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Food policies: a threat to health?

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Food policies deliver large quantities of food relatively safely, but they are failing to deliver healthy diets. Policies fall into three broad categories: the supply of sufficient amounts of food (food security); the provision of food free from contamination (food safety); the provision of a healthy diet available to all (nutritional quality). These three aspects are dealt with by institutions that rarely engage with each other, let alone coordinate their strategies. Greater financial support has been given to agricultural policy than to any other joint EU endeavour. In the last decade food safety has dominated headlines and has influenced recent changes to EU food policies. New food authorities and agencies have been established and ministerial responsibilities have been redefined. Yet, it is nutrition, or rather 'mis-nutrition', that is the largest single cause of death and disease within the region, and indeed worldwide. This need not be the case. Nutrition and dietary policies may find themselves in close alliance with policies for sustainable agriculture. However, the change in thinking that will be required will mean reconsidering the role of commercial food production. Successful nutrition policies may yet prove to be the next major step in the improvement of public health.

Food policy: Agriculture: Diet: Sustainability

Few organisations monitor food policy. The Food Commission is a UK-based non-governmental organisation concerned with public health food policies; both the supply of food and its consumption. It looks beyond the 'stable to table' food chain described in literature from the European Commission and tries to link food production policies with nutrition and health policies.

There might be no need for such an organisation if food policies were working properly; but they are not. Agricultural policies have been highly successful in their own terms, producing abundant quantities of food, with rising yields and ever more sophisticated technologies. Food safety policies, although tarnished by several well-publicised episodes of food-borne disease, have nevertheless established extensive and largely successful inspection and control procedures. Nutrition policies, however, are still in their infancy.

An evaluation of national dietary surveys in Europe (Williams *et al*. 1999) found that few EU countries are able to meet the food-based dietary recommendations of the last two decades (World Health Organization Regional Office for Europe, 1988; World Health Organization, 1991), and no country is meeting all the recommendations (see Table 1).

Further recommendations could have been added, such as those relating to sugar, polyunsaturated fatty acids, breast-feeding, even body weight and physical activity, but it is unlikely that many more countries would be added to the list.

Even within a country's population there are few individuals who are meeting the targets; at least half should do so if the target for the population is to be met. For the UK, the data (Ministry of Agriculture, Fisheries and Food, 1994) are shown in Table 2.

This failure in food policy is extraordinary, given the importance of mis-nutrition in the creation of human ill health. While the media may be keen to report outbreaks of salmonella or a death from variant Creutzfeldt–Jakob disease, such incidents are relatively rare compared with the widespread epidemic of chronic non-communicable diseases such as diabetes, caries, cancers or cardiovascular disease. As a result the latter do not affect the political decision-making the way that food poisoning and bovine spongiform encephalopathy have done.

How do the data compare? In Denmark the government food agency has evaluated the relative impact on the population of different food-related diseases

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Table 1. EU countries achieving dietary goals when national dietary surveys were evaluated (data from Williams *et al*. 1999)

Population goal	Countries achieving goal, of fourteen EU countries examined
Dietary fat: <30% total energy	Portugal
Saturated fat: <10% total energy	Portugal
Fruit and vegetables: >400 g/d	Italy, Greece, Spain, possibly Portugal
Dietary fibre: 25–30 g/d	None

Table 2. Percentage of British adults achieving nutritional goals

Guideline	Men	Women
Fat intake	17·3	10·9
Saturated fat intake	3·3	2·3
Dietary fibre	25·4	5·6
All dietary guidelines	0·1	0·0

*Ministry of Agriculture, Fisheries and Food (1994).

Table 3. Annual incidence (per million population) of food and nutrition-related illness in Denmark (Foedevaredirektoratet, 2000)

Cases of *Escherichia coli* 0157:H7 food poisoning	≤4
Cases of campylobacter food poisoning	≤12 000
Cases of salmonella food poisoning	≤20 000
Cases of I deficiency	About 40 000
Obesity cases from excess energy intake and low physical activity	About 70 000
Cancer deaths from low fruit and vegetable intake	≤1000

(Foedevaredirektoratet, 2000) and an extract from their results is shown in Table 3.

