



Food and nutrition policy for schools

**A tool for the development of school nutrition
programmes in the European Region**

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ABSTRACT

Healthy nutrition interventions need to occur early in childhood and adolescence in order to prevent or reverse the adverse health effects of overweight and poor eating habits. Childhood and adolescence is a critical period for diets of high nutritional quality as the physiological need for nutrients is high relative to energy needs. In addition, many core eating habits and behavioural patterns are developed that may persist throughout adulthood. Schools can provide an important opportunity for prevention, because they provide the most effective method of reaching large numbers of people, including youth, school staff, families and community members. Healthy food and improved nutrition should be a high priority on every school agenda because of the positive affect on child well-being, and subsequent enhanced learning ability and academic performance. A single European school food and nutrition policy cannot be formulated due to wide cross-country variation among schooling systems. It is therefore essential for each country, authority or school to decide which of the suggestions for school nutrition and food policy are most appropriate and applicable to their circumstances. Dietary guidelines are provided in Annex 1 for children in nursery school and preschool (3–7 years old) and students in primary and secondary schools (7–18 years old).

Keywords

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Acronyms

BBB	Boost Better Breaks initiative
BMI	Body Mass Index
CAP	Common Agricultural Policy
CINDI	Countrywide Integrated Noncommunicable Disease Intervention
EPHA	European Public Health Alliance
EPPI	Evidence for Policy and Practice Information and Coordinating Centre
ERIC	Enuresis Resource and Information Centre
EU	European Union
FAO	Food and Agriculture Organisation
FSA	Food Standards Agency
HBSC	Health behaviour in school-aged children study
HDRA	Henry Doubleday Research Association
IOTF	International Obesity Task Force
KOPS	Kiel Obesity Prevention Study
LDL	Low-density lipoprotein
NCD	Noncommunicable diseases
NDNS	National Diet and Nutrition Survey
NHMRC	National Health and Medical Research Council
SACN	Scientific Advisory Committee on Nutrition
UK	United Kingdom
UNICEF	United Nations Children's Fund
USDA	United States Department of Agriculture
USI	Universal Salt Iodisation
WHO	World Health Organization

Glossary of terms

Body Mass Index (BMI): a tool used for indicating weight status. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m^2). BMI ranges reflect the effect of body weight on health and disease. The risk of some diseases increases as BMI increases. Condition particularly related to overweight and obesity include; cardiovascular disease, high blood pressure, cancer and diabetes.

Dietary Reference Values (DRV): estimates of nutrient requirements based on the needs within a population and/or group. DRV's are population estimates and not goals for individuals.

Estimated Average Requirement (EAR): average daily nutrient intake level that meets the needs of 50% of the "healthy" individuals in a particular age and gender group.. For populations receiving adequate amounts, the range of intakes will vary around the EAR – approximately 50% of the population will require less and approximately 50% will require more.

Reference Nutrient Intake (RNI): the amount of nutrient required to prevent deficiencies in 97.5% of the population. RNI's are used for protein, vitamins, and minerals. They are not minimum targets, but estimates of the amount required by the majority of the population.

School governors: a committee of elected members that are responsible for the strategic direction and overall management of the school and support the head-teacher in the development of school policies and their subsequent implementation. The roles and responsibilities of a governing body and its constituent governors are broad and considerable and may include areas such as finance, curriculum, premises, special needs, literacy, numeracy, personnel, and admissions. The governing body may be responsible for the management of the school budget, employment (typically acting as the recruitment team for all staff positions including the headship), salaries, running costs, maintenance and equipment. They prioritize actions and monitor progress. Governors are not responsible for day-to-day implementation of decisions or involvement with the day to day management of the school unless they are members of the governing body through their profession as a head teacher or staff representative.

Executive Summary

Interventions targeted at healthy nutrition need to occur early in childhood and adolescence in order to prevent or reverse the adverse health effects of overweight and poor eating habits (St-Onge, Keller & Heymsfield, 2003). Childhood and adolescence is a critical period as the physiological need for nutrients is high relative to energy needs. A diet of high nutritional quality is therefore particularly important. In addition, eating habits, lifestyle and behaviour patterns are developed that may persist throughout adulthood.

Schools can provide an important opportunity for prevention (Carter, 2002), as they provide the most effective way of reaching large numbers of people, including youth, school staff, families and community members (WHO, 1998). Healthy food and nutrition should be a high priority on every school agenda because of the positive affect on child well-being. Evidence suggests healthy food and improved nutrition improves learning ability, leading to better academic performance.

A universal food and nutrition policy cannot be formulated due to the wide variation in European school systems. Individual countries, authorities or schools are therefore responsible for deciding which suggestions are most appropriate and applicable to their circumstances. However, four key elements can be identified: the school community, the school curriculum, school environment and school nutrition and health services.

In order to design and implement a school food and nutrition policy it is important to unite all the different stakeholders. Efforts will be more effective when undertaken by a core action group representative of the broader school community (Kubik et al., 2003). The group should consist of representatives of teachers, parents, pupils, caterers, local retailers as well as health professionals and representatives from the school's governing body. Following a baseline assessment of the current food and nutrition situation, the core action group should develop a food and nutrition policy and action plan specific to the school. The action plan needs to identify specific goals and a strategy for achieving them. The recommendations outlined in section 4, for children of preschool and school age could prove useful tools. The overall policy document should aim to ensure that all direct and indirect nutritional messages in the school are coherent and consistent, including those directed at the curriculum, the school environment, the parents and the local community.

The curriculum needs to cover several broad categories of nutrition, food and eating (Dixey et al., 1999) and pupils need to acquire life skills specific to healthy nutrition (WHO, 2003b). The school environment can be improved by providing healthy meals, breakfast clubs, subscription schemes for fruit, vegetables and milk, healthy options in vending machines and snack bars and water. The establishment of a school health service can also contribute to a healthy environment. To improve children's nutritional behaviour patterns and knowledge, the community must also be involved in health promotion. The best way to achieve community participation is to collaborate with different sectors and stakeholders. Parents and care givers are important stakeholders and need to be involved if school-based initiatives are to be sustainable and have a lasting effect on pupils' health. Other community stakeholders of importance include local farmers, retailers and media.

After implementation, the impact of an action plan should be monitored, evaluated and adjusted at regular intervals to ensure the benefits of a healthy school environment are maximised.

Five steps to designing and implementing a food and nutrition policy for schools	
1	Assemble a core action group
2	Carry out a baseline assessment of nutrition in your school
3	Develop a food and nutrition policy based on: WHO European recommendations for healthy eating and active lifestyle for children and adolescents Four key elements: the school community, school curriculum, school environment and school nutrition and health services.
4	Develop an action plan in the core action group.
5	Implement, monitor and evaluate the action plan.

Foreword

The improvement of children's lifestyle relies on actions carried out in school settings. This is widely acknowledged and has generated several successful initiatives throughout the WHO European Region. However, further commitment is needed by central and local governments to ensure an adequate school environment for all children in the European Region. This document was developed from an analysis of best practice and enriched by several contributions from nutrition scientists and education specialists to provide recommendations on how schools can best promote health through offering education and practice of good nutrition.

The document has been prepared with contributions from Vivian Barnekow, Francesco Branca, Emma Collins, Toki Izaki, Elizabeth Micko, Aileen Robertson and Nienke Veerbeek. Comments and suggestions were received from nutrition counterparts from Germany, Greece, Kazakstan, Norway, Romania, Serbia, Slovenia, Switzerland and Uzbekistan which are gratefully acknowledged. Editorial work was performed by Thomas Petruso.

1. Health and nutrition of school children

Childhood and adolescence are critical periods for health and development as the physiological need for nutrients increases and the consumption of a diet of high nutritional quality is particularly important. Eating habits, lifestyle and behaviour patterns are established during this period that may persist throughout adulthood.

Patterns of eating have a significant influence on health and well-being. A healthy diet during childhood and adolescence reduces the risk of immediate nutrition related health problems of primary concern to school children, namely obesity, dental caries and lack of physical activity. In addition, young people who healthy eating habits developed early in life are more likely to maintain them and thus be at reduced risk of chronic ailments such as cardiovascular diseases, cancer, type II diabetes and osteoporosis in adulthood.

1.1 Obesity

Overweight and obesity have increased drastically among children and adolescents and are considered major public health concerns. Obesity has been described by the WHO as “a global epidemic” due to its high and increasing prevalence. In Europe, according to the International Obesity Task Force (IOTF), the prevalence of overweight and obese children rose from 9% in 1980 to 24% in 2002, five points higher than expected based on trends from the 1980s. At present, it is estimated that 14 million school children in Europe are overweight, 3 million of who are obese (IOTF, 2004).

Obesity has long term negative consequences on the health of children and adolescents (WHO, 2004a). Childhood obesity increases the risk of type II diabetes, hypertension, cardiovascular diseases, certain cancers, arthritis and other disorders in adult life. Although considered adult diseases, type II diabetes has recently been found in children, highlighting warranted concern over the need for preventative action. The most important long-term consequence of childhood obesity is its persistence into adulthood. It is estimated that 50–80% of obese teenagers will remain obese adulthood (Guo et al., 2002; Lissau et al., 2004). Overweight and obesity in young people have been shown to be significantly associated with long-term morbidity and mortality, especially in the development of chronic illnesses, i.e. cardiovascular disease, cancer and type II diabetes.

1.2 Dental caries

Dental caries are highly prevalent in school children. The most important dietary cause is sugar, particularly sucrose – found in confectionary, soft drinks, biscuits, cake, fruit juices, honey and added sugar. The frequency of consumption as well as the total amount of the sugars consumed is important in the aetiology of caries (Sheiham, 2001). Furthermore, the rates of dental erosion, related to extrinsic and intrinsic acids, appear to be rising. This increase is mainly thought to be due to an increased consumption of acidic soft drinks (Moynihan & Petersen, 2004).

Oral health is closely linked to diet and nutrition as poor dietary practices increase the risk of oral disease. Schools, by taking part in healthy nutrition initiatives which enforce healthy snacks or “no sugar” policies, can thereby at the same time promote children’s oral health (WHO, 2003a).

1.3 Lack of physical activity

The WHO Global Strategy on Diet, Physical Activity and Health recognises physical activity as one of the main risk factors for noncommunicable diseases and consequently the burden of overweight and obesity. Particular attention is given to concerns regarding the unhealthy diet, lack of physical activity and energy imbalances in children and adolescents (WHO, 2004b).

Physical activity is believed to be an important factor determining the weight of children. Activity levels among children and adolescents are low. Sedentary behaviours, i.e. playing electronic games, are the general norm and are believed to be directly associated with obesity (Stettler et al., 2004).

In addition, inactive children and adolescents who consume small amounts of food may compromise the range of nutrients they consume and fail to meet requirements. To maintain a healthy weight, children and adolescents need to balance energy intake and expenditure.

1.4 Eating habits

The fundamental issues behind public health concerns for young people are the changes in food habits that have developed as a result of the globalisation of food. Over the past few decades significant changes have taken place in eating habits and home environments.

The increase in families with two working parents and time limitations has led to the 'convenience revolution' with pre-packed processed products forming the basis of the majority of meals prepared in the home. The tendency to 'eat out' has also risen (St-Onge, Keller & Heymsfield, 2003). This was demonstrated in Finland where approximately one third of the population consume one meal per day outside of the home (Finnish National Nutrition Surveillance System, 1999). The opportunity for children to learn and develop basic food skills at home are declining at the same time as cooking skills are being removed from school curriculum due to increasing time and cost factors. Many children and adolescents grow up without learning the basic skills of how to provide for a healthy diet. Eating out may be the only option for feeding themselves with which they are familiar, encouraging the consumption of large portions of meals and snacks with unknown calorific and nutrient content (James, 2002).

Snacking is often associated with skipping breakfast. Research has shown that skipping breakfast increases impulsive snacking on foods high in sugar and fat (Schlundt et al., 1992), so the fact that on average only 69% of boys and 60% of girls have breakfast every morning on school days might contribute to the extensive consumption of high sugar foods (WHO, 2004a). In addition, skipping breakfast leads to mid-morning fatigue and may interfere with learning (WHO, 2004a).

The consumption of snack products high in energy, fat, sugar and salt may be responsible for the decline in fruit and vegetable consumption evidenced in recent research. Results from the WHO international study *Health behaviour in school-aged children* (HBSC) (2004) show that on average fruit and vegetable consumption in children and adolescents is very low: only 30% of boys and 37% of girls reported eating fruit daily and less than 50% of all young people report eating vegetables daily (28% of boys and 34% of girls). In 16 countries and regions, over 25% of young people only consume fruit once a week or less. Moreover, the proportion of pupils eating fruit and vegetables on a regular basis decreases further with age.

In Israel, the Netherlands, Malta, Scotland and Slovenia, more than 40% of school-aged children consume soft drinks daily. Daily consumption is lowest in Scandinavia, the Baltic countries, Greece and Ukraine, but is still as high as 10–20%. Furthermore, almost one third of pupils eat sweets or chocolates once or more than once a day, with the highest percentages in Ireland, Malta and Scotland (WHO, 2004a).

Social factors influence dietary intake, especially during adolescence. Eating habits, food choice and meal patterns of young people reflect the weakening influence of the family and increasing peer pressure. Changes in eating habits can be associated with the need to express freedom from parental control and the forging of identity. Independence can be expressed through increased consumption of meals – often take-away fast foods – outside the home or school setting. The various psychological, social and environmental factors that influence food preferences increases with age as children and adolescents are subject to an increasing array of developmental changes and influences outside the home (NHMRC, 2003). Children and adolescents experience peer pressure in many areas, including eating, and group behaviour becomes a norm (NHMRC, 2003). Important influences on children’s attitudes and food choices include taste, parental attitudes (Brown & Ogden, 2004; Cullen et al, 2001), schooling and the media marketing. Moreover, eating habits are strongly affected by cultural pressures. Many adolescents and children feel pressured into having an “ideal” body shape. The desire to be thin and the stigma of obesity may have a significant effect on body image and self-esteem in young people (WHO, 2004a).

Research over the past 30 years has shown the cultural influences of slimness and dieting have become more influential in adolescent populations. Dieting and other weight control methods have become well-known features of adolescent behaviour. Adolescents often find it difficult to classify themselves appropriately in terms of weight; the perception of overweight, rather than actual weight, appears to be a potent force behind weight concerns and dieting. Major gender differences are apparent in how female and male adolescents evaluate their bodies. For many girls, the goal may not be normal weight, but underweight; whereas boys more likely to perceive themselves as underweight engage in weight-gaining (muscle-enhancing) activities. The HBSC report shows clear gender differences in young people with 36% of girls and 22% of boys reporting dissatisfaction with body weight. Girls’ dissatisfaction increases with age from 28% in 11-year-olds to 42% in 15-year-olds, whereas the boys’ remains static at 20% to 24% respectively.

Public concern has arisen surrounding the use of dieting and weight control methods among young people, due to the associated negative physical and psychological outcomes. Dieters are more prone to irritability, concentration problems, sleep disturbances, menstrual irregularities, growth retardation, delayed sexual maturation and nutritional deficiencies. Dieting can notably affect psychological well-being; it is strongly associated with depression and reduced self-esteem. Furthermore, dieting has been identified as a powerful predictor of new eating disorders and can lead to anorexia nervosa or bulimia nervosa (Patton et al., 1999). Martinez-Gonzalez et al. (2003) found a strong link between eating alone and the onset of an eating disorder.

1.5 Good nutrition in school

Healthy nutrition improves child well-being and learning ability, leading to better academic performance. Evidence shows positive links between children who are well nourished and improved learning, attendance, behaviour and consequently child-teacher relationships (The

Food Commission, 2001). Good nutrition also fosters mental, social and physical well-being, contributing to increased self esteem and positive body image.

However, despite the evidence, the recognition of the benefits of good nutrition have been largely lost as a result of globalisation and the development of international food markets. The nutritional status of children's diets across the world has suffered as a result of trade actions that have increased reliance on food imports (Brownell and Yach, 2006). With the focus on cheap food of poor nutritional quality, food marketing, and the ongoing technological advances that reduce the need for physical labour, the rise of chronic disease to epidemic proportions is an inevitable consequence. The indicative impact of the environment as being both a fundamental contributor and preventative factor (Brownell and Yach, 2006) in improving the welfare and health of the population is clear.

