceived as presenting risks to society in the European Region. Consumers are increasingly concerned about foodborne disease (see Chapter 2) and no longer trust the food supply.

Consumers are increasingly concerned about the microbiological and chemical safety of food, genetically modified foods, novel foods and new processing techniques. Reports of antibiotic resistance, BSE, dioxins and foot-and-mouth disease in animals have damaged their confidence in the safety of what they eat.

Many of the foodborne diseases described in Chapter 2 are associated with intensive agriculture and mass-produced and widely transported and distributed food. Producing more food nearer the consumer could more easily control and perhaps reduce some of the risks. Proper management could eliminate or more easily mitigate foodborne diseases. For example, introducing healthy farmers' markets could have several advantages (105) (see p. 290). In the CCEE, the sale of local food contributes substantially to food security,

particularly the availability of fruits and vegetables, and provides a viable means for local producers to earn extra income.

Barriers to increasing equitable access

Just as the emphasis of food production varies between the CCEE (more subsistence) and western countries in the Region (more commercial or recreational), so do consumers and food consumption patterns. City dwellers in western Europe are predominantly purchasers of value-added processed foods and have little connection with food production. In contrast, about 66% of urban families in the CCEE and NIS produce food. This self-reliance and subsistence farming are likely to change towards the patterns of development in western Europe, with the expansion of the global market (107,108) through, for example, supermarkets and standardization of products. This means that people in the CCEE and NIS are likely to become more dependent on the market-driven food distribution systems. This poses a problem for poor people, who cannot buy their way into this system.

Planners facing increases in city populations should therefore consider alternative food distribution systems and not assume that market-driven systems will cover all needs, especially those needs of people who live in rural areas or on low incomes, and other vulnerable groups. Planners should promote scope for subsistence farming and particularly horticulture in both rural and urban areas.

Barriers to increasing the consumption of fruits and vegetables

As discussed in Chapter 1, most people in Europe, and especially poor and disadvantaged people, do not eat enough fruits and vegetables. The exact reasons must be examined in each situation, but the higher intake in populations in the Mediterranean countries than in northern Europe demonstrates that access and availability are key factors to increasing consumption. Many barriers need to be overcome.

- Some communities may have lost confidence in fruits and vegetables because of scares about pesticide use (see Chapter 2, pp. 129–131), soil contamination and air pollution.
- Taste can be a factor; in particular, children may dislike the taste of vegetables (see pp. 248–249).
- Most research has focused on extending the shelf life of non-perishable value-added foods, instead of perishable food.
- Many consumers now prefer food that is processed, pre-packaged and sold in supermarkets.
- City planners perceive food growing and distribution projects as unimportant and not progressive.

- The community may find some foods culturally unacceptable.
- Many people, especially vulnerable groups, eventually lose cooking skills and cannot cook fruits or vegetables.
- Fresh fruits and vegetables may be too expensive.
- Fruits and vegetables may not be available or accessible.
- Spending more time at work and less at home creates the need for time-saving convenience foods.

Partnerships with retailers to improve access

The supermarket revolution has brought both advantages and unexpected challenges (see Chapter 3, pp. 175 and 196), but city authorities can influence supermarkets' policies. For instance, in the United States, local authorities have successfully encouraged supermarkets to enter the poorer areas of large cities, and the concept of neighbourhood supermarkets that sell local produce is being promoted. Good cooperation between supermarkets and the health and voluntary sectors, both in the United States and Europe is leading to increased sales of fruits and vegetables.

Many services provided by supermarkets can greatly improve their customers' access to fruits and vegetables:

- increased variety of fresh fruits and vegetables for sale;
- wheelchairs and walking assistance;
- the availability of small, reasonably priced packs and unpackaged, affordable fruits and vegetables, sold singly for small households;
- free bus service to and from supermarkets;
- loyalty cards or stamps that offer discounts on fruits and vegetables; and
- home delivery service.

Food retailers, especially supermarket chains, are a dominant force in shaping the preferences and demand for goods (108,109). Large retail distribution chains often build very large central terminals for produce from all over the world. From here trucks deliver to the shops belonging to the distribution chain. This does not encourage these shops to stock locally grown produce. Attempts to reverse this trend are being tested in some cities. For example, supermarkets in Mikkeli, Finland, sell locally grown and processed foods that are promoted by special shelf signs advertising "provincial products".

The exponential growth and high-profile promotional campaigns of supermarkets in the CCEE are likely to influence consumption patterns substantially. Such changes are not inevitable (see Chapter 3, Fig. 3.5, p. 166). Several factors shape dietary change: policies on food supply, pricing and technology, activities to promote products and public health messages. A combination of

consumer demand and commercial investment in mass production and promotion largely determines the direction of change.

Patterns of change differ with circumstances. For example, 60% of the direct foreign investment in the food sector in the CCEE during the 1990s was in confectionery and soft drink production and less than 6% in fruit and vegetable production. Ministries should attempt to work with food retailers to develop new health promotion strategies to limit the damage from these trends.