A valuable new round of analyses is being conducted by the WHO, which looks at the overall burden of disease being suffered in a population. The WHO uses the concept of disability-adjusted life years (years of healthy life lost because of disease). Disability-adjusted life years take into account lost years of healthy life due to premature death and due to disease, including transient diseases such as food poisoning and chronic degenerative diseases such as cardiovascular disease, and also mental ill health.

Recent data for the European region (World Health Organization, 2000) show that $>130\times10^6$ disability-adjusted life years are lost annually to a wide range of diseases, and that nutritional factors have an important role to play in about 55×10^6 of these diseases, and have a modulating function in a further 50×10^6 (Fig. 1).

Estimates have been made of the relative importance (the 'attributable percentage') of food-related factors compared with other factors in the causation of this disease burden (National Institute of Public Health, 1997). The analysis found that excess energy intake, excess saturated fat, and insufficient fruit and vegetables accounted for approximately 9 % of the total burden of ill health, similar to tobacco smoking (see Table 4). The percentage is even higher if a lack of physical activity is included.

During 2002 the WHO is expected to publish a review of its data on disease burden and the attributable risks. Preliminary results indicate that undernutrition, lack of fruit and vegetables, physical activity and obesity will feature strongly in the results.

Obesity is itself a substantial problem. According to WHO (2001) data, there are now globally more obese adults (BMI >30 kg/m^2) than underweight adults (BMI <17 kg/m^2;

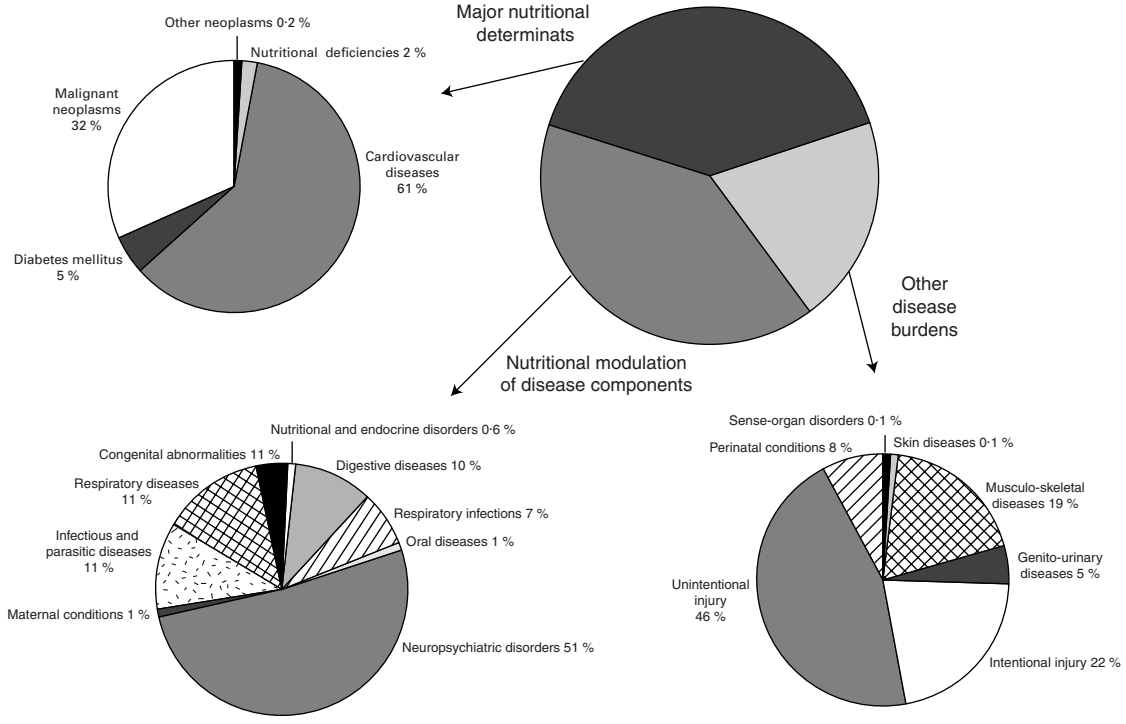

Fig. 1. Lost years of healthy life in the European region. (Data from World Health Organization, 2000.)