Schools and educational institutions provide a key environmental setting in which to facilitate actions that promote healthy choices as the norm. Focusing on establishing a whole school approach to health, and through targeting the wider community, a concrete food and nutrition policy in schools can not only bring short-term improvements in the daily lives of young people, but also establish healthy attitudes – preventing the onset of obesity and chronic disease in later life. A whole-school approach to healthy eating can provide children and adolescents with both the opportunity to learn food and nutrition skills and how best to implement them both within and outside the school setting. Schools must not only teach children about healthy lifestyles but also how to implement the recommendations (Snyder et al., 1999). Pupils learn how to choose a healthy diet through the meals and snacks provided at school and develop a range of consumer based skills including food growing, handling, preparation and cooking. It is important to ensure that food and nutrition messages are consistent and not contradictory. In addition, in order to support pupils, teachers must be given the opportunity to improve their knowledge and skills in food education.

Interventions targeted at healthy nutrition need to occur early in childhood and adolescence in order to prevent or reverse the adverse health effects of overweight and poor eating habits (St-Onge, Keller & Heymsfield, 2003). As the prevalence of child obesity continues to increase rapidly worldwide it has been suggested that aggressive approaches to prevention and treatment are required to limit the substantial and long lasting health and social consequences of obesity. Schools can play an important role in the prevention of obesity. Reaching children and adolescents at an age when health behaviours are shaped, and the onset of disease prevented, may be most effective method of intervention. Initiatives targeting obesity in schools could be incorporated into existing health promotion programmes or combined with other interventions encouraging healthy eating; the messages and strategies will complement and reinforce each other. In order to focus on healthy eating rather than on slimming or dieting, school-based interventions should emphasise healthy nutrition in obese as well normal-weight children (Lissau et al., 2002).

Although, the problems identified above will not be overcome by the efforts of the educational system alone, schools provide an important opportunity for prevention (Carter, 2002) as they offer the most effective way of communicating key health messages to large population groups, including youth, school staff, families and community members (WHO, 1998). Healthy nutrition during childhood and adolescence lays a foundation for healthy adulthood. Therefore the multiple benefits of healthy food and nutrition in childhood and adolescence reinforces the need for these issues to be a high priority on school agendas.

A universal food and nutrition policy cannot be formulated due to the wide variation between European schooling systems that exists. It is therefore the responsibility of individual countries, schools or authorities to decide which of the proposed suggestions presented in this guide are most appropriate and applicable to context specific circumstances.

2. Designing a food and nutrition policy for schools

Schools and educational institutions have been identified as one of the fundamental settings for health promotion and establishing healthy eating and lifestyle patterns (Scriven and Stiddard, 2003). However, tackling nutrition issues in childhood requires coherent action in the school setting, as the hierarchical culture may inhibit achievement and empowerment. Improved school health is achieved by the development of food and nutrition policy. A written policy document should be produced based on a situational analysis specific to the context and agreed upon by all the different stakeholders involved.

2.1 Approaches to school food and nutrition policy

The World Health Organisation's Global School Health Initiative was launched in 1995, with the mandate to use schools as a means of strengthening health promotion and education activities at local, national, regional and global levels – thereby improving the health of students, families and all members of the community (WHO, 2006). The term 'health promoting schools' was developed to recognise educational institutions that "constantly strengthens its capacity as a healthy setting for living, learning and working" (WHO, 2006).

The concept of a health promoting school is based on a social model of health, emphasizing the needs of the individual at the centre of the entire organisation. Using a holistic approach, a supportive setting is created influencing the perceptions and actions of all involved with the school, from parents to caterers and food providers (ENHPS, 2006). This is particularly important when addressing child nutrition and health, as all stakeholders involved in the provision of school food influence the overall nutritional quality and therefore diets of young consumers.

The European Network of Health Promoting Schools (ENHPS) operates within the European region to integrate health promoting school policy into wider health and educational sectors. Working at school, national and international level, it recognises that schools are ideally placed to promote child health, and that of the wider community through the curriculum, school environment, community and nutrition and health service (ENPHS, 2006).

The concept of health promoting schools initiated the development of various approaches to the formation of school health policy. Evidence of various approaches exists throughout the European region, demonstrating the variety of techniques that can be employed depending on the objectives particular to a given country. Approaches range from being top down, led by the national Governments, to local community based projects formulated by organisations and/or resulting from academic projects. Examples of a range of projects with alternative approaches are given below.

Top down approaches led by national governments, as seen in Belgium, may focus on broad-based analysis and evaluation of policy and focus on the need for nationwide partnerships. The

Flemish Institute for Health Promotion in Brussels has encouraged schools throughout Brussels to analyse current nutrition policy and adopt action plans for improvements. The Tutti Frutti campaign¹ has assisted in helping schools to implement nutrition policy through providing schools with fruit.

In contrast, local organisations and/or academic projects highlight the importance of cross sector collaboration. The TigerKids² programme operating in Germany brings together qualified partners from the educational, medical and public health sector. The programme focussed on the prevention of obesity in children attending kindergarten. Promotional materials are produced and given to children to support the messages promoted in class through regular daily activity (of 1 hour per day) and fruit and vegetable consumption. Danish programmes aiming to bridge the gap between health prevention and promotion have indicated the value of peer led education and learning when dealing with health based issues. The Danish University of Education has initiated a number of projects, including a European initiative³ that focus on determinants of health at population level rather than only individual behaviour. They are however, child focussed and consist of a dialogue approach whereby peers network together to establish priorities and points for action, thus introducing a sustainable dimension. Children collaborate with the school and local community thereby identifying needs that are culturally sensitive and context specific. Through active participation, the children not only develop a greater capacity for understanding the values and issues underlying health but develop a sense of ownership. Results have proven student led health practices to be far more effective than those stimulated by teachers⁴.

The aim of this section therefore is to provide further insight into the steps required in the development and implementation of a school food and nutrition policy regardless of the level of implementation. It acts as a practical tool highlighting the fundamental roles of *all* those involved in the provision of food to school children, emphasising the importance of community and cross sector collaboration. Recognising the diversity of situational factors that influence the design and implementation of school policy, it reinforces the need to incorporate the views of all relevant stakeholders in an effort to ensure the final policy is realistically designed and sustainable.

2.2 Assembling a core action group

In order to design and implement a food and nutrition school policy it is important to unite all relevant stakeholders. Efforts will be more effective when they are undertaken by an action group representative of the broader school community (Kubik et al., 2003). Core action groups should consist of representatives of the school governors, teachers, parents, pupils, caterers, local retailers and health professionals. Pupils also need to be equally involved as stakeholders in the development of policy and health based interventions. Children and young people should always be consulted on matters concerning the promotion of healthy eating as they are likely to better understand the factors acting as facilitators or barriers to success (EPPI, 2003). Fig. 1 gives illustrative representation of the elements to be considered when developing a food and nutrition policy for a school.

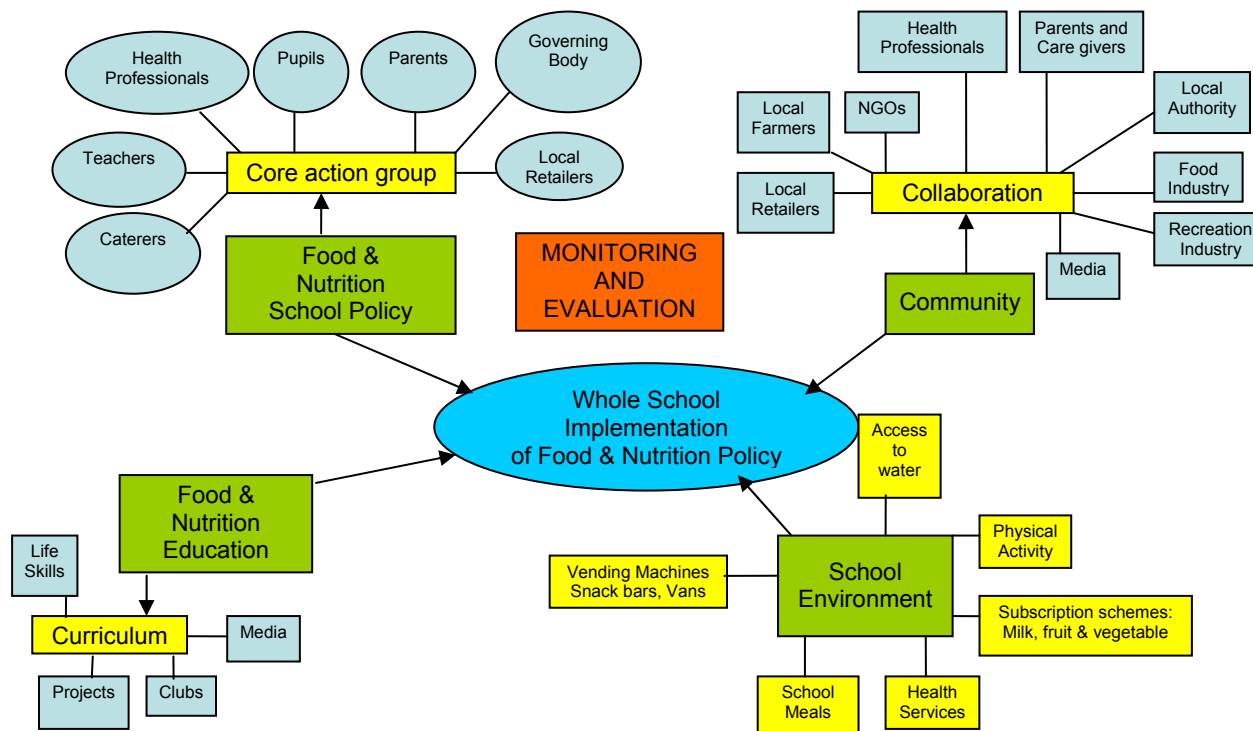
¹ <http://www.euro.who.int/Document/ENHPS/ENHPSnews092005.pdf>

² www.tigerkids.net

³ www.paueducation.com/shapeup/oms_shape_up/

⁴ www.dpu.dk

Fig. 1. Whole school implementation of a food and nutrition policy



Source: Sustain, 2005

2.3 Carrying out a baseline assessment of nutrition in the school

An initial baseline assessment of the current food and nutrition situation in each school is the primary activity once the core action group has been successfully formulated. This is required to address current policy issues within the school. For example:

- what is the current school policy towards meals and snacks?
- where is information concerning food and nutrition incorporated in the curriculum?
- how are food and nutrition aspects integrated into the whole school environment and wider community?

Eating patterns and attitudes toward food provided in schools should be closely examined; pupils, teachers and parents should be consulted and their opinions of the current situation and the alterations they feel are necessary incorporated into the assessment. This method of assessment ensures all stakeholders are involved and promotes the project both inside and outside the school setting.

2.4 Developing a food and nutrition policy

Following the initial assessment, the core action group should develop a specific food and nutrition policy based on the baseline results. The policy should focus on four key elements: school curriculum, school environment, school nutrition and health services, and the school community. However, the wide range of influences on school development will dictate the needs and challenges identified (Denman, 1999). Prioritised actions will therefore vary dependent on context and locality. This reinforces the need to consider the interests and concerns of all stakeholders in the formulation of a food and nutrition policy thus maximising policy

development and implementation. Each school should therefore consider how best to implement the recommendations, illustrated in section 4 (WHO, 2006a).

The underlying aim of a school food and nutrition policy is to ensure that messages promoted throughout the school system are consistent and mutually reinforcing. Schools need to teach healthy living and assist pupils in implementing their knowledge by creating an environment where healthy choices are feasible. However, it should be recognised that health promotion in schools is not a static phenomena but process driven thus requiring commitment and continuous adaptation through monitoring and evaluation (Denman, 1999).

2.5 Developing an action plan in the core action group

The action plan should:

- have a clear rationale focussed on improving the nutritional status of children;
- have a long-term vision of how the activities will be sustained while achieving maximum benefits;
- include precise objectives with feasible timelines and milestones;
- offer guidance on designing children's diets to all catering staff, teachers, parents and caregivers;
- detail how objectives will be achieved and who will be responsible;
- be realistic, flexible and as easy to implement as possible;
- fit into the overall school development plans; and
- provide a system for monitoring and evaluation.

2.6 Action plan implementation, monitoring and evaluation

Monitoring and evaluation are systematic processes essential to evidence-based policies. Their aim is to assess the progress of ongoing activities, measure effectiveness and efficiency of desired outcomes and identify needs for early corrective action. After initiatives have been implemented, child health should be monitored via school nutrition and health services to evaluate their success.

The evaluation process provides useful strategies for a more comprehensive approach to programme evaluation. Programme evaluation analyzes the extent of implementation, commitment to the programme, coverage, use of materials, environmental mediators (e.g. teacher training), curriculum, parental involvement, participation in family activities, attendance at evening activities, school food services, staff and community support. For each intervention, specific indicators and methods have to be developed using peer educators, classroom observations or school meal observations. Curriculum implementation can be evaluated with teachers and via teacher training by developing methods to compare teacher self-reporting with classroom observations. An inadequate curriculum implementation weakens the impact of school health education programmes. Analysis of issues such as school attendance, family involvement and obstacles to dietary change can also be useful.

Evaluation may lead to the revision of some of the provisions of the school policy. Evaluation of process must be sensitive and involve the collaboration of all participants (Pérez-Rodrigo & Aranceta, 2001) – thereby policy design should be a continuous and open process.

3. Elements of the food and nutrition policy for schools

3.1 The school community

3.1.1 Parents and care givers

Parents and care givers must be involved if school-based initiatives targeted at food and nutrition are to have a lasting effect on pupils' health. Müller et al. (2001) observed, in their study on obesity prevention in children (KOPS), considerable improvements in health-related behaviours after a combined "school" and "family-based" intervention compared to an exclusive "school-based" intervention. Including parents in school food and nutrition programmes is beneficial for several reasons. Children need support from their parents to implement nutrition knowledge learnt in school. In addition, changes in positive eating behaviour last longer if interventions are aimed at family attitudes and habits rather than individuals alone. Furthermore, parents can benefit from the information to improve their own health and nutrition behaviour (Crockett, Mullis & Perry, 1988). Parental involvement enhances the effectiveness of programmes by stimulating awareness about food and nutrition so that the variety in the diet and the availability of healthy foods at home can be increased (Perez-Rodrigo & Aranceta, 2001).

There is a correlation between mothers and preschool children's nutrient intake. Similarly there is a relationship between mothers' health motivation and the quality of their children's diets. Children's food preferences change through observation of peers and elders. Research indicates that children not only model their parents' food intake, but also their attitude to food and body dissatisfaction. Many studies indicate that children reflect their parents' unhealthy eating habits. Some studies have focussed on this modelling effect while others have investigated the effect of parental attempts to control children's food intake. It appears that parents' efforts to impose control over food intake or use food to improve children's behaviour are unsuccessful. It is possible that enforced food restriction by parents has the paradoxical effect of triggering overeating in children (Brown & Ogden, 2004).

Attitudes about food are embedded within a complex set of emotions removed from hunger and satiety. The use of food to bribe children may detach food further from the hunger response and may promote an unhealthy relationship with eating. In contrast, providing a good role model and good examples of healthy eating may be more effective in forming healthy eating habits in children. The WHO therefore recommends the development of interventions that provide information to parents concerning meal content, size and timing as well as details about the potentially damaging influence of coercive feeding practices. In addition, it should be explained how children learn and that the model of parents healthy eating habits is crucial.

Families should be provided with information regarding school health, food and nutrition initiatives – with parents involved in the planning processes of the food and nutrition core action group. Those parents who are not participating directly should be kept up-to-date about new initiatives. The influence of additional child carers should also be appreciated. After-school clubs play an important role in the development of nutritional health and eating behaviour.

Consequently, the meals and nutrition messages provided contribute considerably to the child's knowledge and future health habits.