Mechanisms to help health ministries set priorities for future action

From science to policy-making

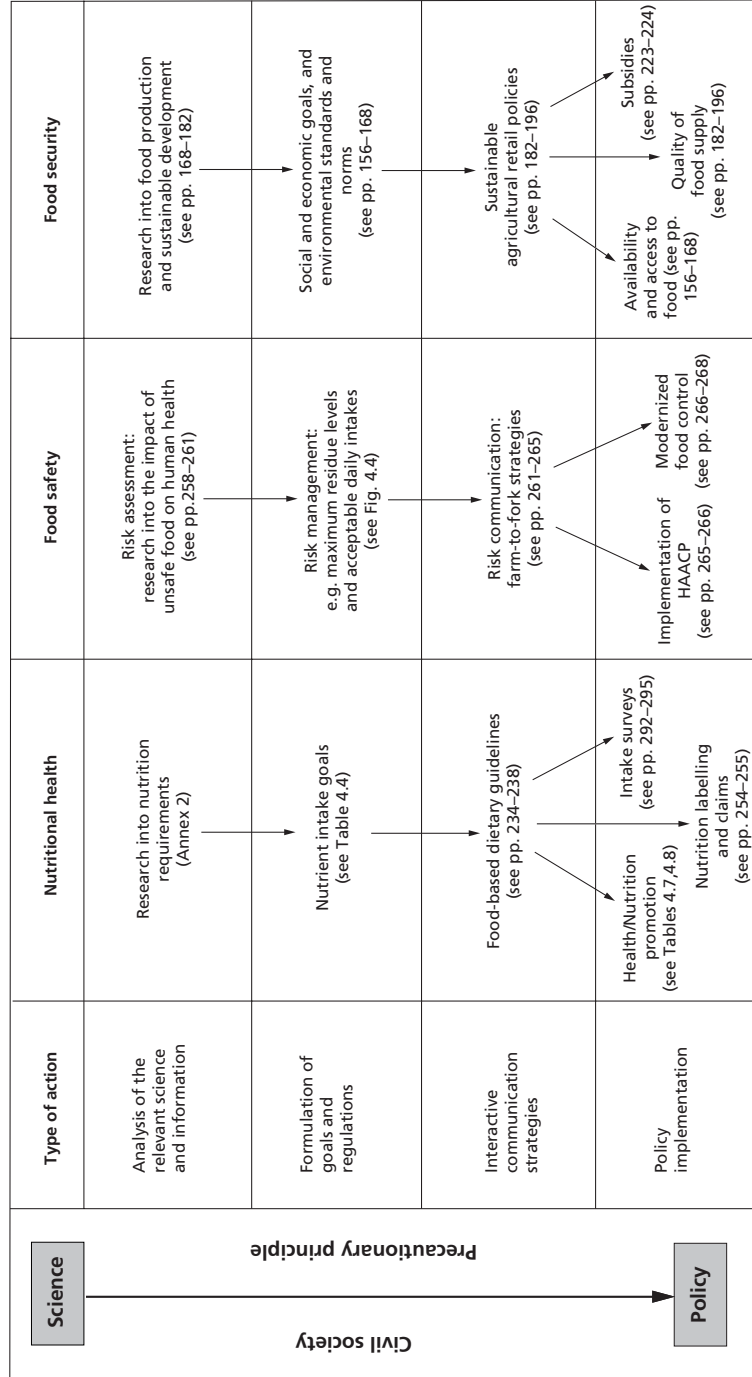
This book depends greatly on scientists' interpretation of available data: material from large-scale surveys, international bodies and peer-reviewed scientific journals. The scientific evidence showing the relationships discussed here forms only part of the argument needed to provide policy-makers with a basis for action.

Scientists have the skills to generate testable theories, develop methods for measuring and evaluating and show statistical relationships. Policy-makers have the skills to negotiate between conflicting interests and to draft, enact and ensure the enforcement of legislation. Between the two lies the problem of how scientific findings are fed into the policy process (Fig. 4.5).

Scientific advisory committees play the key role, interpreting the current scientific evidence and giving opinions for policy purposes, but they have been criticized for biased views, narrowness of focus and a lack of transparency. In response, national and international scientific committees are becoming more open. Members are being asked to declare their commercial as well as their academic interests. Non-scientific members, such as consumer representatives, are being invited to participate. Further, the methods for evaluating scientific evidence are becoming clearer and more tightly structured, and such evaluation is becoming a well developed science. The sensitivity of theories and models can be assessed by checking on the importance of the various assumptions and the robustness of the predictions. Evidence can be ranked in importance according to agreed criteria, such as the methods used in the research, the size of the sample and the replication of the findings.

Decisions, however, are not based on evidence alone. Evidence is often inadequate: for example, there was little evidence of a link between BSE and any human disease during the late 1980s and early 1990s, yet precautions were advised and proved to be greatly needed. Evidence often has significant shortcomings, and more data inevitably accumulate in subsequent years. Thus, a precautionary approach is always recommended.

Fig. 4.5. Steps in developing and implementing policy



Further, there can only be evidence on what is or what was, not what might be. Scientific evidence can show differences and trends and the results of tests and trials, but not the results of an action before it is taken. Policy decisions cannot therefore be based entirely on evidence but must rely on a combination of the best available evidence with predictions and assumptions. These can be, for example, organized into methods of health impact assessment to evaluate the health effects of proposed policies, programmes and projects (see pp. 289–292).

Some countries have mechanisms for providing information on nutrition, food safety and food security (23,24), but few have explored how best to integrate scientific evidence from the agricultural and environmental sectors with that from health analyses. Agricultural policies since the Second World War have dealt mainly with food production, while health policies have dealt mainly with health care and treatment and health education. Developing integrated policies requires evolving systems for ensuring closer interaction between both scientists and policy-makers in health, agriculture and the environment.