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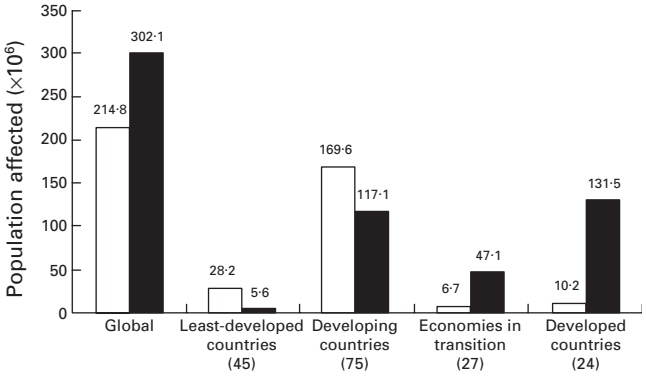

Fig. 2. Data showing that worldwide the number of obese adults (BMI ≥ 30 kg/m^2; ▬) is greater than the number of underweight adults (BMI < 17 kg/m^2; ▭). (World Health Organization, 2001.)

Table 4. Risks leading to disease burden in the EU (National Institute of Public Health, 1997)

Factor	Attributable percentage
Tobacco smoking	9·0
Alcohol consumption	8·4
Overweight	3·7
Occupational risks	3·6
Low vegetable and fruit diet	3·5
Drug addiction	2·4
Physical inactivity	1·4
High-saturated-fat diet	1·1

Table 5. Examples of divided policy responsibilities at local, national and international level

	Food production	Nutrition
Local	Food inspection, trading standards	Health promotion, community dietetics
National	Ministries of agriculture and/or environment	Departments of health, national food agencies
EU	Common Agricultural Policy (budget of $\in 40 \times 10^9$)	Health and consumer protection (budget under $< \in 1 \times 10^9$)
World	FAO	WHO

Fig. 2). The problem is greatest in industrialised countries, but it is also a rapidly rising and serious problem, indeed an epidemic, in many developing countries.

There is a long history of divided responsibility for food policy. Table 5 gives some examples of this division. In the UK food supply and food consumption policies have been divided across several agencies since the dismantling of the Ministry of Food after the Second World War. The UK's local services that deal with healthy diet promotion and health education come under a different authority from food inspection services, and different again from local veterinary and farm monitoring services.

At national level, separate ministries are responsible for agriculture and for health. Agriculture is viewed as a business, and ministry responsibilities include the support of agricultural trade in local and international markets. Food-safety policies bridge the gap between agriculture and health ministries, but nutrition policies do not.

At EU level, the European Commission is divided into those that handle agriculture, especially the Common Agriculture Policy, and those that handle health and consumer affairs. Although major food-safety problems have arisen in the last decade, e.g. dioxin contamination and bovine spongiform encaphalopathy, health and consumer concerns are not on the agenda for the renegotiation of the Common Agricultural Policy in the current mid-term review. The first Status Report on the European Commission's activity in the field of nutrition is expected to be published during 2002, but it will not show that substantial progress has been made in ensuring that nutrition is a priority within the Common Agriculture Policy.

At global level, the policies are divided between two UN bodies. Agriculture and food production is the domain of the FAO, while health and the effects of food consumption come under the WHO.

The effect of these divided responsibilities is a lack of coherence or consistency in food and health policies. While a health authority makes a dietary recommendation, a food or agriculture department may be inadvertently undermining that recommendation. Some examples of these contradictions are shown in Table 6.