3.1.2 Community collaboration

The school community plays a vital role in supporting the concept of healthy schools (Young, 2005) and the development of sustainable food and nutrition policy. To improve children's nutritional behaviour patterns and knowledge, the community has to be involved in health promotion through collaboration with different sectors and stakeholders. Shared collaboration between ministries is central for strategic planning, whilst partnerships that include staff and pupils, parents, nongovernmental organisations and members of the local community are important to create a social and physical environment conducive to health – reflecting the diverse range of needs. The community approach to health promotion emphasises schools as one component of broader based health policy programmes (Denman, 1999). With local involvement, communities become a valuable resource for schools (Young, 2005) and contribute significantly to the sustainability of health promotion interventions.

3.1.3 Local retailers and farmers

In the UK, an estimated £220 million was spent during 1995 by children on their way to and from school. The most commonly purchased items were sweets, crisps and soft drinks (School Food Action!, 1996). A typical newsagent receives 49% of income from school children (The Food Commission, 2001). These findings emphasize the need for school food policies to address, include and encourage local retailers (confectionary retailers, newsagents and/or food vans) operating near schools to add healthier choices to their range; such as suitably packaged and affordable vegetables and fruits.

Collaboration between farmers and schools has multiple benefits, from the provision of nutritious, seasonal and regional produce for school children to field trips that allow pupils to learn more about food production, sustainability and ecological issues. Farmers can benefit by stimulating new market opportunities and also help children to understand the role of agriculture in society.

Collaboration with local farmers can:

- help children to understand more about methods of food production and cultivation, the role of animals and plants in the local environment and the importance of sustainable land management;
- provide fresh, nutritious, seasonal and regional produce;
- allow local farmers to stimulate new market opportunities; and
- support local agriculture and protect rural employment.

3.1.4 Media and publicity

Generating publicity for school food and nutrition initiatives encourages involvement of the local community in school activities, as demonstrated by the recent media attention to school meals advocated by celebrity chef Jamie Oliver in the UK. In addition, it is crucial to keep parents up-to-date on the actions and changes taking place within school in order to maintain their support.

3.2 School curriculum

Education in good nutrition and personal health, that includes economical and ecological food preparation, consumer rights and understanding food labels, is crucial to developing healthy, responsible and sustainable lifestyle habits in children. School-wide messages must be consistent, mutually reinforcing and reflected throughout the curriculum.

A report published in England highlighting good and poor practices in nutrition education revealed that:

- examples of effective practice were seen in all settings but in only a minority of schools;
- the most effective practice was driven by the aim to educate children to make informed and independent food choices;
- systematic programmes contributing to knowledge of nutrition and healthy eating were rare;
- teachers and others involved in food and nutrition education lacked the knowledge, confidence and competence to effectively teach food preparation; and
- the meals provided in most schools did not complement the healthy eating messages that the teaching sought to convey.

Efforts to integrate food and nutrition into different school subjects have been attempted throughout Europe. However, teaching modern food skills and healthy eating requires appropriately qualified teachers and adequate resources. Efforts to improve the quality of food available in schools should be supported with compulsory nutrition education and cooking classes for both boys and girls, taught by specialized teachers. Home economics as a subject requires improved promotion and marketing as a contemporary and future orientated subject. The curriculum needs to cover several broad categories:

- nutrition and personal health;
- food preparation, preservation and storage;
- consumer awareness and rights and media literacy;
- food and emotional development (body-image, self-esteem, children's own responsibilities);
- food production, processing and distribution, sustainability and ecology; and
- eating habits and sociocultural influences (Dixey et al., 1999; see also step 10 below).

Basic food preparation and cooking skills are essential. Children need to learn how to cook as their parents often do not have the skills to teach them. In addition to practical applications, nutrition education should also encourage children to read nutrient content tables on packaging, in an effort to develop an understanding of the variation in nutrient content and energy density of foods, as well as of their own daily requirements. For example; adolescents should be familiar with and able to interpret terms such as “only 10% fat”, “low in sugar” on food labels.

3.2.1 Life skills

Life skills, defined by the WHO, are abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands of everyday life. Life skills are psycho-social and interpersonal competences that enable informed decisions, problem solving, critical and

creative thinking, effective communication, healthy relationships, empathy, general health and productivity (WHO, 2003b). Pupils need to acquire healthy life skills specific to nutrition including:

- communication skills to persuade parents and friends to make healthy food choices;
- refusal skills to resist social pressures to adopt unhealthy eating practices;
- advocacy skills to present messages of healthy nutrition to others and gain support of influential adults;
- decision-making skills to choose nutritious foods and snacks; and
- critical thinking skills to recognize aggressive marketing and evaluate nutritional claims in advertising and news stories (WHO, 2003b).

3.2.2 Educational materials

A wide range of food and nutrition educational materials are available throughout Europe (see Annex 2). All educational resources should be evaluated carefully by national experts from both scientific and ethical points of view, especially materials sponsored by food manufacturers. The Nutrition Task Force (1996) has developed a list of 12 guidelines on how to evaluate food and nutrition education materials.

- Educational material should acknowledge the main sources on which it is based.
- If there is controversy over an issue in the material, it should be acknowledged.
- Educational material should not be misleading and information should not be open to misinterpretation.
- Statements about aspects of nutrition should be placed in the context of a healthy diet.
- The name and address of any sponsors should be clearly stated along with contact names and addresses of the publisher.
- The date of the publication should be clearly marked on the material.
- Abbreviations or acronyms should be explained in full the first time they are used.
- Logos, trade names and illustrations should preferably not be used at all or at most be limited and used in a relevant context.
- Educational materials should be based on the principles of a healthy diet as recommended by the government.
- Educational materials must be appropriate to the intended users in layout, content, level of knowledge, language and complexity of ideas.
- If the materials are designed for use in schools, they have to be authorized by the national authorities and referenced in the national curriculum.
- The educational material must be sensitive to the needs of all social groups.
- The material must recognize the complexity of the social and cultural messages attached to foods and the effects that certain messages may have on the most vulnerable.

3.3 The school environment

3.3.1 School meals

Major differences exist in the provision of school meals throughout European school systems. Schools in Finland, France, Sweden and the UK must provide lunch everyday, whereas in Austria, Ireland and Norway individual schools choose whether to offer lunch or not. In Scotland, for example, hot school meals are provided every day during the week, whereas in Denmark, Greece and the Netherlands pupils have to bring packed lunch from home (Dixey et al., 1999).

In other countries changes in the traditional school meal system are taking place. For example, the German school system which is currently part-time, is due to alter to an all-day system (Heindl, 2003). This reorganisation provides an opportunity for a new healthy approach to school meals, based on best practice examples from other European countries. Finland's unique system of free lunches in primary and secondary schools is a good model for Europe. By law, the lunches provided have to meet one third of the pupils' daily nutritional requirements (KTL, 1999).

Unfortunately school meal services do not always have a good reputation among pupils, parents or the public. The two most common complaints are long queues and cramped, overcrowded dining areas (School Food Action!, 1996). An unfriendly eating environment has major consequences on eating behaviour. It has been observed that plate waste increases in overcrowded (Kjörstad and Lund, 2003) and noisy (Sanchez and Contreras, 2003) lunchrooms. Apart from resulting in a direct economic loss, this may lead to children not fully benefiting from all the nutrients offered (Guthrie and Buzby, 2002) or the food. Pupils who have not eaten well at lunchtime are encouraged to consume fast food or unhealthy snacks.

Another concern is the short time made available for meals in many schools. The Partnership to Promote Healthy Eating in Schools, formulated by the USDA, found providing enough time for pupils to choose meals and socialize with friends was important for the development of healthy eating habits. Studies in Wales have indicated that children have an average of 3–18 seconds to choose lunchtime meals (Fairchild and Collins, 2006). Lunch breaks provide an interval in the daily routine and allow students to return to class refreshed (Conklin et al., 2002). Children want to use lunch breaks for play and physical activity, but long queues and poor service reduce the available time, leading to skipping lunch or buying unhealthy food outside the school. In order for pupils to enjoy their lunch in a relaxed and social atmosphere, schools should permit them at least 20 minutes for eating after they arrive at the table with their food (Conklin et al., 2002).

Healthy school meals eaten in a friendly atmosphere can give children:

- assurance of at least one balanced meal per day, especially children from underprivileged families;
- an opportunity to learn how to enjoy food and eating;
- an opportunity to practise healthy eating behaviour and experiment with new foods; and
- an opportunity to practise social skills.

Different countries have established guidelines on how school lunches should be composed. In the United Kingdom for example, the national nutritional standards for school lunches have been made compulsory since April 2001. Requirements for the availability of certain foods (starches,

vegetables and fruit, milk and dairy products, meat, fish and alternative sources of protein) have to be observed by school meal providers. In English secondary schools the Food Standards Agency (FSA) and the Department for Education and Skills carried out a survey that found the majority of schools meet nutritional standards. Key findings of this second report were as follows.

- While many schools followed healthy cooking practices (frying in vegetable oil and using skimmed milk, for example) other healthy practices were followed by only a minority (15% restricted access to table salt, 17% used low fat spreads in sandwiches). Rather than serving oven-made fried potatoes (which are lower in fat) 99% of schools fried their potatoes in fat.
- Only one quarter of head cooks and catering managers had received training in healthy eating or cooking.
- Sixty-one per cent of schools provided documentation of specifications relating to healthy eating. While the language in the documentation was worthy and indicated strong commitment to the notion of healthy eating, it was largely general and failed to specify tight contractual structures to ensure that providers delivered meals with a healthy nutritional profile and to encourage children to make the healthier choices.
- There was little reference to controlling the salt content of school meals, access to salt by pupils or the prevention of obesity.

Healthy school meals should be based on dietary guidelines to allow, along with the food and nutrition policy, a positive impact on pupils' health and nutritional behaviour.

3.3.2 Breakfast clubs

Results from the international study *Health behaviour in school-aged children* have shown that on average only 69% of boys and 60% of girls have breakfast every morning on school days (WHO, 2004a), with great geographic differences ranging from 44% of 11-year-olds in Slovenia to 90% in the Netherlands; 36% of 13-year-olds in Slovenia to 79% in Portugal and 34% of 15-year-olds in Israel to 75% in Portugal. Reasons given for not having breakfast include lack of time, a stressful atmosphere in the morning or a lack of appetite (Joosten, 2006). Without breakfast, pupils suffer from a lack of concentration resulting in poor academic performance and psychosocial functioning. In many cases a lack of breakfast causes pupils to eat junk food as sweets, potato chips and high sugar soft drinks are the only available option at school (Harvey, 2004). Schlundt et al. (1992) concluded that one of the major advantages of eating breakfast was the reduction of unplanned, impulsive snacking on foods high in calories and fats.

Evidence shows that pupils, as well as staff, can benefit from setting up breakfast clubs in schools. Kleinman et al. (2002) found an improvement in attendance, punctuality, math grades and behaviour in children who attended a breakfast club for six months compared to children who did not. Eating breakfast also seems to improve cognition (Benton and Parker, 1998). In a school breakfast study, Murphy et al. (1998) found that pupils reduced psychosocial problems like depression, anxiety and hyperactivity, in addition to improving their academic performance, attendance and punctuality. Breakfast clubs in the UK also reported many benefits (The Food Commission, 2001). Teachers reported improved concentration of pupils in morning classes, speedier integration into the school day, improved social skills and interaction across year groups and improved social contact with school staff. The provision of breakfast at schools offers pupils and teachers the possibility of social interaction, and starting the day well fed and on time.

Eating breakfast at school can be used as an opportunity for children to experience tranquillity, communication and pleasure and to acquire social skills.

Pupil and parental involvement in breakfast clubs increases success. Breakfast schemes may also include local farmers and companies, for the provision of products i.e. milk. The Pestalozzi Förderschule in Brühl, Germany⁵ has started a Breakfast Company, where once a week pupils prepare a healthy and seasonal breakfast and sell it to their peers. The project teaches children about nutritional issues as well as aspects of trading and management.

3.3.3 Vending machines

School vending machines have been criticized for promoting unhealthy snack foods and soft drinks. In many cases they are the only available products during lesson breaks. Sweetened drinks may constitute the primary source of added sugar in the daily diet of children (Harnack et al., 1999) and increase overall energy intake (James et al., 2004). Soft drinks are high in sugar and low in nutrients are referred to as “liquid candy”, only providing “empty” calories (Nestle, 2002). Children who drink one regular (265 ml) carbonated drink per day have an average of 10% more total energy intake than non-consumers (Ludwig, Peterson & Gortmaker, 2001). Children who consume large quantities of drinks rich in sugar are more likely to gain excess weight (Raben et al., 2002). A positive energy balance of just 120 kcal (equivalent to one can of soft drink) each day would cause a weight gain of 4.5 kg per year – that over a four-year period could cause a normal weight child to become obese. Soft drinks have replaced milk and thereby may possibly lead to calcium deficiency, with a potential risk of osteoporosis and fractures, in adulthood. In addition, soft drinks are the single greatest source of caffeine in a child’s diet, and pose a risk of dental caries due to their high sugar content as well as enamel erosion because of their acidity (Moynihan and Petersen, 2004). Vending machines containing soft drinks and fruit-flavoured drinks should not be allowed at schools for young children.

It is very difficult for schools to avoid vending machines stocked with the usual high-sugar or high-fat products. However, vending machines could be used to sell healthier options like water, milks, juices and low-fat snacks (Harvey, 2004). An FSA study (Harvey, 2004) investigated the economic viability of selling healthier drinks from vending machines in 12 schools. The drinks included bottled water, pure juices, flavoured milk and semi-skimmed milk. The nine schools that completed the project demonstrated that children will buy a range of healthier products from vending machines when available even though they are not the usual brand products. Even though all schools commented on the positive aspects of the healthy vending machines and described them as a “benefit to the whole school”, not all were commercially successful. The commercial success mainly depended on the location of the machines, their reliability, staff commitment and customer care.

If a complete ban of vending machines is not possible the introduction of healthier options should be carried out with the aim to decrease sugar, fat and food additive consumption, increase water, and encourage low fat milk and dairy product consumption.⁶

Similar to vending machines, school snack bars have also been criticized for selling high-sugar and high-fat products. Making healthy snacks and drinks available in snack bars can help pupils experiment with new foods as well as put into practice what they learn in the classroom. A number of schools in Europe have decided to stop snack bars from selling soft drinks, chocolate

⁵ http://www.learn-line.nrw.de/formulare/beitragview.php3?beitrag_id=224

⁶ See Annex 3

bars, sweets and crisps replacing them with healthy alternatives such as fruit and vegetables sticks, sandwiches and dairy products.

3.3.4 Fruit, vegetable and milk subscriptions

By increasing the availability of fruits and vegetables, school fruit subscription programmes can help build good eating habits, increase children's well-being and thereby promote better health. As well as promoting good health, eating at least five portions of fruit and vegetables a day can help prevent cancer, coronary heart disease and other diseases. Eating fruits and vegetables can also reduce the symptoms of asthma and bronchitis and can help in tackling obesity. Results show that too many children all over Europe do not consume enough fruits and vegetables. In the UK, the government's National Diet and Nutrition Survey has shown one in five 4 to 18-year-olds eat no fruit at all in a week (Department of Health, 2002). Moreover, the proportion of pupils eating fruit and vegetables on a regular basis decreases with age (WHO Regional Office for Europe, 2004).

Several countries in Europe have established local partnerships (see box 1) and promote fruit and/or vegetable consumption through subscription schemes in schools. In the Netherlands, nearly 100% of pupils in 70% of schools participate in the *School Gruiten* programme (Meyer, 2003). The School Fruit Programme in Norway is a subsidized subscription scheme where each pupil gets an apple, pear, carrot, banana or orange each day in school (Bere et al., 2005). The programme was initiated in response to the fact that only 2 out of 10 pupils took fruit and vegetables to school to eat during the school day and has significantly increased child consumption (Bere et al., 2005). It is organized by the schools themselves with participation by the pupils. Fresh fruit and vegetables are delivered to schools twice weekly, making refrigeration unnecessary.

