Nutrition Education in Primary Schools

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INTRODUCTION

A THE BACKGROUND

Nutrition, health and education – three essential pillars of development

Many different types of interventions are commonly quoted when discussing how the lives of people in developing countries can be improved. Typically, these are measures in the area of infrastructure, production methods, policies (regarding trade, agriculture, etc.), environment, and so on. Nutrition education is hardly ever included in such a list. The authors of this book, however, and looking at the basis of prospering societies, believe that nutrition education, particularly in schools, can indeed contribute significantly to sustainable development in poor countries.

Among the many pillars that form the basis of a thriving nation, three are particularly important: nutrition, health and education (Figure 1). School-based nutrition education – properly done - touches upon all of them.

Figure 1 Three essential pillars of development

It almost goes without saying that *health* is important to development – without it, a country and its population cannot function properly. We need only consider for a moment the devastating social and economic consequences of AIDS in Africa to recognize this obvious fact.

Good *nutrition* is another pillar of development, and not only because food is the most basic human need. Without proper nutrition, health is impossible. The amount and kinds of foods people eat, and their nutritional quality and safety, have direct effects on people's health and well-being, and hence on their ability to act to improve their own lives.

Education, too is essential for development. It creates choices and opportunities for people, reduces the twin burdens of poverty and disease, and gives a stronger voice to individuals in society. For nations, education creates a dynamic workforce and well-informed citizens who are able to compete and cooperate globally – opening doors to economic and social prosperity.

None of these three factors alone, however, will suffice to achieve social and economic development; only in combination will they enable progress towards a world without poverty and hunger.

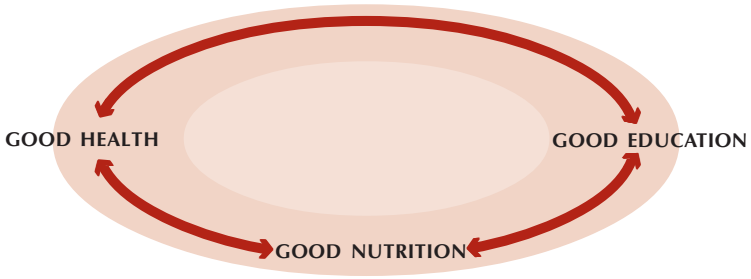
Addressing them in combination is also most advisable because all three factors are closely interlinked, and even dependent on each other. The positive effects of one factor can be achieved only if accompanied by the other factors. Without proper health, for instance, good education is not possible; and without proper education, health suffers.

Likewise, nutrition and education are closely interlinked. It is commonly understood that good nutrition during childhood is important for healthy growth and development. But in addition to affecting physical growth and maturation, a child's nutritional status also influences a number of factors that are central to the child's educational achievements – good health and nutrition increase the child's attention span, its learning capacity, and its ability to fully engage in educational experiences. Studies have shown that good health and nutritional status also enhance school enrolment, attendance and retention.

This mutually reinforcing relationship between nutrition, health and education is shown in Figure 2: Good nutrition is the basis for good health, and both help in making education effective; good education – particularly among women in the developing world – is often found to be the single most important factor in determining a child's health and nutritional status.

■ ACTIVITY 1 *Nutrition, health and education*

FIGURE 2 The relationship between nutrition, health and education



WHY IS NUTRITION EDUCATION IMPORTANT?

Given the important role of nutrition, health and education for an active society, as described above, interventions that address these factors not only are urgent but they also have the potential to make a major contribution to a country's overall economic and social development. Nutrition education is such an intervention. It provides people with the knowledge, skills and motivation to make wise dietary and lifestyle choices, building thus a strong basis for a healthy and active life.

There are two main types of chronic nutritional problems that are found at either ends of the spectrum of malnutrition: those due to insufficient intake of good quality and safe foods, and those due to an excessive or unbalanced intake of food or certain types of food. Both can be prevented or reduced with an adequate or proper diet.

Whether food supplies are scarce or abundant, it is essential that people know how best to use their resources to access a variety of safe and good quality foods; to ensure nutritional wellbeing. To be food secure and adequately nourished, households need sufficient resources to produce and/or purchase adequate food. In addition, they need the understanding of what constitutes an appropriate diet for health, as well as the skills and motivation to make sound choices on family care and feeding practices.