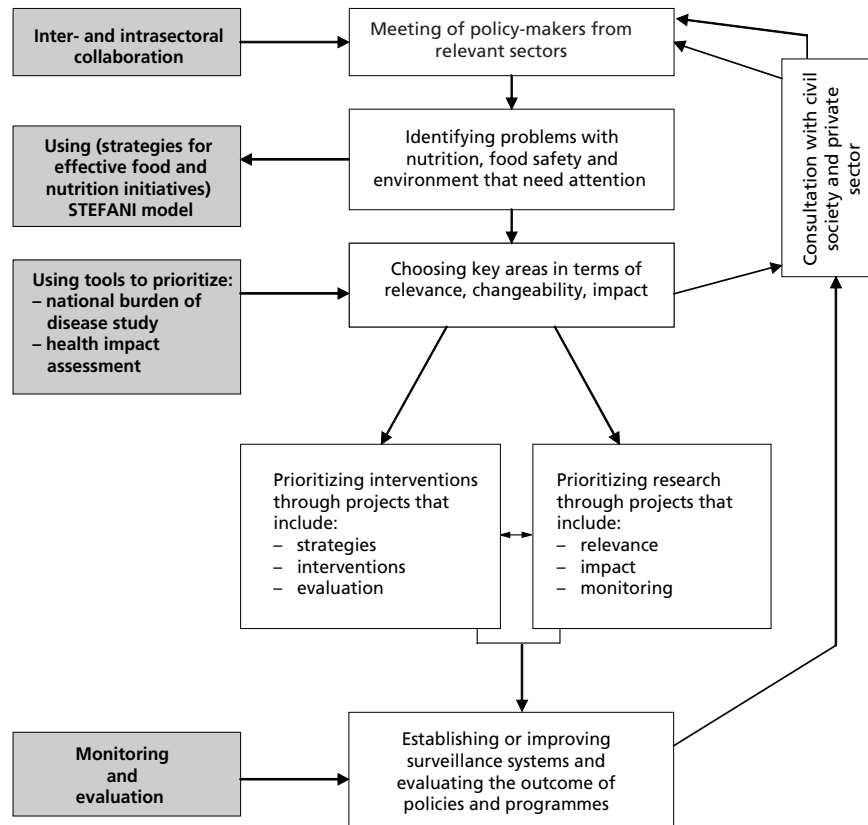
In 1997, the EC developed new mechanisms whereby a scientific committee would evaluate the health aspects of the environment, agriculture and other societal activities, and publish the agendas and minutes of its meetings and its numerous opinions on the Internet and through press conferences. Special scientific bodies are needed to analyse the evidence and to make recommendations for policy ensuring the involvement of civil society. The emergence of a huge range of bodies within civil society means that the mechanisms of developing and implementing policy need to be rethought, as outlined in a publication on the nature of global governance (110).

Fig. 4.5 illustrates some of the steps required between science and policy development and implementation in relation to nutrition, food safety and food security. A similar process is warranted in all three areas: analysis of the relevant science and information, formulation of regulations and control mechanisms and transmission of this information to citizens, using the precautionary principle (see pp. 261–263), in an interactive way involving dialogue and feedback from all stakeholders.

Fig. 4.5 brings together the three main issues that have been discussed individually in previous sections of this chapter. This section illustrates how a ministry can develop an integrated, comprehensive food and nutrition policy that attempts to find sustainable solutions to many of the public health concerns highlighted in Chapters 1–3. Fig. 4.6 outlines a proposed process to help governments set priorities among their activities, recognizing that everything cannot be tackled at once. Nevertheless, a written policy must be developed that comprehensively describes all the problems before policy-makers

decide where major new efforts should begin. Identifying national assets and building new policies around them are especially important.

Fig. 4.6. A proposed process for governments to use in setting priorities for action



Source: inspired by Swinburn et al. (40).

Fig. 4.6 proposes an approach for health and other relevant ministries to use in developing policies and identifying priority areas within food and nutrition. It involves:

- taking a multisectoral approach;
- identifying problems that call for scientific research or health promotion intervention through the strategies for effective food and nutrition initiatives model (see Table 4.7);

- setting priorities, with the help of such tools as assessment of health impact or the relative burdens of different diseases, and then agreeing on intervention projects or research activities; and
- monitoring and evaluation.

Objective, reliable data are essential for policy-making and should be generated by national health information systems. Mechanisms for process and outcome evaluation must be created to ensure that the policies tackle the problems that place the heaviest burdens on society and individuals.

Intra- and intersectoral collaboration

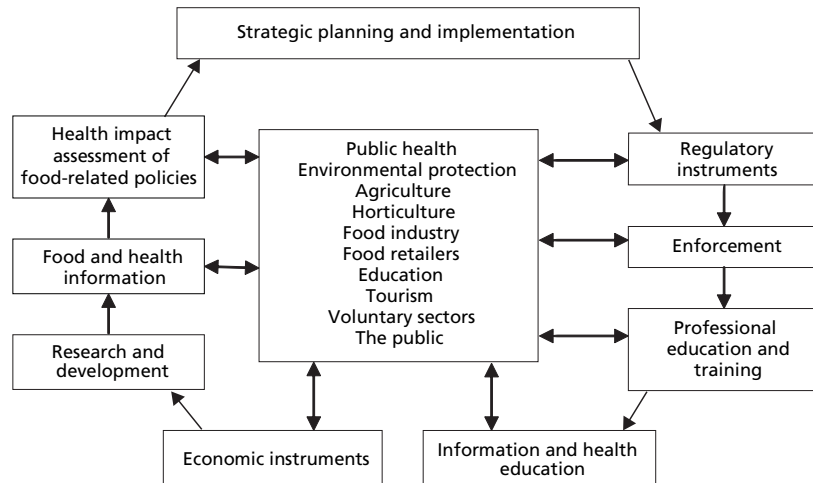
One of the first steps in developing an integrated and comprehensive food and nutrition policy is to ensure good collaboration between nutrition and food safety experts working in the health sector. The general public perceives food holistically, and sees only academic differences between food safety and nutrition. People want good, wholesome food that they can enjoy without fear.

Interestingly, in the European Region, nutritionists and food safety specialists seem to work more closely together in the CCEE and NIS than in other countries. There may be several reasons for this. For example, nutrition is a relatively new science, and in the CCEE and NIS its evolution is closely linked to hygiene, ecology and the sanitary-epidemiology system. Specialists in nutrition and food hygiene evolve from the same postgraduate medical specialization. Moreover, the responsibility for food safety lies with health ministries in the CCEE and NIS but has been transferred to agriculture or other ministries in many other countries. With the increasing food safety scandals in western Europe, however, health ministries are taking a more proactive role in protecting public health and food safety.