Box 1. Examples of local partnerships

- Farms for Schools⁷
- Country Classroom On Wheels⁸
- Bio Food Tour in Germany
- Duchy Originals HDRA Organic Gardens for Schools⁹

Similarly, since 2004, a national school fruit scheme in the UK has provided every 4–6 year old child with a free piece of fruit every school day. The programme gives equal access to all children, including those from low-income disadvantaged families, which according to national data have lower fruit and vegetable consumption than their high-income counterparts. The fruit (bananas, oranges, pears, apples, and plums) is delivered to schools three times a week. Teachers found that distributing the fruit in the morning breaks in the individual classes could encourage a sharing, calm and social time (Department of Health, 2002). However, despite the reported success of the programme in increasing consumption both at home and at school (Carey, 2006), monitoring and evaluation is important. The programme effectiveness requires detailed

⁷ www.farmsforschools.org.uk/index.htm

⁸ www.nci.org.uk/ccow.htm

⁹ http://hdra.org.uk/schools_organic_network/

assessment to ensure that fruit provided by schools does not act as a replacement for that normally received at home.

In the last few years there has been a decline in milk consumption in schools in some European countries. Many schools have stopped providing school milk programmes due to declining stakeholder interest, notably dairies and parents. Pupils' own interest in subscribing to school milk schemes is low, especially among older pupils, who often perceive milk as an old-fashioned and dated product (Svensk Mjölk, 2003). In Germany consumption of milk in schools has decreased by over 60% since 1994; only 1% of the milk produced in Germany is dispersed in schools (Talking Food, 2004). In 2000 only 4.6% of pupils in Bavaria took part in the school milk programme (Bayrischer Landtag, 2001).

Even though there is reduced demand for school milk subscription schemes in some European countries, the programme thrives in others. In Portugal, for example, school milk programmes have been running for 20 years and have reached more than 99% of schoolchildren (FAO, 1998) improving the nutrition and school attendance of Portuguese children (Svensk Mjölk, 2003a). In the Czech Republic, milk is distributed to the 85% of schools taking part in the milk subscription schemes by a public benefit organization. The products sold are long-life UHT dairy products, allowing those schools that do not have sufficient refrigeration to take part in the programme. With Government funding, all children 6–15 years old are entitled to two packets of milk or yoghurt per week, free of charge, and can buy dairy products below the retail level during the rest of the week (Svensk Mjölk, 2003b). In some areas of Austria, local farmers sell dairy products directly to schools, thus providing fresh, good quality products. In some cases they also fill the gap left by dairies withdrawing from the school milk programmes for economic reasons.

School milk programmes may play an important role in decreasing the risk of osteoporosis later in life (Zwiauwer, 2003). School milk can help pupils who come to school without having eaten breakfast to maintain their concentration level and prevent hunger before lunch time (Talking Food, 2004). School milk programmes represent an important vehicle for the promotion of milk in the children's diet. Evidence from Denmark, for example, shows that milk consumption in school increased by 40% when a school milk scheme was introduced (FAO, 2004).

School milk programmes are eligible for a subsidy of about 20% of the cost of the milk used due to the EU Common Agriculture Policy (CAP). In Finland and Sweden the programmes cover a high proportion of the school population; free milk is provided for pupils until they complete secondary school (FAO, 2004). Milk and dairy products distributed in school milk programmes should be low in both fat and salt. An analysis by Sweden's National Institute of Public Health (2003) concluded that the EU CAP has led to patterns of milk consumption that are not in line with dietary recommendations. The EU perspective on subsidized school milk is that it is "a measure to help expand the market for milk products" and a "surplus disposal mechanism". An important change took place in 2001, when skimmed milk and other low-fat products were entitled to support. However, full-fat products still received the highest subsidies in 2001 (see table 1).

Table 1: School milk subsidies in 2001

Dairy product	Fat content (%)	Subsidy (€/100 kg)
Whole milk & yoghurt	> 3	23.24
Standard milk	3	21.82

Semi-skimmed milk	1.5	17.58
Skimmed milk	< 1.5	13.34

Considering the above evidence, fruit, vegetable and milk subscription schemes can:

- offer access to fruit, vegetables and low fat milk at least once a day to all children
- give children the health benefits of fruit, vegetables and low-fat milk
- expose children new varieties of vegetables and fruits
- help children to develop a habit of healthy eating
- contribute to prevention of constipation and osteoporosis
- supply children who come to school without breakfast with nutritious food
- decrease soft-drink and unhealthy snack consumption
- involve local farmers and local businesses.¹⁰

3.3.5 Access to water

Studies have shown that European children and adolescents do not drink enough water (Sichert-Hellert et al., 2001). This may be due to the fact that drinking facilities and access to water in many schools are highly unsatisfactory. Almost 10% of schools in the United Kingdom do not have any drinking facilities at all and most teachers do not allow pupils to drink during lessons (The Food Commission, 2001; AID, 2004).

An adequate intake of fluids is necessary for the body to function properly. Thirst signals the first sign of dehydration – at which point mental performance and concentration will already have decreased by 10%. This can have serious negative effects on academic performance at school. Thus, it is important to raise awareness among teachers of the need for adequate fluid intake and to encourage pupils to drink enough water. Pupils will concentrate better when not distracted by feelings of dehydration: thirst, tiredness and irritability. Ensuring free access and promoting regular intake throughout the school day should be promoted in schools as water is the best choice for meeting daily fluid requirements.

An increase in fluid intake can:

- contribute to pupil and teacher well-being;
- improve mental performance, especially by frequent intake of small amounts of water; and
- help pupils concentrate because they are not distracted by feelings of dehydration.¹¹

The ‘Water in school is cool’ campaign, launched by the Enuresis Resource and Information Centre (ERIC),¹² emphasises water as the best and most practical option at school for improving children’s fluid intake. Published material should be made available for teachers to increase understanding about the importance of drinking water. The German impartial information

¹⁰ See Annex 3

¹¹ <http://www.trinken-im-unterricht.de>

¹² <http://www.eric.org.uk/>

service on protection of the consumer, nutrition, agriculture and environment (AID),¹³ has published material for teachers on how to address the topic of drinking water in school.

3.4 School nutrition and health services

School nutrition and health services should incorporate education and reinforce the curriculum. Health professionals should be offered pedagogical training, i.e. in Austria where a three-semester course (145 hours) exists.¹⁴ On a smaller scale in individual schools or communities, health professionals could be invited to give presentations about relevant topics several times per semester, for example monitoring overweight and obesity trends.

School health professionals can:

- regularly monitor growth and development via health passports schemes
- give teachers the benefit of their expertise
- teach health issues directly to pupils
- facilitate collection of data on children's nutritional health
- monitor health trends, including overweight and obesity.

Supportive school services should include feedback and referral for parents and children to ensure development is monitored and the needs of pupils requiring special assistance are met, i.e. via health passport schemes (see box 2). All members of staff including catering managers and assistants should be involved in capacity-building and training to raise awareness of food and nutrition issues within the whole school community. Appropriate activities include training for staff and teachers, seminars to which health professionals are invited and involvement of the wider community, i.e. parent information evenings.

Box 2. Health passport schemes

Health passports provide each pupil with a report card used to document individual health data. Each child (and thereby parent/caregiver) is provided with a card used to monitor individual health, set targets for improvement and prevent the development of overweight and obesity. This scheme has proved successful among adolescents in Austria.

Involving school health services in the implementation of food and nutrition policies is both necessary and useful. Health service staff should acquire expertise in nutritional health and share it with the pupils and teachers. School doctors and nurses could help children with health issues, either in small or large class groups. Coordination with biology teachers to address certain subjects, or teaching topics within life science lessons are also ways in which health professionals can enrich the school health service. A combined nutrition and pedagogical qualification could be developed, as part of the course leading to a school health professional qualification.

¹³ <http://www.aid.de>

¹⁴ <http://www.arztakademie.at>

Data collection by school health professionals in their yearly examination of pupils should also be standardized and computerized for monitoring individual health and for surveillance purposes.

4. Recommendations for healthy eating and active lifestyles for children and adolescents

The aim of these guidelines is to provide a resource for the development of school food and nutrition policies for nurseries, preschools, primary and secondary schools. The guidelines focus on enhancing the ability of school food services and related staff to provide healthier nutrition. The recommendations, however, are applicable to child dietary management, and the preparation and consumption of food in the home as well as in the school setting.

The dietary guidelines are based on knowledge surrounding the diet of children in countries of the European region and on the nutrition goals developed to minimise the onset of diet related diseases. To ensure feasible and effective implementation, dietary guidelines must take account of national or regional dietary patterns and habits. Professionals should review the available information on diet and nutritional status and eating patterns before developing dietary guidelines and tailor them to correspond with local conditions. Moreover, they should be in accord with sustainable public health policies that promote a healthy environment and the local food economy.

Specific recommendations in different parts of Europe will vary depending on the variety of foods available. For example, consumption of rye bread should only be promoted in parts of northern Europe where it is grown. It would be unrealistic to expect communities unfamiliar with rye bread to eat it regularly.

The following recommendations highlight 12 key areas for action. Box 3 summarizes these steps; each of which is accompanied by a detailed explanation in the following pages. It is important that each step not be considered in isolation, but rather in the context of all the others steps and explanations.

Box 3. Twelve steps to healthy eating for children and adolescents

1. A nutritious diet should be based on a variety of foods originating mainly from plants, rather than animals.
2. Bread, grains, pasta, rice or potatoes should be eaten several times a day.
3. A variety of vegetables and fruits should be eaten, preferably fresh and local, several times a day.
4. Fatty meats and meat products should be replaced with beans, legumes, lentils, fish, poultry or lean meat.
5. Low-fat milk and low-fat, low-salt dairy products (kefir, sour milk, yoghurt and cheese) are preferable.
6. Fat intake should be limited to not more than 30% of daily energy and most saturated fats should be replaced with unsaturated vegetable oils or soft margarines.
7. Foods that are low in sugar should be preferred and refined sugar used sparingly, with limited frequency of sugary drinks and sweets.
8. A low-salt diet is best. Total daily salt intake should be limited to 2 g for 1–3 year olds, 3 g for 4–6 year olds and 5 g for 7–18 year olds, including the salt in bread and processed, cured and preserved foods. Iodized salt should be used where iodine deficiency is endemic.
9. Food should be prepared in a safe and hygienic way. Steaming, baking, boiling or microwaving helps to reduce the amount of added fat.
10. Young children should be introduced to food handling and cooking processes and encouraged to join in food preparation safely, whenever possible. Older children and adolescents should also learn about the preparation of food and cooking processes. All age groups should learn the importance of a healthy diet.
11. The benefits of breastfeeding compared to infant formula should be explained to children and adolescents.
12. Children and adolescents should learn to enjoy physical activity and reduce time spent passively on TV, video and computer games in order to maintain normal growth and body weight within the recommended limits.

Adapted from: WHO, 2000.

STEP 1. A nutritious diet should be based on a variety of foods originating mainly from plants, rather than animals

It is important to eat a wide variety of different plant foods to ensure an intake of all protective nutrients and other substances. In addition to nutrients, food contains combinations of other substances, most of which abound in plants. Plant foods contain many biologically active components related to their potential protective role against diseases, for example dietary fibre and related substances, i.e. phytosterols, lignans, flavonoids, glucosinolates, phenols, and terpenes. Taking vitamin supplements or extracted plant substances as a replacement for, or supplement to, good wholesome food is unnecessary and not generally recommended, especially for children and young people. A healthy diet must therefore contain a large variety of the plant foods as no single food can supply all nutrients. The varieties of foods required from the diet are illustrated in the food pyramid in section 5.

STEP 2. Bread, grains, pasta, rice or potatoes should be eaten several times a day

Wholemeal bread, grains, pasta, rice or potatoes should form the foundation of all meals. In addition to plant based foods, the WHO (2003) recommends that young children obtain around half of their daily energy requirement from this food group as shown in the food pyramid (see section 5). In addition to providing energy, foods in this group contribute significantly to the intake of protein, fibre, minerals (potassium, calcium and magnesium) and vitamins (vitamin C, folate, B6, carotenoids). Their nutritional benefits for children and adolescents should be further promoted.

Unfortunately a mistaken belief exists that that bread and potatoes are more fattening than other foods. The energy content of starch is actually much lower than that of fat. Starch provides only 16 kJ (3.8 kcal) energy per gram; the corresponding figure for fat is 38 kJ (9.1 kcal).

Similar to grains and potatoes, all types of bread contain different types of dietary fibre (especially whole-grain varieties). In addition, different forms of fibre are present in legumes, beans, vegetables and fruit (see step 3). Eating a variety of fibre-containing foods is important for digestive health, especially preventing constipation in children and adolescents.

The importance of eating plenty of whole-grain bread, grains, pasta, rice and potatoes is often undervalued with an overemphasis on the importance of animal protein for children. Much less emphasis should be placed on the need for young children to eat animal protein; proteins from plant sources are equally beneficial. Outdated ideas about protein requirements have resulted in an unnecessarily high intake of meats and meat products in European children and adolescents. Those concerned about possible protein deficiency need to be reassured that bread, pasta, beans, peas contribute most of the protein required for a healthy diet. Health professionals have a key role in correcting this perception and reversing the decline in potato and bread consumption. Eating large amounts of cereals and bread (preferably whole-grain), and potatoes should be promoted as the foundation of a healthy diet for children and adolescents.

STEP 3. A variety of vegetables and fruits should be eaten, preferably fresh and local, several times a day

Eating a wide variety of fruit and vegetables throughout the year – at least five servings a day (see section 5), ensures an adequate intake of most micronutrients, dietary fibres and essential non-nutrient substances (see step 1). Moreover, vegetables and fruits are low in fat, thus reducing the risk of obesity in children.

Results from the WHO *Health behaviour in school-aged children* (HBSC) international study (WHO, 2004a) show that on average fruit and vegetable consumption of children and adolescents is very low; only 30% of boys and 37% of girls reported eating fruit daily and less than 50% of all young people report eating vegetables daily (28% of boys and 34% of girls). In 16 countries and regions, more than 25% of young people consume fruit once a week or even less. Moreover, the proportion of pupils eating fruit and vegetables on a regular basis decreases further with age.

It is commonly reported that children do not like the taste of vegetables because of an aversion to foods that taste sour (Thomas et al., 2003). According to Pliner's finding, "mere exposure to unknown food – the repeated experiences of tasting and eating it – reduces the tendency to reject it". Consequently, children's preference for vegetables increases with exposure (Pliner, 1982; Wardle et al., 2003). Appropriate portion size and presentation should be considered (Thomas et

al., 2003). It is sensible to promote fruits and vegetables in different presentations, portions and combinations, with vegetables used as main dishes.

A prevalent public health problem notable among young children in the WHO European region, is anaemia, mainly a result of iron and other micronutrient deficiency. The intake of vitamin C (present in most vegetables and fruits) along with iron-rich foods such as beans and lentils improves the absorption of iron and so reduces the risk of iron deficiency anaemia. In addition, many vegetables contain iron. The best sources are leafy greens, such as broccoli, kale, turnip greens and spinach. The absorption of the iron in vegetables is enhanced if accompanied by small amounts of lean red meat, liver, fish or fermented products. Other trace elements and minerals, such as potassium, magnesium and calcium, can also be found in vegetables and fruits and prevent micronutrient deficiencies in young children and adolescents.

Fruits and vegetable are also rich in additional micronutrients particularly B vitamins, including folate and B6. Foods with high levels of folate are important, particularly in adolescent girls and young women in preparation for parenthood. Folic acid has a well known role in preventing anaemia because it is needed for the production of red blood cells. Good sources of folic acid include green vegetables such as spinach, Brussels sprouts and broccoli as well as red beans, soybeans, lentils, chickpeas, peas, peanuts, bread, citrus fruits and liver.

Fruit and vegetables are valuable for the daily intake of both soluble and insoluble dietary fibre required by the human body. Insoluble fibres help to prevent constipation and maintain regular bowel habits in children. Fibre is obtained from a combination of foods identified in the base the two green layers of the food pyramid (see section 5).

Fresh fruits and vegetables offer maximum health benefits. However, the availability of fresh produce varies by season and region. The use of frozen, dried and preserved vegetables and fruits can help ensure a varied supply throughout the year. When serving or buying processed fruits and vegetables, children and adolescents should be offered those with a minimum amount of added fats, oils, sugars and salt, as indicated on the labels. Whenever possible, local environmentally safe varieties with minimal use of pesticides and chemicals should be selected.