Integrated policies are possible and can prove effective. Europe has a remarkable history of public health endeavour, such as the provision of clean water, the construction of sewerage systems, the creation of the public analyst and the health inspector and the health visitor. In the UK integrated programmes for preventing ill health led the Ministry of

Table 6. Examples of discordance in health and food supply policies

Health policy	Food supply policy
Dietary guidelines to reduce intake of dairy fats	Agriculture policy support for production and promotion of dairy fats, butter distribution subsidies, butter and oil advertising support
Dietary guidelines to limit sugar consumption	Agriculture policy support for production of sugar, over-production 'institutionalised'
Policies to encourage greater consumption of fruit and vegetables	Market protection measures encourage destruction of produce and of orchards, intensive production leads to potential pesticide contamination
Recommendations to eat more fish, especially oily fish	Incentives to over-fish lead to stock collapse and emergency quotas. Intensive fish farming leads to contamination concerns
Food safety concerns with beef, eggs, chicken	Subsidies for animal feed production encourage higher animal production levels, antibiotic use encourages resistant strains of bacteria, cheap imports threaten local production and increase inspection problems

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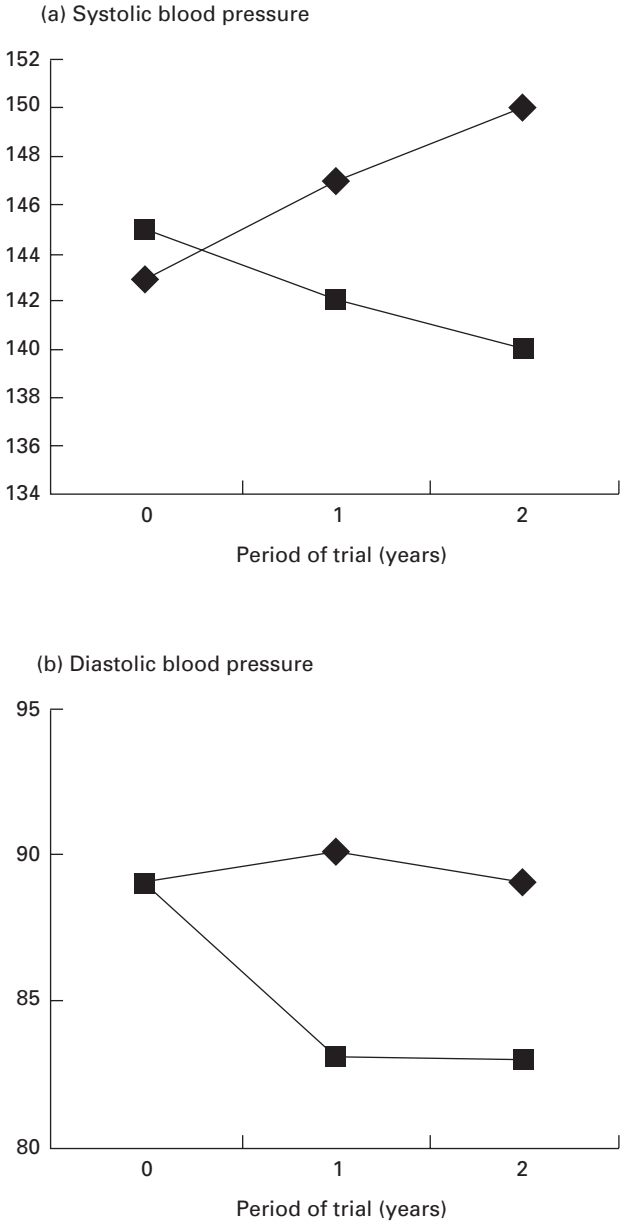

Fig. 3. Changes in systolic (a) and diastolic (b) blood pressure of residents of two rural Portuguese villages over the 1-year intervention period and after a 1-year follow-up period. (■), Village in which salt was reduced in cooking and in the local bakeries' bread by 50 %; (◆), control village. (Data from Forte *et al.* 1989.)

Food's initiatives during the Second World War, linking agricultural output and food production policies to nutritional policies.

Even relatively small alterations in local food production practices can have a marked effect. Portugal, which has one of the highest rates of elevated blood pressure in Europe, was the subject of an intervention project aimed at finding ways of dealing with this issue (Forte *et al.* 1989). The study, conducted in two rural villages, found that a reduction of salt in cooking and in the local bakeries' bread, by about 50 %, led to a marked fall in blood pressure. This outcome was sustained over the 1-year trial, and during a 1-year follow-up period (Fig. 3).