Coordination between public health specialists working in food safety and nutrition is important for many reasons. For example, nutritionists encourage consumers to eat more lean meat, fish, fruits and vegetables, whereas consumers and food safety experts may express concern about increasing levels of *Salmonella* and *Campylobacter* (in chicken), dioxins (fish) and pesticides (fruits and vegetables). Health ministries are responsible for ensuring that all public health specialists deliver the same consistent and reliable information to consumers. Closer cooperation between nutritionists and food safety specialists can prevent the dissemination of conflicting or confusing messages. In addition, the health ministry can build the trust of civil society if it actively seeks citizens' opinions through NGOs and the voluntary sector. The opinions of the private sector must also be included, and one of the difficulties in developing intersectoral policies is stakeholders' level of commitment to public health versus their own economic or other interests. Intersectoral policies will probably

not be implemented unless all stakeholders are committed to the process (Fig. 4.7).

Fig. 4.7. Collaboration of sectors in developing and implementing food and nutrition policy



Public health specialists dealing with food safety and nutrition have to learn how best to strengthen their collaboration with other sectors such as agriculture and the food industry, including wholesalers, retailers and caterers. Consumers have an interest in supporting the supply of high-quality, nutritious and safe food, and the food industry has an interest in supplying what consumers want. This gives the health sector a good opportunity to strengthen alliances with NGOs concerned with food and public health. Unfortunately, the WHO comparative analysis of nutrition policies (24) provided little evidence of such alliances, except in Hungary, Norway, Poland and Sweden.

Strategies for effective food and nutrition initiatives (STEFANI)

The STEFANI model is a framework developed for policy-makers to use in setting priorities among intervention projects and research. The model was inspired by the analysis grid for environments linked to obesity (ANGELO) framework (37), which aims to analyse factors that promote overweight and obesity and set priorities among areas for intervention and research. The ANGELO framework is diagnostic, covering elements that influence

behaviour. The STEFANI model is a framework for action that includes a wide range of interventions.

The STEFANI model (Table 4.7) examines four main settings – physical, economic, policy and sociocultural – against three main sectors – nutrition, food safety and food security, to determine action that health and other ministries can take.

The physical setting comprises what is available in the infrastructure (such as school canteens or football fields), capacity-building opportunities (such as nutrition and exercise expertise) and information (such as food labels). The economic setting is composed of financial factors: both the related costs (for example, for building bicycle paths or subsidizing fruits and vegetables) and the income available to pay for them (for example, taxing saturated fat (*III*) and using the additional revenue on public health campaigns). The policy setting covers rules, legislation and recommendations (such as whether the government has endorsed HACCP (see pp. 265–266) or national dietary guidelines have been developed). Finally, the sociocultural setting comprises attitudes, perceptions, values and beliefs that characterize certain societal groups (such as the acceptability of breastfeeding in public or mistakenly feeding infants tea, or the belief that organic food is healthier). All these settings significantly affect the behaviour of individuals and organizations and must be addressed before areas for intervention and research can be identified.

Table 4.8 gives examples of how a health ministry can systematically analyse problems and initiate action by, for example, reassessing funding priorities, making new legislation or developing innovations in public information or citizen participation.

Other ministries may be responsible for many of the required actions, and the health ministry will therefore need strategies for interacting with them. Successful policies in the European Region suggest that health ministries can exert considerable influence if they have the evidence to ensure that the public, professional groups and politicians understand the need for integrated and comprehensive food and nutrition policies.

Table 4.8 includes some aspects of food and nutrition policy that can be carried out by the health sector at the national and local levels. It covers a series of issues relating to the whole lifespan. The policies listed may involve changing physical facilities, reorienting economic priorities or taking educational or sociocultural initiatives. In addition, health professionals need to develop schemes that require multisectoral solutions. Tables 4.7 and 4.8 systematically set out some of the many initiatives that are needed to improve nutritional health, ensure food safety and sustain the environment. This is not a complete portfolio, but it is hoped that this scheme may stimulate discussion on different policy options.

Table 4.7. The STEFANI model: examples of action by ministries in different settings

Settings	Action by health ministry		Action by other ministries	
	Nutritional health	Food safety	Nutritional health	Food safety
				Food security and sustainable development
Physical: what is available?	Appropriately accessible health centres Promotion of access to appropriate self-monitoring systems, for example, for weight and blood pressure Providing information on disease prevention	Catering in hospitals Monitoring facilities Health information systems Food control	Playgrounds in schools, suitable cycling and road systems, urban planning, sports facilities Designated urban areas for local food production	Urban planning: green spaces, cycle paths, parks, playgrounds, lead-free soil Facilities for farmers' markets Facilities to support breastfeeding in shops, etc.
Economic: what are the financial factors?	Primary health care staff paid to give advice on disease prevention	Penalties for providing unsafe food	Re-evaluating taxation and subsidy policies Support for low-income groups	Reformed agricultural subsidies Financing of new public transport systems Promotion of urban agriculture
Policy: what are the rules, legislation, and recommendations?	Baby-friendly hospitals Dietary guidelines Fortification policies Policies on health claims, for example, for functional foods	Assessment of health impact of agricultural policies Consideration of consumers' concerns in food safety policy	Assessment of health impact of CAP Food labelling with appropriate, understandable health-related information	Reformed agricultural subsidies Policies on: soil improvement, clean water, agricultural recycling, planting and use of fertilizer, pesticides and water Paid maternity leave
Sociocultural: what are the attitudes, perceptions, values and beliefs?	Health education Community activities Promoting cycling and walking and building appropriate paths	Promotion of concept of limited clinical antibiotic use Maximum residue limits and acceptable daily intakes Publicizing of results of food hygiene inspections	Promotion of physical activity in the workplace Creation of time and space for breastfeeding in the workplace, with the help of NGOs	Positive attitudes to cycle path use and pedestrian areas Educational initiatives for caterers, use of school recreational facilities by the community