STEP 4. Fatty meats and meat products should be replaced with beans, legumes, lentils, fish, poultry or lean meat

Legumes, beans, lentils and unsalted nuts, as well as meat, poultry, fish (including shellfish and sardines) and eggs, are important sources of protein and iron for children and adolescents. The range of foods that provide protein are illustrated on the right hand side of the orange layer of the food pyramid (see section 5). Along with milk and dairy products, meat and animal products contribute the largest percentage of saturated fat to the diet, particularly meat with a very high fat content. Fat of animal origin is mainly saturated and only small amounts are required to satisfy the nutritional needs of children and adolescents. Lean low-fat cuts should be selected and all visible fat removed. Meat products such as sausage, pies, salamis and tinned meats, usually high in saturated fat and salt, should be replaced with legumes, beans, lentils, fish, eggs, poultry or lean meat.

STEP 5. Low-fat milk and low-fat, low-salt dairy products (kefir, sour milk, yoghurt and cheese) are preferable

Most milk and dairy products provide many different nutrients, essentially protein and calcium. Calcium is required to ensure the development of healthy teeth and bones particularly during the

adolescent growth spurt, when body calcium stores are concentrated. The achievement of peak bone mass during childhood is therefore crucial to reducing the risk of osteoporosis in later life.

Fortunately, the majority of children can obtain enough calcium via consuming the recommended low-fat or skimmed milk and low-fat dairy products in moderate amounts as calcium is present in the main body of the milk, not in the cream. Different types of cream and sour cream should not be given to children and adolescents, since they contain a lot of saturated fat, and very little protein and essential micronutrients. In some countries people add sour cream (smetana, crème fraiche) to vegetables and other cooked dishes. This habit should be discouraged and low-fat yoghurt or other low-fat products should be substituted. Children who do not drink milk should be encouraged to eat more yoghurt or other fermented dairy foods. Table 6 provides information regarding the recommended daily servings and portion sizes for dairy products. Daily servings should be 2–3 and 3–4 for children up to and over the age of 11 years respectively.

STEP 6. Fat intake should be limited to not more than 30% of daily energy and most saturated fats should be replaced with unsaturated vegetable oils or soft margarines

Fats supply growing children with energy and essential fatty acids and promote absorption of the fat-soluble vitamins (A, D, E and K). Eating large amounts of certain fats, however, is linked to the risk of obesity.

The WHO (2003) recommends a maximum of 30% of energy requirements are derived from fat. The three main types of fats are: saturated, monounsaturated and polyunsaturated. Saturated fat should provide less than 10% of total energy intake and polyunsaturated fat around 7%. The remaining 13% should come from monounsaturated vegetable fat. Fatty foods normally contain a combination of all three types of fat in varying proportions. Approximately 50% of energy from fat in a child's diet should come from monounsaturated fats and the remainder from a mixture of saturated and polyunsaturated fats.

Saturated fats are mostly found in foods of animal origin, such as; meat and meat products, whole milk and dairy products, and some vegetable margarines, especially the ones that remain hard at room temperature. Many bakery products and commercially produced foodstuffs are also sources of saturated fat. High intakes of saturated fat are strongly associated with increasing levels of the potentially harmful LDL cholesterol and total serum cholesterol, even in children and adolescents.

Polyunsaturated fats come from two main sources, plant oils and oily fish. Many polyunsaturated fats are essential in the diets of children because they cannot be synthesized by the body. One group, the omega-6, comprise essential linoleic acid. This group promotes the absorption of antioxidants (vitamin E and carotenoids) and fat soluble vitamins. Sources include soft margarines and oils made from safflower, sunflower, corn and soybean and cottonseed oils. The second group (omega-3, namely linolenic acid) are found in canola oil and oily fish such as herring, mackerel, trout and sardines. Omega 3 oils are protective against the development of heart disease, stroke and related disorders.

“Trans” fatty acids are formed when vegetable and fish oils are processed via chemical hydrogenation from liquid to solid to produce hardened margarines. This process alters the physical properties of the fat allowing trans-fatty acids to have a biological function similar to

saturated fats. Most margarine manufacturers are aware of this problem, and many have reduced the level of trans-fatty acids in their products. Trans-fatty acids are however used widely in the production of many food products especially confectionary and cakes. Carers of children should therefore be encouraged to check labels on margarines and to seek information to ensure that processed foods for children do not contain trans-fatty acids.

The energy balance is disrupted when children and adolescents consume excessive amounts of fatty foods. Too much energy often causes the normal physiological process whereby appetite is controlled (which occurs after eating starch-containing food) to malfunction. This passive over-consumption of food leads to weight gain, particularly in inactive children. Reducing intake of all types of fats, including those present in prepared foods, helps limit energy intake and the risk of obesity. However, the complete banning of much desired food items can be counterproductive. Forbidden foods may be over-consumed when children become more independent and parental control over the diet wanes. Parents should therefore be encouraged to moderate, rather than totally ban, intake of 'offending' foodstuffs (National Health Service for Scotland, 2004).

STEP 7. Select foods that are low in sugar, and use refined sugar sparingly, with limited frequency of sugary drinks and sweets; discourage the consumption of alcoholic drinks in children and adolescents

Carbohydrates are subdivided into two main groups: starches (including some dietary fibres) and simple sugars, such as mono-saccharides and disaccharides. Starch, however, is the main form of carbohydrate found naturally in most foods.

In addition to providing energy, sugars produce the sensation of sweetness. Each type of sugar contributes the same amount of energy to the diet regardless of its sweetness. Processed foods may contain many different types of refined sugars: brown sugar, corn sweeteners, corn syrup, fructose, fruit juice concentrate, glucose (dextrose), high-fructose corn syrup, honey, invert sugar, lactose, maltose, molasses, raw sugar, table sugar (sucrose) or syrup. The type of sugar should be listed on the food label. Products on which sugar appears high on the ingredients list (or if several different types are listed) are considered to have high sugar content. None of these sugars are necessary in the diets of children and adolescents. Since they only supply energy and few nutrients, these sugars can be safely excluded from the diet, thus reducing the risk of obesity and tooth decay.

Frequent consumption of food and drink containing sugar increases the risk of tooth decay as they remain in the mouth for longer. Dental caries are highly prevalent in school children, the most important dietary cause being sugar, particularly sucrose, which is found in confectionaries, soft drinks, biscuits, cake, fruit juices, honey and sugars added to recipes. The frequency of consumption as well as the total amount of the sugars consumed is important in the aetiology of caries (Sheiham, 2001). Regular consumption is more harmful than eating sugar at meal-times and then brushing the teeth. Oral diseases are the most common of all illnesses in industrial societies. The rates of dental erosion, related to extrinsic and intrinsic acids, appear to be rising. This increase is mainly thought to be due to an increased consumption of acidic beverages such as soft drinks (Moynihan & Petersen, 2004).

Oral health has further health implications. Disorders of the teeth are a common cause of pain, disability and handicap. Poor oral health limits personal choices and social opportunities, and diminishes life satisfaction in the same way as diseases of other body systems. The most

prevalent oral diseases, dental caries and periodontal diseases, can be considered mainly as behavioural problems because they can be prevented. Good dental practices are therefore essential for all children and should be started early. Regular daily oral hygiene to prevent tooth decay must be maintained including brushing with fluoride toothpaste, in combination with good nutrition for healthy teeth and gums. Tips for healthy teeth and gums include:

- reduced frequency of sugary foods and drinks
- encourage calcium rich foods i.e. dairy products, which help build strong teeth
- substitute soft drinks for milk and water between meals
- dilute pure unsweetened fruit juice
- use sugar free alternatives of paediatric medicines
- avoid giving children sugary foods and drinks in-between meals.

In recent decades, dental caries has declined in many European countries but large socioeconomic differences persist in the uptake of preventive interventions and prevalence (WHO, 2004a). Oral health is closely linked to diet and nutrition with poor dietary practices increasing the risk of oral disease. Schools, by taking part in healthy nutrition initiatives which enforce healthy snacks or “no sugar” policies, can thereby promote improved oral health and food choices (WHO, 2003b).

The Boost Better Breaks (BBB) school-based initiative in Northern Ireland has tried to reduce the high prevalence of childhood dental caries. Primary schools and preschool groups in the programme allow only the consumption of milk and fruit during break times. Furthermore, the schools involved in the initiative have agreed not to sell high-fat or high-sugar snacks. In addition teachers agreed not to reward pupils with sweets. Results after the first two years have indicated that the number of children with sound teeth has increased compared to children in the control groups (Freeman et al., 2001).

Alcohol

During adolescence, teenagers not only consume soft drinks, but begin to experiment with alcohol. Although there is no scientifically safe limit of alcohol consumption, the intake of alcohol should be discouraged. Schools should maintain an alcohol-free environment. The WHO Declaration on Young People and Alcohol (2001) states all children have the right to grow up protected from the negative consequences of alcohol consumption (WHO, 2001b). As highlighted at the WHO European Ministerial Conference on Young People and Alcohol (2001), alcohol consumption is alarmingly high among adolescents, especially girls, who are subject to the aggressive marketing of a range of alcoholic beverages. Schools, as educational institutions, have proved to have an important influence on alcohol consumption (Setterobulte et al, 2001) and therefore have the responsibility of providing supportive environments minimizing the pressures of alcohol and alcohol related harm (WHO, 2001b). Schools may play a critical role in educating young people about alcohol related issues and establishing a healthy balanced approach to consumption among students.

STEP 8. A low-salt diet is best; total daily salt intake should be limited to 2 grams for 1–3 year olds and 3 grams for 4–6 year olds, including the salt in bread, processed, cured and preserved foods; iodised salt should be used where iodine deficiency is endemic

The Scientific Agency Committee for Nutrition (2003) recommends 2 grams (g) of salt per day for 1–3 year olds, 3g for 4–6 year olds, and 5g for 7–18 year olds. These guidelines are often exceeded as children consume large quantities of salt unknowingly due to the large amounts hidden in foods such as bread, cheese, and crisps, preserved and processed foods which are often marketed aggressively towards children. In Finland and the UK, for example, processed foods contribute approximately 80% of the daily salt intake, with only 20% added knowingly in cooking or at the table. The dangers of a diet high in salt include the development of high blood pressure, which can subsequently cause heart disease, stroke, renal problems and premature death. It has also been shown to increase susceptibility to carcinogens, giving rise to the development of cancer (European Public Health Alliance, 2006).

To reduce the amount of salt consumed, the food industry holds responsibility for reducing the amount of salt in processed and manufactured products, especially in staple foods such as bread (FSA, 2001), and snack foods marketed towards children. Salt is an acquired taste for both adults and children. Preference for salty food weakens, however, if salt intake is gradually reduced. The desire for salt disappears relatively quickly after reducing salt intake and consumers adapt to find salty foods unpleasant. The well documented success of gradual salt reductions in processed products (especially bread) across Europe is a direct result of collaborative action between industry, consumer groups and health advisories. Suggestions to help reduce daily salt intake include:

- food products that contain a lot of salt (smoked, canned, pickled and cured products as well as convenience food and ready-to-eat meals) should be eaten in small amounts and not on a regular basis;
- the consumption of low-salt foods such as vegetables and fruits should be increased;
- low salt varieties of breakfast cereals, dairy products and baking products should be encouraged for small children;
- the amount of salt added during cooking and food preparation should be reduced; instead, herbs and spices could be added to flavour food; and
- children should not be given salt at the table.

Iodine deficiency is common in some European countries, and poses a health risk to children. Foetal iodine deficiency can result in cretinism, characterised by stunted physical and mental growth. WHO and UNICEF recommend universal salt iodization (USI), which means that all salt used by schools and children's institutions should be iodized using potassium iodate especially in areas where iodine deficiency is endemic. Moreover, universal salt iodization includes the recommendation that cow fodder be iodized so that low-fat milk and milk products can also be a source of iodine. USI can be legislated, and all countries with endemic iodine deficiency should have properly enforced national laws. In the Netherlands, salt in bread is iodized; in Iceland, iodine is obtained mainly from fish. Other Nordic countries, Poland and the United Kingdom, use iodized fodder and therefore iodine comes mostly from milk and dairy products.

The promotion of iodized salt should not result in increased intake. The necessary monitoring of iodine intake through iodization is a unique opportunity to evaluate and monitor salt intake and

to respect the WHO (2003) recommendation to maintain it at or decrease it to less than 5 grams per day for children and adolescents.

STEP 9. Food should be prepared in a safe and hygienic way; steaming, baking, boiling or microwaving help reduce the amount of added fat

It is essential that food provided to children and adolescents be stored, prepared and presented in a safe and hygienic environment. Food should be prepared and handled in ways that best preserve its nutrients and limit the likelihood of contamination (Health Promotion Unit, 2004). Extra care is needed for very young children as they may have a lower resistance to food poisoning. It is also important to use cooking methods with minimum destruction of nutrients, for example, vegetables should not be over-cooked (Department for Education and Employment, 2000).

STEP 10. Young children should be introduced to food handling and cooking and encouraged to join in safe food preparation; older children should also learn about more advanced food and cooking processes; all age groups should learn the importance of a healthy diet

Over recent decades fundamental changes have taken place in eating habits and home environments. In many families, the time available for food preparation is limited as both parents are employed thus a large majority of meals consist of convenience products or are consumed outside the home (St-Onge, Keller & Heymsfield, 2003). Consequently, the opportunities for children to learn how to cook at home are declining at the same time as cooking skills are being removed from school curriculum because of time and cost factors. Many children and adolescents will grow up without having learnt the basic skills of how to provide themselves with a healthy diet. Eating out may be the only possibility to feed themselves, which may encourage the consumption of large portions of unknown calorific content (James, 2002).

The development of food preparation skills and involvement in the planning of meals and/or snacks for the family is therefore important and should be encouraged as children develop eating skills. Through this process, children learn to appreciate the value of food and can begin to understand both consumer aspects of foods and food preparation. Children enjoy helping in the kitchen and are often more willing to eat foods that they have helped to prepare and try different kinds of food. In addition, children adopt eating practices from parents and carers. Good models of healthy eating should therefore always be demonstrated.

STEP 11. The benefits of breastfeeding compared to infant formula should be explained to children and adolescents

It is important for children and especially adolescent girls to understand the importance of breastfeeding through practical experience. School teachers, parents and health professionals can introduce the subject. For example, a breastfeeding mother can talk about her experience with her children. For younger children, the introduction of a breastfeeding doll for children's play can aid their understanding.¹⁵

¹⁵ <http://www.aleitamento.org.br/ingles/mariana1.htm>

STEP 12. Children and adolescents should learn to enjoy physical activity and reduce time spent passively on TV, video and computer games in order to maintain normal growth and body weight within the recommended limits

Children practise progressively less physical activity as they grow older (Meredith & Dwyer, 1991). Between the ages of 12 and 18, the average amount of regular physical activity decreases by 50%; however boys are consistently more active and fit than girls. In all countries and across age groups 11,13 and 15-year-old boys report being physically active for at least an hour a day more often than girls: 4.1 days and 3.5 days, respectively. The gender difference varies, however. In 15-year-olds, for example, the difference is at least 1 day in Greece and Ukraine, and minimal in the Netherlands (WHO, 2004a).

Evidence from the UK also suggests that boys in general are more physically active than girls, spending an average of 14 and 11 hours per week on physical activity respectively. Gender differentials widen with age, with female activity declining as puberty approaches (Stamakatis, 2006). Physical activity also shows wide geographical variation. Measured by reporting the number of days per week that young people are active for an hour or more, levels range from 3.4 days in Belgium to 4.9 in Ireland for boys, and from 2.7 days in France to 4.1 in Canada for girls. Despite differences between age groups, some countries and regions are consistently in the top quartile: Belgium, France, Italy and Portugal (WHO, 2004a).

Increased physical activity should be promoted to children and adolescents of all ages. Healthy eating and regular physical activity contribute a healthy body. Active children and adolescents have increased metabolism and subsequently, better appetites. It should be noted that children are strongly influenced by the behaviour of parents and care-givers; active parents usually have active children. In addition, active children are more likely to be active adults, thereby reducing the risk of degenerative illness and chronic disease in later life.