Food and nutrition education thus play a vital role in promoting food security, as it is especially important for poor households to make optimal use of local foods and practice healthy eating patterns. Effective nutrition education is also important for combating the rise in non-communicable, diet-related diseases seen in many countries.

WHY NUTRITION EDUCATION MATTERS IN DEVELOPING COUNTRIES

Given the many pressing economic and environmental problems which developing countries face, nutrition education may seem to be of secondary importance there. The reality in these countries actually suggests the contrary, for many reasons:

- *High rates of under-nutrition and nutritional deficiencies* (Vitamin A, iodine, iron deficiency anaemia and so on) require urgent intervention.
- *Diet-related chronic diseases, including excess weight and obesity, are increasing in* developing countries as well as in the developed world. Developing countries will find it particularly difficult to shoulder the double burden of diseases due to undernutrition and those of dietary excess and imbalance.
- *Economic and human development requires healthy people.*
- *High population growth rates affect the entire food system of a country*, hence people need to learn about and adjust to new developments in the system.
- *There is greater migration from rural communities to urban environments*, where people depend entirely on the commercial food supply. New arrivals therefore need new skills to choose nutritious diets.
- *Economic development and globalization introduce new foods and alter dietary habits and lifestyle patterns*, rendering traditional knowledge and skills insufficient and inappropriate. New knowledge and new skills are needed to choose healthy diets consistent with nutritional needs.

Pictures can often explain a complex issue better than many words. The graphic below, drawing from a photo[1] taken in Namibia, illustrates strikingly why nutrition education is important in developing countries.

Here we see the meeting of two worlds – a mother from a traditional world pushing a trolley in a supermarket that is typical of the modern industrialized world.

[1] © STERN, Gruner + Jahr Verlag, Hamburg, Germany, 1999

We can make out some "modern" food items in her trolley: white bread and canned beer. Noticing these, we may ask ourselves how well this mother is handling her role as the food provider and caregiver for her family, especially if she has limited financial means? Will her traditional knowledge and skills as regards food and eating be enough to guide her to make healthy and economically-sound decisions?

Without a doubt, if she has received a *good nutrition education*, she is more likely to be able to provide for the nutritional well-being of her family in all the changing circumstances of her world.

With such an education she will no longer be part of the problem of nutrition and health in her country, but part of the solution – for herself, her children and her community. She will be an active participant in creating health, not just the recipient of health care.

WHY WORK THROUGH SCHOOLS?

Schools are the natural development zone for nutrition education. They are one of the main social contexts in which lifestyles are developed. Children of school-going age develop behaviour through interaction with other pupils, teachers, parents, siblings and peer groups. They are influenced by their homes, their communities, the mass media – and the school. Thus the school is part of a network of influences which shape eating patterns and attitudes.

Schools are also ideal settings for promoting healthy eating, for many other reasons:

- *They reach most children*, for a number of years, on a regular basis.
- *They have a mandate* to guide young people towards maturity. Given the vital role of nutrition in a healthy fulfilled life, nutrition education is part of this responsibility.
- *They have qualified personnel* to teach and guide.
- *They reach children at a critical age* when eating habits and attitudes are being established.
- *They provide opportunities to practise healthy eating and food safety* in school feeding programmes, and through the sale of food on their premises.
- *They can establish school policies and practices* – for example, sanitation facilities, rules about handwashing – that can improve health and nutrition.
- *They spread the effect* by involving families in their children's nutrition education.
- *They can be a channel for community participation*, for example via school garden projects or school canteens, or through local intersectoral committees.
- *They can provide cost-effective nutrition interventions* (other than education).

Primary schools are particularly suitable vehicles for nutrition education. They catch children younger, when their habits are still being formed. They reach a larger proportion of the population – in particular girls, who tend to leave school earlier. Moreover, nutrition lessons are simple, interesting, colourful and easily learned by demonstration, illustration, example and practical action – approaches which are natural to primary education.

Nutrition interventions and nutrition education – schools have many different possibilities to work towards improved nutrition

Nutrition education in schools may be the first and only example that springs to mind, but schools also have many other means of contributing to good nutrition and health. We call the full range of such interventions *school-based nutrition interventions*. These include all policies, services, learning experiences and other actions implemented by schools, individuals or groups which make healthy nutrition a way of daily life, both at present and in the future (see Table 1).