Table 4.8. Potential action for health ministries

Professional groups	National level		Local level	
	Nutritional health	Food safety	Nutritional health	Food safety
		Food security and sustainable development		Food security and sustainable development
Health professionals dealing with the perinatal period, such as obstetricians, gynaecologists, midwives, paediatricians, primary health care physicians and paediatric nurses	Audit of policies on anaemia, weight gain, optimum diet in pregnancy and breastfeeding initiatives for baby-friendly hospitals. Policy on feeding infants and young children	Policies advising pregnant women on such topics as avoiding listeriosis, salmonellosis and toxoplasmosis. Monitoring food hygiene. Surveillance policies	Optimum techniques for limiting low birth weight, anaemia, pregnancy diabetes and neural tube defects; breastfeeding strategies. Breastfeeding within 1 hour of birth. Informing parents on complementary feeding	Antenatal education including as food hygiene and preventing toxoplasmosis. Leaflets and posters to inform the public
Health professionals dealing with children and schools, such as paediatricians, school medical officers, paediatric and school health visitors	Promoting physical activity in preschools and schools. Policies with the education ministry, to monitor children's weight and BMI. Training of school nurses and canteen staff on healthy diets	Policies to reduce access to unhealthy food (such as vending machines) and to increase access to healthy food	Monitoring of iodine levels of the population. Promotion of consumption of iodized salt, with education on the need to limit intake. Policies to reduce vending machines in schools and to limit availability of soft drinks and sweets	Monitoring of hygiene standards of preschool and school canteens. Tackling parasitic diseases (providing anthelmintic treatment). Comprehensive food and nutrition policies for schools. Promoting a network of health promoting schools

Table 4.8 continued

Professional groups	National level		Local level	
	Nutritional health	Food safety	Nutritional health	Food safety
				Food security and sustainable development
Health professionals dealing with adolescents, such as physicians in primary health care, community centres and schools, gynaecologists and school nurses	Policies on weight control, healthy eating and physical activity in schools and community centres, with adolescents as decision-makers Teachers and health professionals educated on adolescents' dietary and psychosocial needs	Policies for food hygiene in places where adolescents spend time	Projects on diet, physical activity and health Policies on anaemia in adolescence and in teenage pregnancy	Policies to create green spaces around schools and community centres Support for policies to maintain parks and recreational facilities
Health professionals dealing with adults, such as primary health care physicians and adult specialists	Nutrient reference values and food-based dietary guidelines Health professionals educated on adults' dietary needs	Policies to ensure hygienic canteens at workplaces	Consistent information from health professionals on a healthy diet Monitoring patients' BMI	Support for policies to improve public transport, particularly to increase accessibility to farmers' markets and shops Support for urban planning policies that create safe bicycle paths
Health professionals dealing with older people, such as geriatricians and nursing home personnel	Policies to promote physical activity (especially weight bearing) via nursing homes, caregivers and community centres	Geriatricians and nursing home personnel educated on the susceptibility of the immune system in relation to food Monitoring of food preparation and hygiene in nursing homes and hospitals	Regular monitoring by health professionals of bone density and micronutrient and macronutrient deficiencies	Clean and safe communal rooms in hospitals for older long-term inpatients

Public health professionals	Start and monitoring of a range of public health initiatives involving both hospital and community policies Policy on nutrition labelling and health claims	Specific responsibilities assigned for dealing with acute food safety problems Food control services Support for farmers' markets	Toxicological monitoring and evaluation of any possible environmental health problem Support for the development of farmers' markets	Promoting demonstration projects, for example, for physical activity and dietary change in the community	Criteria for giving quality marks to companies of various sizes, based on auditing food hygiene practices	Environmental audits for all factories with water effluence, and spot checks on potential lead contamination in local waste disposal centres, and of soil contamination, especially for urban agriculture projects
Public health professionals dealing with refugees, internally displaced persons and migrant populations	Policies for proper training of volunteers and health staff on the particular needs of refugees and internally displaced persons Policies for regularly monitoring nutritional health Health professionals educated on the special dietary needs of migrant populations	Policies to provide refugees with proper tools for food preparation Training of professionals on proper water purification	Support for policies that create a "sustainable" infrastructure in a refugee camp Support for NGOs working to integrate and support refugees in a host country	Policies to provide oral rehydration therapy and nutrient-rich supplements and foods to refugees in camps Monitoring of refugees for anaemia Support for monitoring of BMI and micronutrient deficiencies of migrant populations, especially children	Policies to tackle parasitic diseases: monitoring hookworm and other helminth infestations and providing anthelmintic treatment Provision of chlorine drops or other water purification methods	Support for the creation of community centres and physical activity spaces for children and adults Support for initiatives that provide free language classes and special support services to refugees in a host country
Hospital staff	Consistent policies on food and nutrition during illness Membership of network of health promoting hospitals	Policies to prevent or deal with food poisoning outbreaks	Policies on healthy catering, and places where patients and staff can eat Policies to prevent undernutrition in patients	Consistent information and advice available on diet and physical activity	Implementation of food safety regulations	Monitoring of the eating environment of patients Food purchased from local producers

Policy-makers can identify priorities by asking questions.

- Is the issue a great public health problem?
- Is it amenable to change?
- What is the estimated impact if a solution is found?

They can use the answers to rank each problem and thus identify the top priorities. This may give policy-makers ideas on how to strengthen existing interventions or begin new ones. They may need more data before proceeding to intervention (thereby calling for more research) or decide that further consultation is needed before any priorities can be set.

Suggested methods for setting priorities

The global burden of disease and disability (112) can be analysed at the national level to decide the appropriate setting of priorities. In addition, different types of health impact assessment, prospective and retrospective, can be made to help identify which policies need changing (113). These are two structured ways of compiling evidence, evaluating, working in partnership and consulting the public for more explicit decision-making.

Estimating the national burden of disease

Outlining a scheme here for analysing the burden of disease is inappropriate. Interested readers may refer to Murray & Lopez (114), the updated analysis of the global burden of disease (<http://www.who.int/oeh/OCHweb/OCHweb/OSHpages/GlobalBurdenProject/WHOProject.htm>, accessed 22 October 2002) and established systems for estimating the contribution from important risk factors. WHO has published an overview of the risk assessment methods used to estimate the current and future disease burden (112).