Schools should be encouraged to incorporate physical activity frameworks into the whole school approach to health. Children's ability to practise physical activity is related to their development. Therefore, the type and intensity of activity should match age and ability. Younger children are not aware of the possible dangers during exercise and safety should always be maintained.

Physical activities (for example, running, jumping, cycling, climbing and throwing, catching or hitting a ball) and simple games (for example, chase or tag) are appropriate for young children. These activities should be play-based to be more attractive for children. They can also participate in developmentally appropriate organized play or activities (for example, tumbling, tag, gymnastics, dancing). Children under six years old do not have the motor skills or mental and emotional capabilities to participate in organized sports.¹⁶ Types of suitable activities include:

- endurance activities that strengthen the heart and lungs such as play-based running, jumping and swimming;
- flexibility activities such as gymnastics and dancing that require bending, stretching and reaching; and
- muscle-building and bone strengthening activities, such as climbing.

Activities combining all of these physiological characteristics are recommended (see table 2).

¹⁶ In this context, sport is defined as specialized and organized physical activity practised through exercise and/or competitions facilitated by sport organizations; thus it is a specialized type of physical activity.

Table 2. Physical activity recommendations:

Age (years)	
3–6	7–18
<ul style="list-style-type: none"> • a minimum of 60 minutes of varied, at least moderately intense, unorganized activity each day, in one session or several shorter sessions of at least 10 minutes (WHO, 2006b) • activities that are appealing, fun and safe for pre school children • opportunities for children and adults to be active together (Dieticians of Canada, 2003) • variation of activities through the week 	<ul style="list-style-type: none"> • a minimum of 60 minutes of varied, at least moderately intense, physical activity or sports each day, in one session or several shorter sessions of at least 10 minutes (WHO, 2006b) • activities to improve bone health (with high stress on the bones, e.g. jumping), muscle strength and flexibility at least twice a week; activities improving endurance should also be included for youth. • children under 10 years old should not concentrate their physical activity to a restricted sport discipline but mostly practise unorganized and varied play-related activities • activities that are appealing, fun and safe

5. Guidance on designing children’s diets

5.1 The food pyramid

A practical tool useful in the design of children’s diets is the Countrywide Integrated Noncommunicable Disease Intervention (CINDI) food pyramid, developed to assist in managing nutrient intake and food habits. The pyramid acts as a visual aid towards meeting the overall objective of the CINDI programme “to improve health by reducing mortality and morbidity from the major noncommunicable diseases (NCD) through interrelated collaborative interventions that prevent disease and promote health” (WHO, 2000). Incorporating the principles of Health21, the CINDI pyramid is designed to guide food purchase and consumption rather than focussing directly on nutrients (see Figure 2).

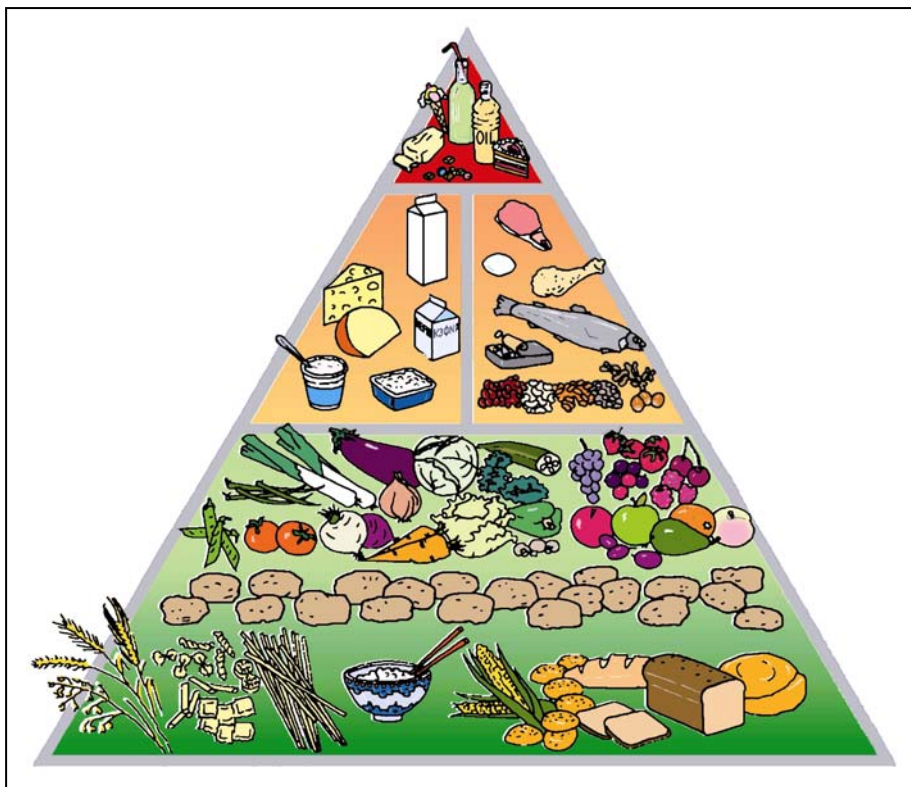
The pyramid uses a coloured traffic light scheme to aid the selection of food groups; green, orange and red representing ‘proceeding’, ‘caution’ and ‘consider before eating’ respectively. It clearly illustrates the range of foods from the different food groups required by individuals of all ages, including children and adolescents. The different food groups ensure optimal nutrient intake. It divides food into four major categories:

1. bread and cereal
2. fruit and vegetables
3. meat fish, poultry and alternatives
4. milk and milk products.

An additional group indicated in the red section at the top of the pyramid, includes foods high in fat, sugar and salt, which should be minimized.

Illustrating the variety and proportion of foods needed for a healthy diet, the CINDI guide not only helps individual food choices but also aids local, regional and national authorities in developing healthy eating strategies for mass catering institutions. It can therefore be used, in addition to the recommendations detailed in section 4, as a reference guide for all individuals responsible for the nutritional quality of children's diets, i.e. parents and caregivers, teachers and catering managers. Furthermore it can provide a framework for educational activities and curriculum development that form an important component of any school food and nutrition policy.

Fig. 2. The CINDI Food Pyramid



The four main food groups should contribute to the daily diet with the following amounts;

- bread and cereals: 4–6 servings (more if children are active);
- fruits and vegetables: 4–5 servings;
- meat, fish, poultry and alternatives (eggs, cooked dried peas, beans, lentils or tofu): approximately 2 servings;
- low-fat milk and milk products: 2–3 servings (up to 11 years old), 3–4 servings (over 11) daily, including 500 ml (2 cups) of low-fat milk; and
- food products high in fat, sugar and salt should be reduced to a minimum.

Providing children with a wide variety of food products throughout the week and offering portion sizes to match their energy needs, will ensure all the required nutrients are obtained. Offering a range of foods with different tastes, textures and colours will assist in satisfying small appetites. Children aged 2–3 years need the same variety of foods as 4–6 year olds but may require fewer calories. It is therefore sensible to offer them smaller amounts. A good estimation

of portion size for a 2–3 year old child is approximately two thirds of a regular adult serving. After four years of age, a child’s energy need per kilogram of body weight decreases, but the actual amount of energy required increases with age. From age five to adolescence is a period of slow but steady growth. More active children and young people should be encouraged to have larger portions of bread, potatoes, pasta, rice or milky drinks in order to meet the extra energy need resulting from additional physical activity (The Caroline Walker Trust, 2001). The energy requirement of adolescents generally tends to parallel growth rate, and individual energy needs are met with remarkable precision by means of appetite control. However, stress and emotional disturbance can seriously affect appetite control in adolescents, resulting in the consumption of too little or too much food. Mild or severe infection, nervousness, and menstrual, dental or skin problems can result in suppressed appetite, rendering adolescents, especially those on marginal diets, the most vulnerable.

The following tables illustrate further the contribution of the different food groups to the daily diet, providing serving suggestions and portion sizes for children and adolescents.

As demonstrated in the food pyramid, bread and cereal-based foods should form the basis of the diet. Children and adolescents should consume 4–6 servings per day.

Table 3. Recommended number of daily servings and portion sizes: Breads and cereals

Breads and cereals (<i>Examples of one serving</i>)	Age/Portion size (grams)	
	3–6 years	7–18 years
Rice	65–80 (cooked weight)	80–120 (cooked weight)
Potatoes (including sweet potatoes and yams)		
Mashed, boiled, croquettes	80–95	84–98
Jacket	100–120	112–170
Chips, roast, other potatoes cooked in fat	70–80	70–84
Bread and cereal		
Sliced bread, rolls, baguettes	40–60	56–70
Pizza	60–80	84–98
Cracker biscuits	40–60	42–63
Pasta		
Macaroni, spaghetti or noodles	75–95 (cooked weight)	100–180 (cooked weight)

Adapted from: Department for Education and Employment, 2000, 2005.

Dietary recommendations maintain that at least 400 grams of fruit and vegetables per person per day are beneficial to health; protecting against chronic disease, illness and premature death. This translates to approximately 5 portions per day – regardless of whether fruit and vegetables are frozen, fresh, chilled, canned or dried. Examples of the recommended intake of fruits and vegetables are given below in table 4.

Table 4. Recommended number of daily servings and portion sizes: Fruit and vegetables

Vegetables and fruits (Examples of one serving)	Age/Portion size (grams)	
	3–6 years	7–18 years
Vegetables		
Peas, green beans, sweet corn, carrots, cauliflower, broccoli,	35–50	56–70
Cabbage, spinach, spring greens and other leafy vegetables	40–50	42–56
Baked beans, tinned tomatoes	60–80	70–84
Coleslaw	25–35	28–42
Salad vegetables	40–50	42–56
Vegetable soup	150–170 (1 cup)	200–300
Fruit		
Apples, pears, orange, large bananas	50–100 (½–1 fruit)	50–100 (½–1 fruit)
Nectarines, mandarins, etc.	50–100 (½–1 fruit)	100 200 (1–2 fruits)
Soft fruit, plums, strawberries	50–70 (½–1 cup)	56–70
Stewed fruit: apples, rhubarb, gooseberries	50–100 (½–1 fruit)	56–100
Fruit salad	40–70	40–70
Fruit tinned in juice	55–65	70–115
Fruit juice	100 (ml)	100 (ml)
Dried fruit	15–20 (½–1 tablespoon)	28–42

Adapted from: Department for Education and Employment, 2000.

The WHO (2003) recommendation to reduce the intake of meat and animal products has given rise to concern about the possible risk of protein deficiency. This concern is unfounded, as protein recommendations – especially those agreed just after the Second World War – are now considered far too high; in some cases, nearly two to three times higher than current WHO recommendations. International recommendations now advise eating less meat than in the past, approximately 2 servings per day, (see table 5). Diets high in protein offer no benefits and can have a number of adverse effects. High circulating blood levels of amino acids may exceed the capacity of the liver and kidneys to metabolize and excrete excess nitrogen. This may lead to acidosis, diarrhoea and elevated levels of blood ammonia and urea. The high renal solute load associated with diets rich in protein reduces the margin of safety in maintaining water balance. High-protein diets are also associated with reduced kidney function (Knight et al., 2003; Goldfarb & Coe, 1999). Over time, individuals who consume very large amounts of animal protein risk permanent loss of kidney function. The kidney-damaging effect is seen only with animal protein. High protein intake is particularly dangerous for infants, as the kidneys are forced to excrete excessive solute loads. Excess protein intake in infancy could also be linked to the risk of developing obesity and high blood pressure later in life (Parizkova & Rolland-Cachera, 1997). Although protein deficiency is not a public health problem in the European region, iron deficiency anaemia remains prevalent (see step 3). The form of iron in legumes, including beans, peas and canned baked beans is not absorbed as easily as the one found in meat and fish. However, iron absorption can be maximised by consuming sprouting or fermented beans or alternatively, as discussed under step 3, eating beans along with a small amount of lean meat or fish. Serving liver, once per week is a relatively inexpensive, effective way of preventing iron deficiency anaemia. However, despite being a good source of iron liver is not always attractive choice to children. To prevent iron deficiency, foods fortified with iron may be a more

appropriate option, for example; breakfast cereals and bread. Care must be taken however regarding the added sugar and salt content of these items.

Table 5. Recommended number of daily servings and portion sizes: Meat, fish, poultry and alternatives

Meat, fish, poultry and alternatives (Example of one serving)	Age/portion size (grams)	
	3–6 years	7–18 years
Red meat (roasted): lamb, beef, pork and vegetarian meat substitute	40–50*	42–56*
Sausages	45–65	70–120
Liver	60	70
Cooked fish	50–70	90–160
Cooked dried peas, beans or lentils	200 ml (1 cup)	250 ml (1 cup)
Nuts or seeds	75 g–100 ml (1/2 cup)	125 ml (1/2 cup)

*Weight of meat can be reduced proportionately if adding another protein based food such as beans

Adapted from: Department for Education and Employment, 2000.

Depending on age, milk and milk-based products should be consumed between 2–4 times a day. Milk and products such as yogurt and cheese are valuable sources of calcium. In addition to dairy products, calcium can also be obtained from foods such as canned fish, which contain small bones that contribute calcium to the diet, and dark green leafy vegetables. Whole-grain or fortified cereals are also sources of small amounts of calcium. Calcium is particularly important for bone development during adolescence and reduced the risk of osteoporosis in adulthood.

Table 6. Recommended number of daily servings and portion sizes: Milk and milk products

Milk and milk products (Examples of one serving)	Age/portion size (grams)	
	3–6 years	7–18 years
Low-fat milk	100 ml (1/2 cup)	200 ml (1 cup)
Custard	40–50	84–98
Low-fat yoghurt	100 ml (1/2 cup)	175 ml (3/4 cup)
Cheese	20	45

Adapted from: Department for Education and Employment, 2000.

The consumption of excessive amounts of food products high in fat, salt and sugar should be minimised to ensure the risk of chronic disease and development of dental caries is minimised. Most children and adolescents like sweet tastes. The use of sugar in food preparation as a preservative, thickener and baking aid results in many processed foods containing “hidden sugars”. For example, one portion of sweet cake or pastry may contain around 30 grams of sugar and a 300 ml soft drink may contain roughly 40 grams, which translate to about 450 kJ (108 kcal) and 600 kJ (143 kcal), respectively. It is also important that soft drinks, i.e. soda, should not be excessively available at home or widely accessible to teenagers at schools (Kassem et al., 2003). The 2003 WHO Technical Report recommended that no more than 10% of daily energy come from sugar. This recommendation is easily exceeded if high-sugar products are consumed on a daily basis.

Sugar substitutes, such as saccharin and aspartame, are artificial sweeteners are also added to foods to help them taste sweet. Most sugar substitutes neither promote tooth decay nor provide energy, and may be useful in diabetic or low-energy diets. However, they do contribute to a “sweet tooth” or liking for foods containing sugar. Not all substitutes, however, are low in energy (such as sorbitol).

5.2 School meal provision: practical implementation

Children should be offered three meals and one or two snacks daily. Schools should therefore plan to provide each pupil with one and/or two meals (breakfast and/or lunch) and one snack per day. The meals should include items from the main food groups as shown in table 7.

Table 7: Meal guidance

Meal	Food group	Number of servings	Examples
Breakfast	Bread and cereals	1	Oat or wheat based cereal, toast, bread
	Fruit and vegetables	1	Fresh or dried fruit, fruit juice
	Milk and milk products	1	Milk, yoghurt
Lunch	Bread and cereals	2	Pasta, rice, potatoes
	Meat, fish, poultry and alternatives	1	Grilled fish, roasted meat
	Fruit and vegetables	2	Fruit or vegetables
Snack	Bread and cereals	1	Wholegrain crackers, sandwich
	Fruit	1	Banana, fruit
	Milk and milk products	1	Yogurt, milkshake

While the majority of schools only offer one meal, usually lunch, the importance of providing also breakfast should be stressed. Breakfast can be provided to those children able and willing to be at school before classroom work starts, in the form of breakfast clubs. This is often a suitable option for parents and care givers with children who work full time. Breakfast clubs increase social contacts between different age groups of pupils, raise awareness of the importance of a healthy breakfast and nutrition among children, teachers and parents, leads to collaboration with the community and maximises learning potential as well as improving the pupil's diets.