The North Karelia trials in Finland, which were so successful that they became national projects in the 1970s and 1980s, are an example of a large-scale integrated intervention involving changes in food supplies and manufacturing processes as well as public health education (Puska, 2000). A reduction in animal fats, partially replaced with vegetable fats, and a rise in fruit consumption led to a dramatic fall in the physiological indicators of heart disease, and an even greater than expected fall in cardiovascular mortality rates (Vartiainen *et al.* 1994) (Fig. 4).

Where such deliberate interventions are not being made, food consumption patterns fail to show concordance with dietary recommendations. Using data from the Food and Agricultural Organization (2002*a*), it can be shown that food supply trends under current policies appear to be failing to meet commonly-accepted nutrition targets. Table 7 shows estimates of the food supplies that would meet nutritional recommendations and the current food

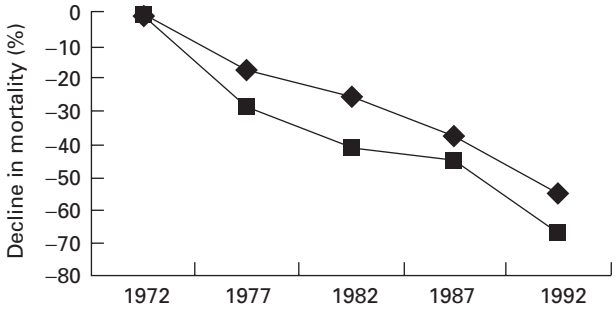

Fig. 4. Decline in cardiovascular morbidity in Finnish men (◆) and women (■) aged 35–64 years following interventions involving changes in food supplies and food production formulations. (Data from Vartiainen *et al.*1994.)

Table 7. Comparisons between agricultural supplies and dietary recommendations for Italy and the Republic of Ireland in 1965 and 1999*

		Agriculture supplies to domestic population (g/person per d)			
		Italy		Ireland	
Dietary recommendation	Food supply implication (person/d)	1965	1999	1965	1999
Fat < 30 % energy	Supply < 80 g fat	90	152	119	136
Saturated fatty acids <10 % energy	Supply < 60 g fat from animal products	38	70	100	89
Free sugars <10 % energy	Supply < 70 g raw sugar equivalent	73	81	146	116
Fruit and vegetables >400 g/d	Supply at least 600 g fruit and vegetables	720	858	245	390

*Data from World Health Organization Regional Office for Europe (1988) and World Health Organization (1991).

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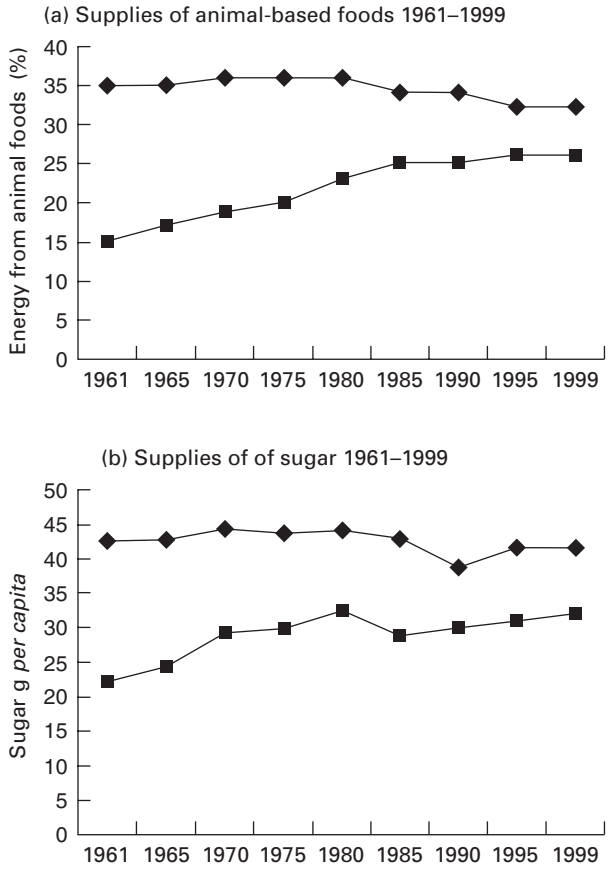

Fig. 5. Food supply patterns, showing that those of southern Europe (population-weighted average of Greece, Italy, Spain and Portugal; ◆) are converging with those of northern Europe (population-weighted average of Germany, Denmark, Republic of Ireland and UK; ■). (From Food and Agriculture Organization, 2002*a*.)