Earlier analyses of the global burden of disease (114) excluded issues relating to food safety, except for infant diarrhoeal disease. Infectious diarrhoeal disease is a major global killer, but its total burden in western Europe is about one third of that attributable to diabetes, a sixth of that from stroke and about only one fifteenth of that from CHD. In many countries in the European Region, nutrition-related diseases therefore have a far greater impact than unsafe food on the prevalence and incidence of disease. Nevertheless, health ministries are aware of the political dominance of food safety, which stems principally from two factors:

- the huge economic implications of the public's sudden aversion to eating a particular range of foods as a result of a food scandal; and
- the intense public concern, often perceived as irrational by scientists, that arises as a result of deaths from *E. coli*, botulism, typhoid or vCJD.

The reaction to the *E. coli* and vCJD outbreaks and the intense concern about GMOs (Chapters 2 and 3) are responses from a public that feels it no longer has access to safe food. They are understandable, although scientific analyses indicate that people should be far more concerned about chronic health problems such as CVD and obesity. Health ministries, in addition to dealing with political concerns, are encouraged to ensure that health surveillance systems allow the main causes of premature death and disability in society to be evaluated.

Some European institutions are analysing the national disease burden. A group in the Netherlands (115) concluded that the country's burden of disease could be assessed in DALYs (see Chapter 1, pp. 7–8). Ideally, this approach should be carried out in each country in the WHO European Region to enable priorities for health policy to be determined.

Health impact assessment of food-related policies

Interest in addressing the determinants of health that lie outside the health sector is increasing. Health impact assessment is a process that identifies both the positive and negative effects of policies on health and includes recommendations to improve policies to maximize the health benefit to the population (116).

Health impact assessment is a proactive way to improve health, to promote equity in health and to increase the transparency of decision-making. An exciting aspect of a systematic approach to health impact assessment is its potential to prevent future harm and maximize future benefit. The health impact of a proposal can be assessed prospectively, including recommendations on how to adjust policies to enhance health gain (117).

Food production can influence health in many ways besides effects on nutrition and food safety. These other influences may be either beneficial or harmful. For example, food production plays a significant part in local economies, creating employment and social cohesion (118). It may affect transport patterns, either improve or damage the physical environment (119) and pose occupational hazards to agricultural and other workers (120). These other influences should be recognized in advocating a healthy food policy. Gaining an understanding of all the ways a policy may influence health requires systematic assessment of the overall health effects (121).

Most policies have different kinds of health effects: some positive and others negative. Health impact assessment should make all these trade-offs explicit and thus make decisions more transparent. An example is the debate on appropriate policies on local food markets. Local markets are important in ensuring a sustainable food supply, safeguarding local employment and minimizing food transport and may strengthen community cohesion (118,119). These are all important health benefits. However, regulating these markets

and ensuring that food hygiene procedures are robust are often difficult. This is potentially a serious health hazard (122). This situation can lead to conflict between those responsible for food safety and those trying to promote local farmers' markets. Health impact assessment would identify the potential effects, comparing different policy options and allowing these different effects to be taken into account in policy-making (123).

A consensus paper from a WHO seminar on health impact assessment in Gothenburg, Sweden in 1999 (116) aims to create a common understanding of health impact assessment, to clarify some of the main concepts and to suggest an approach to health impact assessment. It defines health impact assessment as a combination of procedures, methods and tools to assess the potential effects of a policy, programme or project on the health of a population and the distribution of these effects within the population. The paper proposes the following core elements of health impact assessment:

- consideration of evidence about the anticipated relationships between a policy, programme or project and the health of a population (both the total population and population groups);
- consideration of the opinions, experience and expectations of those who may be affected by the proposed policy, programme or project;
- provision of more informed understanding by decision-makers and the public regarding the effects of the policy, programme or project on health; and
- proposals for adjustments or options to maximize the positive and minimize the negative health effects.

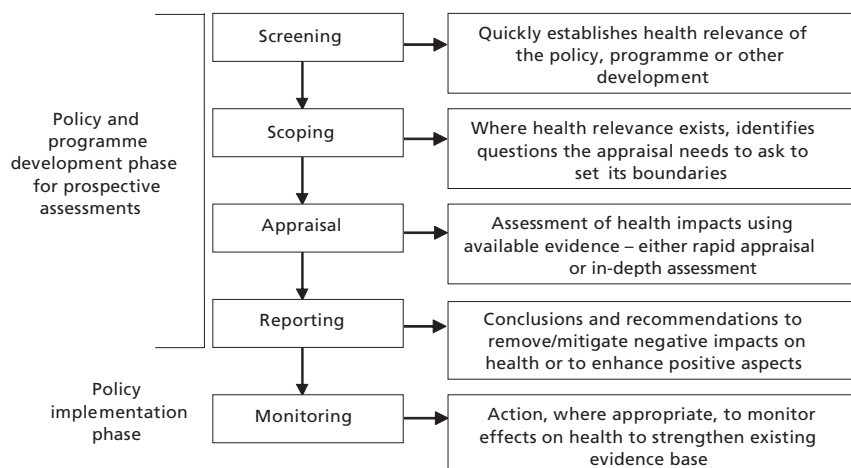
Fig 4.8 illustrates the main stages in the process of health impact assessment.

An essential first stage is the systematic screening of policies and programme proposals. In practice, the next stage may not be sequential but iterative, with some steps being repeated as questions and potential health effects emerge from the various stages. The appraisal stage includes qualitative and quantitative assessments that cover both risks and hazards to health, and can take the form of rapid appraisal done over a few days or an in-depth appraisal lasting weeks to months. The conclusions are reported to those responsible for the development process. Where appropriate, the effects of a policy or programme on people's health and wellbeing should be monitored (124).