To ensure that the meals provided are nutritionally adequate, the nutrient content of menus should be calculated and the main meal should provide nutrient content as illustrated in table 8, with reference to the recommended average daily nutrient intakes (see Annex 1).

Table 8: Sample nutritional guidelines for school meals

Energy	30% of the estimated average requirement (EAR)
Fat	not more than 30% of food energy
Saturated fatty acids	not more than 10% of food energy
Carbohydrates	not less than 55% of food energy
Non-starch polysaccharides (fibre)	not less than 30% of the reference value
Protein	not less than 30% of the RNI
Iron	not less than 40% of the RNI
Calcium	not less than 35% of the RNI
Vitamin A (retinol equivalents)	not less than 30% of the RNI
Folate	not less than 40% of the RNI
Vitamin C	not less than 35% of the RNI

Source: Caroline Walker Trust (2001)

Through simple recipe alterations, e.g. baking instead of frying, using modern presentation techniques and providing training and resources to cooks and catering manager's school meals can provide healthy eating option for children. The following recommendation should be adhered to when preparing meals, both at schools and within the home environment.

Food purchasing

- Buy food that is clean and undamaged.
- Buy food from a reputable source where it is stored in a clean and safe manner.
- Read the labels on foods. The ingredients are listed by order of weight with the largest amount first. Check for added sugar and salt and select products with the lowest content.
- Note the "use by" or "best before" date. Do not buy food that you are not planning to use before the date shown.
- Keep perishable food items cold on the way home from shopping or check that the delivery truck does.
- Avoid unpasteurized milk and dairy products.
- If fresh is unavailable, choose frozen or canned fruit and vegetables.

Food storage

- Do not leave perishable food at room temperature for more than two hours. Perishable food brought from home, including sandwiches, should be kept in a refrigerator or cool place at a temperature below 5 °C.
- Once the food is opened, use it as a fresh food. The "use by" date applies to unopened food.
- Insulated cool boxes, or cool packs, should be used for carrying food when going on trips or outings.
- Cook leftovers as quickly as possible. Cover and when steam has evaporated put in the refrigerator. Avoid putting large quantities of warm food in the refrigerator as it raises the temperature.
- Cover foods in the refrigerator.
- Raw meat and raw fish should be stored on a lower refrigerator shelf to avoid dripping and contamination.
- Food stocks should be rotated and food beyond its use-by date should be discarded.
- Do not leave food in cans or packaging once opened; transfer to another container for storage.
- Do not refreeze foods.
- Wash the refrigerator frequently.

Kitchen hygiene

- Work surfaces should be cleaned with disinfectant after each meal preparation.
- Do not prepare food for children when ill.
- Cover cuts and sores with waterproof dressings.
- Uneaten food should be removed from the table and disposed of.

- Always wash hands with soap and water before preparing food, between handling raw and cooked foods, using the toilet, and before helping children to eat, and after changing diapers or blow their nose.
- It is also important that children and adolescents be taught essential rules of basic hygiene, as listed above.

Food preparation and presentation

- Separate chopping boards should be used for raw meat and fish, for cooked foods and for raw fruit and vegetables.
- Wash fruit and vegetables well and peel if necessary, i.e. root vegetables.
- Encourage the consumption of fruits and vegetables with edible skins as many vitamins and minerals are concentrated just below the skin.
- Discard the skins and cuttings from food preparation to prevent contamination of the prepared product.
- Do not leave food around the kitchen uncovered.
- Minimise the amount of fat, oil, salt and sugar added during preservation, preparation and cooking.
- Steam, grill, bake, boil or microwave food instead of frying.
- Steam fruit and vegetables or cook in small amounts of water to minimise nutritional losses.
- Meals should look appetising and be well presented using a variety of tastes and textures.

Reheating food

- If food is to be eaten warm, it should be re-heated until piping hot.
- Avoid keeping food hot for a long period.
- Stir foods, if possible, during reheating to ensure all parts are heated thoroughly.

Adapted from: Health Promotion Unit, Department of Health & Children (2004), American Dietetic Association, (2006).

The key persons involved in the provision of school meals are catering staff, parents and caregivers, teachers and members of the wider local community, i.e. farmers and retailers. Children and adolescents should also be involved in meal planning. Suggestions for involving these fundamental contributors in practical implementation of school food and nutrition policy are provided below.

Schools should be equipped with a kitchen and canteen. Catering staff are at the forefront of child nutrition and should therefore be equipped with the necessary skills to ensure children are supplied with healthy nutritious meals. Dietary guidelines need to be enforced and understood by all food service staff, especially given the difficulties that can arise with child food provision (see box 4). Improved communication with contract food providers will assist in the control and adherence to dietary guidelines. Training for catering managers should be provided to educate service staff about the holistic nature of diet, nutrition and lifestyle factors, i.e. exercise. The “On the Ball” programme in Germany has established quality criteria that include detailed training as a pre-requisite to certification. The scheme currently involved 370 institutions nationally, with over 1000 youth contact personnel trained each year in all aspects of diet and exercise management.

Box 4. Fussy eaters

Many children experiment with food and phases of refusal to eat certain foods or products served in a certain way are very common, especially in young children. Children often eat very little food at mealtimes as a way of showing independence. This should be recognised when developing guidelines for school meal services as it can act as a barrier to achieving dietary guidelines. If a child is refusing food the following implementations, applicable to both the home and school environment are suggested.

- Offer regular meals seated at a table with the television off.
- Prepare simple meals and encourage child involvement in preparation.
- Give small quantities and present them separately on the plate.
- Do not force the child to eat. Remove food when it is obvious that no more food will be eaten.
- Do not offer preferred alternatives or sweet foods.
- Praise the child if food is eaten and get others to do the same.
- Allow the child to eat with other well-eating children whenever possible.

Adapted from: Health Promotion Department, 2003.

Meals should be provided in a clean, bright supervised eating environment, with designated areas for age groups if necessary. Meals services should be operated in a way that queues are reduced. Cashless systems should be preferably operated, in order to simplify food distribution and avoid discrimination in case of subsidised schemes.

Meal options should be provided, but healthier options should be promoted. Initiatives that can be incorporated into school meal provision include:

- colour coded 'zone' menus – based on the food groups presented in the CINDI pyramid;
- food fayres and food themed days/weeks based on local/national traditions;
- recognition of national food days;
- regular events to promote particular products on the school menu;
- competitions and awards using a points based system i.e. leisure activity prizes for healthy food consumption;
- healthy meal deals;
- tasting sessions to encourage consumption of new food items/products; and
- pupil panels/committees to act as an interface with staff and pupils regarding food and nutrition based decisions.

Further good quality catering initiatives can be found in the 'Best in Class' online directory: a source of best practice interventions that have proved successful in a variety of settings.¹⁷

¹⁷ www.healthedtrust.com/indicates/exgoodprac.htm

Water consumption should be promoted as part of the school catering service. In addition, teachers are strongly encouraged to allow the consumption of water during their lessons instead of soft drinks. The intake of water by pupils in schools can be improved if:

- access to water is made easier, for example by installing water fountains or bottled water dispensers;
- drinking water is allowed during lessons; and
- pupils are made aware of the importance of an adequate fluid intake, especially during physical exercise.

Suitable eating areas should be available even if meals are not provided by the school and children bring meals from home. Parent's nutrition education is particularly important in this case and should be conducted, offering support and advice on healthy eating. All parents should be involved in the development of school food and nutrition policy, informed on the school's dietary guidelines and supported in the preparation of healthy food.

Providing parents with healthy cook books, created by the children, to enable the implementation of dietary recommendations at home in their family meals is one method of ensuring consistent messages and a community approach (Perez-Rodrigo et al., 2001). In Vienna, the implementation of a health promotion project at the Volksschule Rotzergasse primary school targeted overweight reduction and prevention. Parents were actively involved, with a conference where parents and teachers calculated their own Body Mass Index (BMI). Cooking classes were held educating parents about healthy eating and teaching them how to prepare healthier break-time snacks for their children (EDUHI, 2006). Other initiatives include inviting parents for special organised lunches and/or 'snack attack' sessions offering ideas for caregivers after school (see box 4).

In addition to basic school meals, food is provided to children through various means, i.e. vending machines and tuck shops. All stakeholders involved in the school community should be involved in the provision of food from these sources. Tuck shops in schools should offer a variety of healthy foods that should be adequately presented and promoted. Fruit tuck shops are a primary example of how all members of the wider school community can become involved in promoting child health and nutrition (see box 5).

Box 5. After school clubs

After school clubs are an important aspect of daily life for many children. Health promotion campaigns should therefore be aimed at all caregivers. Providing free information to caregivers and those managing after-school clubs ensures that healthy eating messages are consistent both within and outside the school setting. The 'Fit Kid' campaign created by the German Nutrition Society (DGE) provides a successful example, offering free information and consulting to after school clubs and day care centres.

Peer-led interventions that exemplify healthy eating behaviours can prove highly successful. Evidence suggests that peer-led education is at least as effective as adult-led education (Mellanby et al., 2000).

Pupils should be included in decisions regarding vending facilities in school. Pupils should be consulted on the location of vending machines, their reliability and the products they contain.

Suitable healthy vending products include milk, fruit, yogurt, salad pots, dried fruit, nuts, unsalted/unsweetened popcorn, and sandwiches. Products should be nutrient dense and satiating with low glycaemic index as these delay hunger (Higgs and Styles, 2006). In order for a healthy vending machine initiative to succeed, the following aspects should be considered (School Food Action!, 1996):

The pupils:

- What sort of healthier snacks would they like?
- When do they use the vending machines?
- What are their favourite items?
- How much money do they spend/ would they spend on vended products?

The vending machine suppliers:

- What do local suppliers offer?
- Are there specialist suppliers of healthier snacks?
- What is the cost?

Monitoring:

- How do sales patterns respond to changes?
- Do the healthier products sell well?
- If not, why not?
- Communicate the findings, changes, products and prices to pupils, parents and staff.

School snack bars should focus on the provision of healthy alternatives and should be organised through community collaboration (see box 6).

Box 6. Fruit tuck shops

Fruit tuck shops are small shops established by members of the school community (e.g. pupils, parents, local retailers or school staff). They sell fresh fruit, dried fruit and fruit juice. Fruit is supplied by local companies, delivered to the school on a regular basis. Fruit tuck shops are organised by pupils under the supervision of adults. In Wales and England fruit tuck shops programmes have become especially popular and many schools have taken part in an initiative promoted by the Food Standards Agency. Schools are encouraged to limit the sale of snacks high in fat, sugar and salt in an effort to increase fruit consumption and reduce the prevalence of dental caries. This has been successfully achieved in a school based initiative in Northern Ireland, "Boost Better Breaks" (Freeman et al., 2001).

Active children and adolescents, and those experiencing high rates of growth are likely to have increased energy requirements and therefore require snacks in-between meals. Healthy food items such as sandwiches and fruit should be readily available and promoted to children and adolescents as a substitute to products high in fat, sugar and salt from vending machines (see table 9). Restricted access to snacks between meals i.e. sweets, crisps and soft drinks (The Caroline Walker Trust, 2001) could prove beneficial, especially given the fact that processed snack products tend to be high in fat, salt and sugar. The Latvian Ministry of Health has been proactive in restricting the marketing of unhealthy products in educational institutions. Despite

negative reactions from the food industry, soft drinks, confectionary and products containing more than 1.25 grams of salt or 0.5 grams of sodium have been banned from being sold on school premises.

Box 7. Examples of pupil and parent focussed food provision

Pupils from the Bludenz-Obdorf primary school in Austria prepare a healthy breaktime snack for other children. Each class is responsible for the preparation of sandwiches, fruit and vegetable sticks once during the school year⁷. Snack bars also offer the opportunity for parents to become involved in the provision of healthy food, further contributing to community participation. Mothers of pupils at the Carl-von-Ossietzky-Gymnasium in Hamburg, Germany help in preparing healthy break-time snacks which are sold on a daily basis. Whole-meal bread sandwiches, fresh fruits and vegetables, unsweetened fruit juices and water are provided. To cater to the pupils' preference for sweet products, banana chips without added sugar are home-made granola bars are sold.

Table 9. Suggestions for healthy snacks

3–6 years old	7–18 years old
<ul style="list-style-type: none"> • Wheat based crackers with cheese spread, or low fat dips • Breakfast cereals (without added sugar) • Flavoured mini rice cakes or popcorn cakes • Breads of all kinds • Popcorn • Raw vegetable sticks e.g. carrots, celery, peppers, and cucumbers • Celery stuffed with cheese spread • Cherry tomatoes cut in small pieces • Steamed broccoli, green beans, or sugar peas with low fat dip • Apple rings • Chunks of fruit e.g. banana, pineapple or tangerine pieces • Canned fruits packed in juice • Fruit juice (with no added sugar) • Unsalted nuts • Milk shakes (made with fruit and milk) • Cheese slices with thin apple wedges • Fromage frais or yogurt • Hard boiled eggs 	<ul style="list-style-type: none"> • Any type of bread including: white, brown or wholemeal bread, fruit bread, crumpets, teacakes, muffins, fruit buns, malt loaf, bagels, pita bread, cheese scones, toast. • Sandwiches (also toasted) made with any type of bread. • Plain biscuits such as rich tea, oatcakes, breadsticks, cream crackers, matzos, rice waffles, melba toast, crisp bread • Home-made plain popcorn, home-made oven baked potato crisps or sweet potato crisps • Raw vegetables, e.g. carrots, celery, cucumbers, and peppers, served with dips i.e. soft cheese, humus, yoghurt and cucumber, taramasalata, avocado, salsa and olive paste • Fresh or dried fruit such as raisins, sultanas, apricots, dates and figs • Dairy foods such as yoghurts, cheese cubes, frozen yoghurt • Breakfast cereals (without added sugar)

Adapted from: Center for Nutrition Policy and Promotion, 1999.

5.3 Food supply

Local partnerships should form a key aspect of school food and nutrition policy. Local farmers should be encouraged to establish contracts with schools to provide healthy foods such as fruit, vegetables and dairy products via subscription schemes, and/or break-time snacks provision. Fruit and vegetable subscription schemes offer further means of ensuring pupils receive a daily intake of fruit and vegetables.

In addition to fruit and vegetable subscription schemes, milk programmes also provide an opportunity for improving child nutrition. By involving local farmers, these school milk programmes help to strengthen regional agriculture, sustain local jobs and reduce transport costs and pollution. Furthermore, they enable pupils and farmers to interact, and allow children to gain insight into the benefits of locally produced food.¹⁸ This example shows that school milk programmes can work on a small scale, and are not dependent on national-level initiatives.

Local retailers should also be encouraged to form part of the school community and recognise their impact on child health. Retailers should stock healthier snacks as alternatives to conventional products high in fat, sugar and salt. Examples for healthier options include:

- high-fibre, low-fat, low-sugar biscuits;
- whole-grain cereal bars;
- low-fat, low-salt snacks without flavour enhancers or preservatives and with natural food colouring;
- unsalted nuts and seeds;
- chocolate with high percentage of cocoa; and
- dried fruit without additional sugar.

Special offers should be aimed at making healthier options more economical for example, instead of offering a discount for a soft drink with crisps and chocolates, shops could offer a healthy drink and a sandwich. Local shops could also provide nutritional information to help the young consumers make the healthier choice.

Community awareness and collaboration with local schools can prove beneficial in improving the diets of children and raise awareness among families and community groups. Using health promotion and food as a focal aspect can act as a successful means of promoting healthy lifestyles in all age groups. A programme in Portugal, “Soup Land”, provides evidence of the improvements in community nutrition that can be achieved when despite including a variety of stakeholders, the scheme remains fundamentally child focussed. The programme developed around a traditional dish – vegetable soups – includes educational sessions to teach practical cookery skills to children, nutritional advice to parents, and a collaboratively produced booklet distributed to the local community.