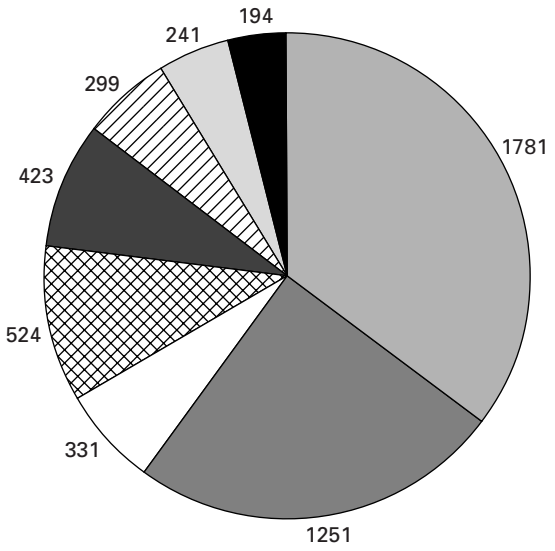

Fig. 6. Foreign direct investment in the agro-food sector ($\times 10^6$ US $) 1990–7 in eleven transition countries (Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Lithuania, Poland, Romania, Russia and Ukraine). (▩), Sugar and confectionery; (▤), soft drinks; (▭), milling and baking; (▬), milk and dairy; (▤), other processed foods; (▨), fruit and vegetables; (▤), vegetable oils and fats; (▬), meat and ready meals.

supplies for two countries, Italy and the Republic of Ireland. The supplies in 1965 and 1999 show a rising trend in sugar and fat supplies well above those that might reasonably be recommended.

The evidence suggests that where food and nutrition policies are not being actively promoted dietary patterns may deteriorate. Italy and its neighbours are the home of the traditional 'Mediterranean diet' but, as Fig. 5 indicates, the patterns of food supply in southern Europe have changed since the 1960s, and are now increasingly similar to those found in northern Europe (Food and Agriculture Organization, 2002*a*).

In other parts of Europe the trends are also of concern. In Eastern Europe much of the transition in food supplies is coming as a result of outside investment. In this region consumption of animal products has been high for several decades, while obesity incidence and cardiovascular and cancer mortality rates are markedly higher than those in the EU. Dietary recommendations would include a marked rise in fruit and vegetable consumption, as well as a reduction in fatty foods. However, an analysis by the Organization for Economic Co-operation and Development (1998) shows that for every 100 US $ being invested in fruit and vegetable production, >1000 US $ is being invested in soft drinks and confectionery production (Fig. 6).

The evidence shows that, without positive intervention, a modernisation of food supplies is linked to a deterioration of diet. This trend, known as the 'nutrition transition', is being increasingly recognised among health and, importantly, agriculture policy-making bodies. Statements from the Food and Agriculture Organization (2002*b,c*) show a welcome appreciation of the problem:

'The thinking used to be that if people get enough energy in their diets, the micronutrients will take care of themselves. But increasingly people are eating larger quantities of cheap food that fill the stomach but still leave the body without those micronutrients.' (Food and Agriculture Organization, 2002*b*); 'Farmers have given up subsistence farming of multiple crops that provide a more balanced diet in favour of a single high-yielding cash crop. Another element … is the increasing importation of foods from the industrialised world. As a result, traditional diets featuring grains and vegetables are giving way to meals high in fat and sugar.' (Food and Agriculture Organization, 2002*c*).

Food and nutrition policies may be undermined by commercial activities agricultural policies and they may soon be overtaken by changes in other aspects of agricultural and environmental policies. After a century of research into maximising yields, developing intensive-farming techniques and boosting the quantity of production, agricultural practices are being reassessed in terms of the damage they do to their surroundings and the demands that they make on resources. This reassessment may have a profound influence on nutrition.