Integrating health impact assessment into the policy cycle

Health impact assessment should be a way to ensure that the health consequences of policies are not overlooked. It should raise awareness of the possible unintended effects of a wide range of policies. For this to happen, assessment should not be ad hoc, but part of everyday policy-making

Fig. 4.8. Overview of the main stages in the process of health impact assessment, their functions and relationship to developing and implementing policy



Source: Breeze & Lock (124).

(116,121). Mechanisms are needed to identify the policies that should be subjected to health impact assessment and to ensure that it is done when they can still be changed. This implies that awareness of health effects is needed at all stages of the policy-making process. Three main types of health impact assessment (124) have been described: prospective, retrospective and concurrent.

Prospective assessment is undertaken during the development of a new or revised policy or development. It aims to consider and, if possible, predict the effects on health and wellbeing that might be expected as a result of implementing the policy and to identify corrective measures that could prevent or mitigate these effects.

Retrospective assessment looks at the consequences of a policy, programme or other development that has already been implemented or the consequences of an unplanned development or event.

Concurrent assessment assesses health effects as the policy or programme is being implemented. It is mainly used when effects are anticipated but their nature and/or magnitude is uncertain. It allows the implementation of a policy or programme to be monitored and the results to be fed back for prompt corrective action.

In food policy, the best known examples are assessments of the health impact of CAP by Sweden's National Institute of Public Health (2,125). They

show the potential for agricultural policy to affect health and indicates the range of methods and disciplines that are needed in trying to assess the effects. The policy analysts required skills in public health and health policy research, and in consumer affairs, agriculture, food policy and sociology. Further, systematic health impact assessment of food and agriculture policies is urgently needed; Slovenia, in particular, has had a pioneering role (126).

Trends in nutrition and food safety change and vary across the European Region (127). Health impact assessment should take account of the local context, and the evidence should be appropriate to the situation. In addition, new evidence may change the understanding of health. For example, health impact assessment of the agricultural policies after the Second World War would probably have supported most of them: food shortages threatened population health, and agricultural policies were designed to ensure food security (128). As a result, intensive methods of agriculture have lessened the risk of food shortages but may be contributing to food scares and the prevalence of CVD, cancer and obesity. The agricultural policies predominant after the Second World War may not be the best way to improve food security and health in the future (see Chapter 3).

Monitoring and evaluation

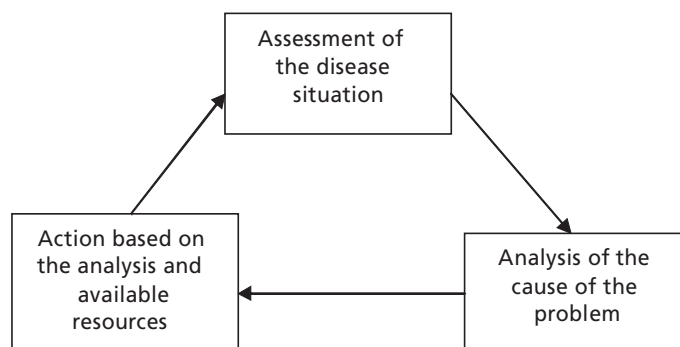
Objective, reliable data are essential to compare regions or countries, to provide the basis for testing the impact of change, to monitor progress over time and, ultimately, to be the basis for policy decisions. Health information systems generate data; they should be able to detect the existence of a problem, act as a mechanism for identifying the causes and solutions and provide an effective way to communicate this to the people responsible for taking action (Fig 4.9). For example, steps might include identifying socioeconomic groups with a high prevalence of CVD (assessment), investigating the reasons for elevated rates among these groups (analysis) and recommending appropriate public health programmes targeting them (action) (129).

Monitoring

The limited amount of information included in Chapters 1–3 shows the paucity of data, and the desperate need to improve information on food and health. New national food agencies are emerging all over Europe (87), and they could be asked to collect more health-related food information. National food safety agencies collect intake data to get information on sources of contaminated food. These surveys could also be used to collect information on food and nutrient intake, thus making cost-effective use of limited resources.

A project on the European Food Consumption Survey Method (EFCOSUM) (130), funded by the EU, was undertaken to contribute to a European

Fig. 4.9. Health information systems



Source: adapted from Jonsson (129).

monitoring system that includes measurement of health status and trends in and determinants of health. A standardized method was defined for monitoring food consumption in nationally representative samples of all age and sex categories in a comparable way. A total of 23 countries in the European Region participated.

The EFCOSUM findings emphasize the need for coordinating surveillance activities in the Region. The project revealed a huge diversity of approaches to assessing dietary intake on an individual level, as do the data collected by WHO (Table 4.9). As a consequence, the data sets on dietary intake available at the country level are not directly comparable.

As a first step in harmonization, the EFCOSUM Group decided that existing data from 15 countries can be made comparable at the food level, but much remains to be done. The data from household budget surveys of 13 European countries (131) can fulfil the needs of the EC's health monitoring system at the food supply level (the software can be found on the Internet (<http://www.nut.uoa.gr/english/>, accessed 16 September 2003)), but data at an individual level are recommended to study the relationship between diet and health and properly to identify risk groups.

The EFCOSUM project demonstrated a broad European consensus on the basic components of an individually based dietary monitoring system. The consortium of 23 countries not only created a general outline of methods and indicators but also proved the feasibility of carrying out a European survey. It was recommended that any country carrying out a national food consumption survey include the minimum number of 24-hour dietary recalls that allows calibration with other countries (130). The EFCOSUM project provides good recommendations for a standard method for national food consumption surveys in the European Region.