¹⁸ http://hdra.org.uk/schools_organic_network/

5.4 Nutrition education and awareness

School curriculum should be modified and adapted to incorporate culturally appropriate nutrition education, which includes food preparation skills at all age levels.

Regardless of individual pace of learning, children should be encouraged and shown how to carry out simple tasks in order to learn basic skills. Children and adolescents should learn food skills according to their age and aptitude, with abilities developing as a child grows and matures. Food skills consist of basic knowledge in areas such as food hygiene, consumerism, food preparation and labelling. Basic food preparation skills are essential and contribute to the overall food skills. The ability to use kitchen equipment safely and easily aids the learning process and encourages experimentation with food and cooking. A guide to general skills appropriate to age is presented below in table 10.

Table 10. Guidelines for basic food skills for children and adolescents

Age (years)	Basic food skills/food preparation	Food purchasing
2	Wipe table tops, wash and scrub vegetables, play with utensils, select ingredients	
3	Wrap potatoes in foil for baking, knead and shape dough, pour liquids, mix ingredients, spread soft spreads, dispose of rubbish appropriately	
4	Peel fruits, form shapes i.e. bread dough, mash bananas using a fork, set and prepare table for eating	
5–6	Measure ingredients, cut soft vegetables, use an egg beater	
7	Understand basic hygiene concepts (i.e. hand washing, cleaning fresh fruits and vegetables before eating), setting tables, kitchen safety awareness (i.e. caution required with sharp utensils)	Recognise specific shops e.g. butcher or baker, food supply in shops
8–10	Prepare sandwiches and simple snacks, know simple techniques (i.e. boiling, frying), read and follow recipes, understand the need for hygiene, clean dish cloths, utensils etc, behave safely in food preparation areas	Purchase basic goods, handle money, identify different types of shops where food is sold, understand the environmental impact of packaging, be aware of food labels and basic information provided i.e. ‘best before’ or ‘use by’ date, be able to recognise an advertisement as a method of selling products
11–13	Experiment with different preparation techniques, use recipes, measure ingredients, apply food hygiene principles, use sharp utensils safely	Recognise the influence of advertising, ability to handle a shopping assignment (money and correct product), be able to identify the same food item in different packages, basic knowledge of the food chain, understand basic storage instructions included on food labels, ability to read ingredients list and highlight basic food groups

Age (years)	Basic food skills/food preparation	Food purchasing
14–18	Plan and prepare meals for themselves and others, apply different cooking techniques using appropriate equipment and skills, recognise and avoid critical hygiene points for cross-contamination, serve food, recognise eating as a social event, use a range of kitchen equipment safely, confidently and independently, respond appropriately to emergency situations.	Prepare shopping lists, establish food budgets for time periods, buy according to need, ability to compare prices and quality, recognise and understand nutrient values, ingredients and use of additives presented on food labels, understand the factors determining the quality of food, ability to understand and critique advertising techniques used in supermarkets, shops and by the mass media

Adapted from: Center for Nutrition Policy and Promotion, 1999; Dixey R et al., 1999.

One of the main issues essential to understanding the importance of a healthy diet is the ability to recognize food labels and translate the information provided into practical action. Information provided on food labels about nutrition can be difficult to understand. Children and adolescents should be encouraged to understand food labels, perhaps by reading the labels together and discussing them. Children should be encouraged to investigate the following food label information:

- name of the product
- price
- weight or volume of the contents
- use by/best before date
- ingredients
- nutritional information
- place of origin
- whether it contains genetically modified ingredients
- whether it contains artificial sweeteners.

Learning opportunities for healthy dietary practice inside and outside of the classroom setting are important. Local and national education authorities often provide a range of services to schools including information sheets to aid pupils to research subjects such as food miles and genetic modification.¹⁹ School gardens are a sustainable venture that has proved popular and successful in enabling children to learn about the origins of food. In many eastern European countries, cultivation, harvesting and preserving foods are still part of the school curriculum. This should be supported and promoted, with western schools learning from this example (WHO, 2001a). Food and nutrition policy must include aspects of curriculum monitoring and evaluation to allow continuous adjustment and improvement specific to the contextual needs of the pupils. In addition, concepts of healthy living and life-skills education should be extended to include broader health aspects i.e. alcohol consumption, drugs and disease prevention.

Creating partnerships and involving local farmers and retailers offer multiple benefits to both children and general understanding of food concepts. School trips to local farms enable children to learn first hand about food production and the food chain. Further, collaboration between

¹⁹ www.face-online.org.uk

primary and secondary school in close vicinities could provide an avenue for peer based education and healthy lifestyle promotion.

Generating media and publicity encourages community involvement and raises awareness of health promotion campaigns. One way of generating publicity is to encourage the local media to cover the school food and nutrition initiative with a press release sent to newspapers, radio and television. In addition, within the school and community special letters and regular newsletters may offer an important avenue of communication. Pupils should be involved in writing newsletters and be encouraged to contribute articles, recipes, poems or artwork. It is also important to promote the healthy food and nutrition recommendations and the project's achievements on the school website. A further way of communicating with parents and the local community would be to organize concerts, plays, exhibitions or fairs.

Health promotion messages and nutritional education should be positive and consistent throughout the school environment. Advertising and marketing (especially of branded products) should be minimised within the school setting. Focusing on healthy lifestyles and confronting any discrimination and stigmatization regarding food choices, body shape and size should be included in school policy and tackled with affirmative action.

Conclusion

Childhood and adolescence is an important period of development presenting a substantial opportunity for health promotion interventions, since many eating habits, lifestyle and behaviour patterns are established that persist throughout adulthood. From the outset adults influence child acceptance of certain foods and the development of healthy eating behaviour, and as children mature the influence of peer group pressure, school environment and media marketing on food preferences and eating habits becomes increasingly important.

The environment has been shown to be a fundamental factor in the development of healthy eating patterns and has proved crucial to the development of healthy nutrition habits in childhood. Through environmental modifications it is possible to make the healthier choice, the easier choice for children.

Schools provide a highly effective and efficient environmental setting for establishing healthy attitudes to food. The school context offers a great possibility to reach large numbers of the population, including young people and school staff as well as families and community members. Hence, health messages learnt in school can be maintained and pursued by children in at home and in their surroundings. Schools provide an ideal setting to improve eating behaviour, health and nutritional knowledge and boost the ability of children to make informed choices.

Schools provide the ideal setting for tackling the primary public health problems faced by European citizens. The structured development and implantation of a well planned food and nutrition policy focussed on the above criteria offers the best possible method of ensuring these issues do not escalate and hinder the livelihoods of future generations.

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Annex 1

Recommended Nutrient Intake for Children and Adolescents

Macro-nutrients

Age (years)	Gender	Energy ¹ (MJ/kcal)	Carbohydrate ² (g)	Protein ³ (g)	Fat ⁴ (g)	Saturated fat ⁵ (g)	Sugar ⁶ (g)	Fibre ⁷ (g)	Sodium/salt ⁸ (mg/g)
4–6	Boys	7.18/1715	228.7	19.7	66.7	21.0	50.3	13.7	598/1.6
	Girls	6.46/1545	206.0		60.1	18.9	45.3	12.4	
7–9	Boys	8.24/1970	262.7	28.3	76.6	24.1	57.8	15.8	1380/3.6
	Girls	7.28/1740	232.0		67.7	21.3	51	14.0	
10–13	Boys	9.3/2220	296.0	42.1	86.3	27.1	65.1	17.8	1380/3.6
	Girls	7.72/1845	246.0	41.2	71.8	22.6	54.1	14.8	
14–18	Boys	11.5/2755	367.3	55.2	107.1	33.7	80.8	22.1	1600/4.0
	Girls	8.83/2110	281.3	45.0	82.1	25.8	61.9	16.9	

N.B. No absolute requirement exists for sugar or fats (except essential fatty acids), the values presented represent a maximum

Micro-nutrients

Age (years)	Gender	Iron ⁹ (mg)	Folate ¹⁰ (µg)	Calcium ¹¹ (mg)	Vitamin A ¹² (µg)	Vitamin C ¹³ (µg)	Zinc ¹⁴ (mg)
4–6	Boys	6.1	200	600	500	30	6.5
	Girls						
7–9	Boys	8.7	300	700	500	30	7.0
	Girls						
10–13	Boys	11.3	400	1300	600	35	9.0
	Girls	14.8					
14–18	Boys	11.3	400	1300	700	40	9.5
	Girls	14.8			600		7.0

Source: FAO/WHO recommendations in Prentice et al., 2004; British Nutrition Foundation, [http://www.nutrition.org.uk/upload/Table%202\(3\).doc](http://www.nutrition.org.uk/upload/Table%202(3).doc)

¹ Estimated Average Requirement (EAR): according to COMA Report (1991)

² Dietary Reference Value (DRV): average 50% of food energy

³ Reference Nutrient Intake (RNI) according to COMA Report (1991)

⁴ Dietary Reference Value (DRV): average 35% of food energy

⁵ Dietary Reference Value (DRV): average 11% of food energy

⁶ Dietary Reference Value (DRV): average 11% of food energy

⁷ The Dietary Reference Value (DRV) for adults is 18g – children should eat proportionately less. The values presented are calculated as a percentage of the energy recommendation – 8g per 1000 kcals.

⁸ Scientific Advisory Committee on Nutrition (SACN) recommendations

⁹ Reference Nutrient Intake (RNI) according to COMA Report (1991)

¹⁰ Reference Nutrient Intake (RNI) according to FAO/WHO recommendations in Prentice et al., 2004

¹¹ Reference Nutrient Intake (RNI) according to FAO/WHO recommendations in Prentice et al., 2004

¹² Reference Nutrient Intake (RNI) according to COMA Report (1991)

¹³ Reference Nutrient Intake (RNI) according to COMA Report (1991)

¹⁴ Reference Nutrient Intake (RNI) according to COMA Report (1991)

Annex 2

NUTRITION EDUCATION MATERIAL FROM EUROPEAN COUNTRIES

AUSTRIA	http://www.give.or.at
BELGIUM	http://www.vig.be (Flemish Health Promotion Institute)
DENMARK	www.dpb.dpu.dk (Danmarks Pædagogiske Universitet)
GERMANY	All ages:
	http://www.bildungserver.de/ (enter Ernährung and Schule)
	http://www.learn-line.nrw.de/angebote/gesundids/medio/praxis/in_ern.html
	http://www.bzga.de/ (Federal Centre for Health Education)
	Primary Schools:
	http://www.erlebniskiste.de/
	http://www.gesund-macht-schule.de/
	Consumer Education
	http://www.lernerfolg.vzbv.de/
12–18 year olds	
	http://www.talkingfood.de
SPAIN	<i>Nutrición saludable y prevención de los trastornos alimentarios.</i> Ministerio de Sanidad y Consumo; Ministerio de Educación, cultura y Deporte; Ministerio del Interior, ISBN: 84-369-3292-7
UNITED KINGDOM	Getting to Grips with Grub http://www.seafoodtraining.org/grubgrips.pdf
	SUSTAIN – The alliance for better food and farming, including Grab 5! http://www.sustainweb.org
	Educational resources on nutrition and organic agriculture http://www.soilassociation.org .
	Educational pack for teachers and facilitators on public relations in the global economy and marketing for secondary schools; covers global citizenship, social education, business studies, geography and media studies. <i>Seeing through the spin</i> , Baby Milk Action, 2001. ISBN: 0-9540228-07
	Eat your words. Understanding healthy eating and food messages for 7–11 year olds, National Heart Forum, 1996. ISBN: 1 874279 07 1
	<i>Home economics standard grade course notes</i> , Leckie & Leckie Ltd., 2002. ISBN: 1-84372-034-5

Internet-based nutrition education targeted at pupils:

European homepage (English, French, German, Spanish, Italian)

Games and information for children (Kidz), adolescents (Adoz), schools and parents

<http://www.coolfoodplanet.org/>

5–7 years: <http://www.welltown.gov.uk/school/dining.html>

7–11 years: <http://www.galaxy-h.gov.uk/school-menu.html>

11–14 years: http://www.lifebytes.gov.uk/eating/eat_menu.html

14–16 years: <http://www.mindbodysoul.gov.uk/eating/eatmenu.htm>

WHO

International Planning Committee (IPC): WHO, European Commission, Council of Europe
Healthy eating for young people in Europe; a school based nutrition education guide, 1999.
ISBN: 92-890-1170 X

Annex 3

USEFUL INTERNET LINKS

Wired for Health: www.wiredforhealth.gov.uk

The Wired for Health web site provides a comprehensive guide to all aspects of health in the context of the National Curriculum and the National Healthy School Standard.

Kent Healthy Schools: www.kenthealthyschools.org

The Kent Healthy Schools web site contains useful information for pupils, parents and teachers as well as key contacts and useful web sites.

British Nutrition Foundation: www.nutrition.org.uk

Resources for schools are discussed in the education section of the site, with guidance on food and nutrition for primary teacher training. Most support is from the food industry.

Food Standards Agency: www.foodstandards.gov.uk/healthiereating

An independent food safety watchdog set up by an Act of Parliament in 2000 to protect the public's health and consumer interests in relation to food. Diet and health web pages include a number of initiatives related to healthier eating in schools. A new survey revealed that 90% of children's school lunchboxes contain food that is too high in saturated fat, salt and sugar: www.foodstandards.gov.uk/news/newsarchive/school_lunchboxes.

Sustain: www.sustainweb.org/child_index.asp

A charity representing 100+ national public interest organizations working toward better food and farming. It produces a wide range of publications and has a very informative web site. See in particular the campaign for the children's food bill.

Grab 5!: www.sustainweb.org/grab5_index.asp, www.sustainweb.org/grab5:pr:ukfp.asp.

Includes an excellent summary of food in schools and a project, led by Sustain, to encourage primary school pupils to eat more fruit and vegetables.

Health Education Trust: www.healthedtrust.com

A UK registered charity, formed to promote the development of health education for young people. It has carried out extensive work to promote healthier eating in schools, including pioneering school nutrition action groups and setting up a database for school catering.

Fruit tuck shops in primary schools: www.food.gov.uk/multimedia/pdfs/fruittuckwales

A practical guide to planning and running a school fruit tuck shop based on research carried out by the University of Bristol and the Health Promotion Division of the National Assembly for Wales.

Food Dudes: www.fooddudes.co.uk/

A research based initiative developed by the University of Bangor to promote the consumption of fruit and vegetables through providing fruits, vegetables and videos and utilizing peer influence and rewards.

Other websites to support healthy eating for school children:

www.coolfood.co.uk provides information about healthy eating for primary school children.

www.food.poverty.hea.org.uk provides access to a food and low income database.

www.dietsure.com helps with dietary analysis.

www.schoolsorganic.net has information about an organic gardening project that works with schools.

www.dfes.gov.uk/schoollunches gives nutritional standards for school lunches.

www.comicompany.co.uk has teaching resources on food, and lots more.

<http://www.stonyfield.com/> -company offering healthy solutions for schools

National school fruit scheme: available on the 5 a day web site.

www.dh.gov.uk/policyandguidance/healthandsocialcaretopics/fiveaday/fs/en

Free fruit initiative (Scotland): www.scotland.gov.uk/about/ed/PSI/00018922/fruit.aspx.

<http://www.smilechild.co.uk/magazine/generator.asp?article=50>: The Green Machine stocks only natural products

<http://www.talkingfood.de>: how to set up or improve school break-time shops

Information on healthy vending:

http://www.nacsonline.com/NACS/News/Daily_News_Archives/October2003/nd1027036.htm

School subscription programmes:

EPBH European Partnership for Fruits, Vegetables and Better Health: <http://www.epbh.org>

Netherlands -School Fruit Programme [Dutch]: <http://www.schoolgruiten.nl>

Norway – School Fruit Programme [Norwegian]: <http://www.skolefrukt.no>

United Kingdom – School Fruit Programme:

http://www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/FiveADay/FiveADayGeneralInformation/FiveADayGeneralArticle/fs/en?CONTENT_ID=4002149&chk=DeYbs5

FAO School Milk Programme:

http://www.fao.org/es/ESC/en/20953/20999/highlight_25253en.html

United Kingdom – School Milk: <http://www.schoolmilk.co.uk>;

<http://www.milkforschools.org.uk/>