With increasing demands being placed on the food supply by an increasing, and increasingly wealthy, world population, new interest is being expressed in food security and crop productivity. Typical yields of food from 1 ha,

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Table 8. Productivity of land: plant *v.* animal foods (from Spedding, 1990)

Food	Energy output (MJ/ha)	No. of people fed (/year per ha)
Cabbage	105 000	23
Potatoes	102 080	22
Rice	87 768	19
Wheat	69 534	15
Beans	43 466	9
Peas	40 805	9
Pork	14 438	3
Lamb	7 486	2
Chicken	7 056	2
Beef	4 796	1

converted to energy for consumption, have been calculated by Spedding (1990). Table 8 shows the superior efficiency of plant-based diets compared with meat-based diets.

A similar table can be shown for the water requirements of crops. Water is becoming a scarcer commodity. Water for agriculture is one of the main uses of water in human populations, and data from Pimentel *et al*. (1997) demonstrate how demanding certain types of food are on this resource (l/kg food): potatoes 500, wheat 900, sorghum 1100, maize 1400, rice 1910, soya beans 3500, beef 100 000.

Estimates have been made of the total ecological costs of producing food, including the energy resources required for the production inputs, i.e. the chemicals, transportation and processing of different types of food. The ecological burden is expressed in terms of the land area needed to provide the resources and cope with the pollution, the 'footprint' of land needed to account for all the resources required. Estimates (ECOTEC, 2001) of the land needed to produce 1 tonne of each type of food are (ha): vegetables 0·7, fruit 0·8, milk 1·5, cereal foods 2·1, pulses 4·0, meat 10·5.

Using these values in combination with the current food supply to the UK population (Food and Agriculture Organization, 2002*a*) indicates that the UK's present dietary patterns require a land area more than five times the nation's current agricultural area ($\times 10^6$ ha): vegetables 8·3, fruit 4·1, milk 20·9, cereal foods, 13·4, pulses 1·6, meat 53·6, total 101·9. UK agricultural area is 19×10^6 ha.

The UK depends on large areas of land in other parts of the world, and large quantities of non-renewable resources. This situation is a classic example of unsustainable production; it only continues while other populations make fewer demands on world resources and while those resources remain available. A global population of 9–10 billion living UK-type lifestyles will need two or three planets the size of the Earth to sustain itself (Rees, 1999).

An alternative will have to be found and, as the data suggest, this alternative will need to be based on the human population accepting a largely plant-based diet. The implications for ecological sustainability and for dietary health have been compared by the Swedish Environmental Protection Agency (2001) and are shown in Table 9.

In conclusion, current food policies are largely incompatible with good public health, but interventions that include food producers and processors can markedly improve a population's dietary health. Such an undertaking will require cooperation with farming and commercial food producers in order to counter the current trends in food supplies and to re-shape the nutrition transition.

Table 9. Comparisons of the recommendations for reducing ecological impact and improving dietary patterns (Swedish Environmental Protection Agency, 2001)

	Recommended for reduced ecological impact	Recommended by WHO dietary guidelines*
Bread	Increase	Increase
Cereal	Increase	Increase
Potato	Increase	Increase
Vegetables	Increase	Increase
Root vegetables	Increase	Increase
Dried legumes	Increase	Increase
Fish	—	Increase
Snacks and sweets	Reduce	Reduce
Soft drinks	Reduce	Reduce
Margarine, butter, oil	—	Reduce
Milk products	Reduce	(Reduce)
Cheese	Reduce	(Reduce)
Egg	Reduce	(Reduce)
Meat, poultry, sausage	Reduce	(Reduce)

*World Health Organization Regional Office for Europe (2000) and A Robertson (unpublished results).

There are already pressures to change agricultural production to improve sustainability of food supplies, which could provide an additional opportunity for nutritionists to help in shaping the diet of the future. Nutrition has an important role to play in improving public health, and nutritionists must take responsibility for ensuring that it does.

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J. H. James illustrated the data for Fig. 1.

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