Table 4.9. Methods of collecting dietary information used in selected European countries

Country	Years of collection	Method
Andorra	1994–1995	Household budget survey linked with individual 7-day records
Austria	1998	24-hour recall
Azerbaijan	1994–1995	24-hour recall
Bulgaria	1998	24-hour recall
Croatia	1990	Household budget survey
Denmark	1995	7-day food record
Estonia	1997	24-hour recall
Finland	1997	24-hour recall
France	1994–1997	24-hour recall
Ireland	1990	Dietary history
Kazakhstan	1996	24-hour recall
Latvia	1997	24-hour recall
Lithuania	1997	24-hour recall
Iceland	1990	Dietary history method
Netherlands	1997–1998	2-day notebook method
Norway	1993–1994	Food frequency questionnaire
Portugal	1980	24-hour recall
Slovenia	1997	24-hour recall and food frequency questionnaire
Sweden	1989	7-day food record
Ukraine	1997	Express 1-day and 7-day questionnaires
United Kingdom	1986–1987, 1992–1993, 1994–1995	4-day weighed intake inventory

Source: *Comparative analysis of food and nutrition policies in the WHO European Region 1994–1999. Full report (24).*

Surveillance of foodborne diseases is a high priority on the public health agendas of many countries. It is instrumental for estimating the burden of foodborne diseases, assessing their relative impact on health and economics and evaluating programmes to prevent and control them. It allows rapid detection of and response to outbreaks, and is a major source of information for risk assessment, management and communication. Data from foodborne disease surveillance could be integrated with food monitoring data along the entire food chain. This would result in strong surveillance information and could allow appropriate priority setting and public health intervention. Collaboration between sectors and institutions is of paramount importance.

The WHO global strategy on food safety (132) and resolution EUR/RC52/R3 of the WHO Regional Committee for Europe on food safety and quality (http://www.euro.who.int/AboutWHO/Governance/resolutions/2002/20021231_10, accessed 16 September 2003) recognize that the surveillance of foodborne diseases should have high priority in the development of food safety infrastructure. Building capacity for public health laboratories to conduct surveillance and for conducting epidemiological surveillance is an important public health objective. A global approach needs to be developed and coordinated to strengthen surveillance at the national, regional and global levels. Foodborne disease reporting should be integrated into the revision of the International Health Regulations.

Evaluation

Surveillance systems can measure whether an intervention produces the desired changes in mortality or morbidity, but results are not achieved until several years after a policy is implemented. In contrast, process evaluation monitors how a policy or intervention is implemented. A process evaluation assesses how a health initiative achieves its effects, and includes evaluating the resources used and describing the activities implemented and outputs achieved (intermediate outcomes and proximal effects) (133).

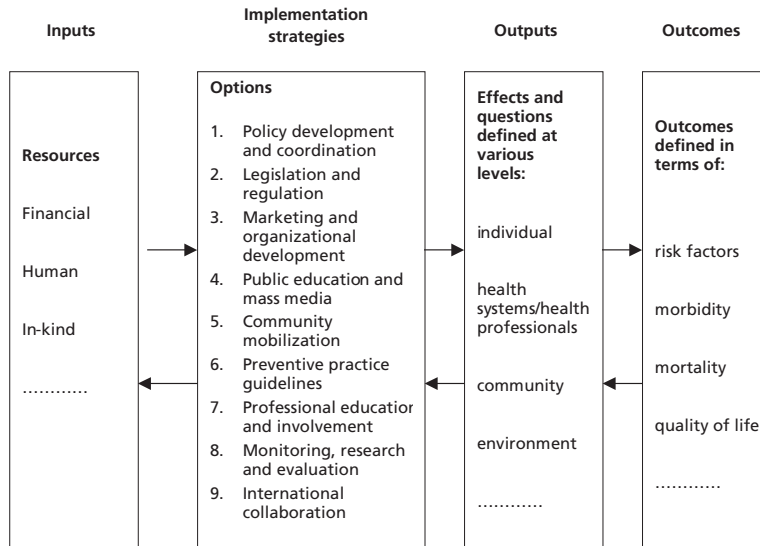
Several considerations drive the process evaluation of any project or initiative (133):

- the project's overall goal, specific objectives, strategies and target populations;
- the scope and level of the evaluation (national, regional or local); and
- the cost and practicality of gathering various types of data.

Fig. 4.10 shows how process evaluation fits into the broader context of an evaluation framework. Inputs are converted into outputs via implementation strategies, and feedback mechanism among the various processes, inputs and outputs facilitates this process.

A useful tool for policy-makers is a WHO publication (134) that summarizes the core features of approaches for the evaluation of health promotion initiatives: participation, multiple methods, capacity building and appropriateness. Table 4.10 presents recommendations to policy-makers.

Fig. 4.10. A framework for process evaluation



Source: adapted from *Handbook for process evaluation in noncommunicable disease prevention* (133).

Table 4.10. Health promotion evaluation: conclusions and recommendations to policy-makers

Conclusions	Recommendations
Those who have direct interest in a health promotion initiative need the opportunity to participate in all stages of its planning and evaluation.	Encourage the adoption of participatory approaches to evaluation that provide meaningful opportunities for involvement by everyone with a direct interest in health promotion initiatives.
Adequate resources are needed for the evaluation of health promotion initiatives.	Require that a minimum of 10% of the total financial resources for a health promotion initiative be allocated to evaluation.
Both the processes and outcomes of health promotion initiatives need evaluation.	Ensure that a mixture of process and outcome information is used to evaluate all health promotion initiatives.
The use of randomized controlled trials to evaluate health promotion initiatives is inappropriate, misleading and unnecessarily expensive in most cases.	Support the use of multiple methods to evaluate health promotion initiatives. Support further research into the development of appropriate approaches to evaluating health promotion initiatives.

Table 4.10 continued

Expertise in the evaluation of health promotion initiatives needs to be developed and sustained.	Support the establishment of a training and education infrastructure to develop expertise in the evaluation of health promotion initiatives. Create and support opportunities for sharing information on evaluation methods used in health promotion through conferences, workshops, networks and other means.
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Source: *Health promotion evaluation: recommendations to policy makers. Report of the WHO European Working Group on Health Promotion Evaluation (134).*

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