Table 1 School-based nutrition interventions

School Food Services	School Nutrition Policy	Health Promotion for Staff
Feeding Programmes	Nutrition Education (Classroom)	School Health Services
School Gardens	Healthy School Environment	Counselling and Social Support Programmes
etc	Exercise, Recreation, Sport	School Community Projects and Outreach

Traditionally, mainly physical and medical interventions have been put in place with a view to tackling the immediate effects of poor nutrition in schoolchildren – for example, school meals and snacks, deworming, food supplements, checks by the school health service, improved sanitation and water supply. These are important and have undoubtedly achieved a great deal. But schools can do much more than this to contribute to good nutrition. One of the most enduring, effective and economic interventions has until now been relatively neglected. It is also one in which schools have the biggest role to play. This is *nutrition education*.

Health promotion – an important innovation in health care, and for nutrition education as well

Notwithstanding what has been said above about the important role which nutrition education can play in achieving nutritional well-being and health, *traditional* nutrition education, however, has proven to be too narrow a strategy, since it addresses only individual lifestyles and cognizance. Increased effectiveness is crucial if nutrition education is to become a true ally in a country's fight against hunger, malnutrition, poverty and underdevelopment. This increased effectiveness is only possible with a holistic approach, based on the principles of health promotion.

Health promotion starts from the conviction that "health is created and lived by people within the settings of their everyday life; where they learn, work, play and love" (Ottawa Charter for Health Promotion. 1986). Health promotion therefore has a wider objective than traditional

health care: *creating* health is considered just as important as *preventing* health problems. In addition, people themselves are seen as active participants in creating health, not just as recipients of health care. Health promotion, therefore, explicitly goes beyond traditional health care programmes and health education programmes by adding five essential interrelated actions:

- building healthy public policy;
- creating supportive environments;
- strengthening community action;
- developing personal skills;
- reorienting health services.

The concepts of health promotion can be applied in nutrition education – and the poor results of traditional nutrition education actually strongly suggest doing so. Applied to nutrition, a *promotion* approach means to aim at preventing nutritional disorders, while at the same time:

- creating nutritional well-being by developing conditions and environments that are conducive to nutritional health;
- involving people themselves as active partners;
- developing their skills to make healthy choices.

EFFECTIVE NUTRITION EDUCATION IN SCHOOLS REQUIRES AN EXTENDED CURRICULUM – BASED ON THE PRINCIPLES OF HEALTH PROMOTION

Schools are a particularly suitable setting for practising nutrition education in a *promotion* style. All school-based activities related to healthy eating – not only those taking place in the classroom – can be seen as part of an extended nutrition education curriculum, a sort of "macro-curriculum", which puts a health promotion approach into productive action.

Outside the classroom, nutrition and food programmes, school policy and school rules (for example) are the most direct and obvious means of promoting good nutrition. The added value of the health promotion approach is that these are integrated into an overall goal of healthy nutrition, and that the players are actively aware and involved. This is what makes them *educational* actions[2] - the school environment becomes as a source of learning, to complement the classroom curriculum.

The family and community represent another dimension of the macro-curriculum. Their involvement is particularly vital in nutrition education, where the school is not the only source (and perhaps not even the main source) of what children learn. Eating habits, practices and attitudes are learned primarily in the family, and reinforced by the community, the media

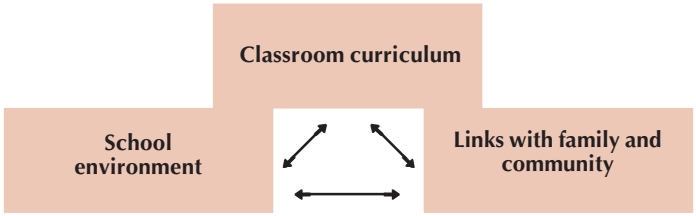
[2] To take an example: making children wash their hands before eating is good old-fashioned hygiene. But when children learn about washing hands in class, discuss the school rules for handwashing and explain them to visitors, are responsible for the soap supply, train smaller children, check out handwashing facilities in other places, and ask parents why handwashing matters, then handwashing has become part of the nutrition education curriculum in the broadest sense.

and the child's experience of the physical environment. In no other school subject is there such a constant flow of learning from other sources. School nutrition education must therefore work with and through the other contexts in which nutrition is being learned. This means that schools will need to enter into dialogue with families, collaborate with them, and accept that their own role is to explore and find out, as much as it is to teach and instruct. It will be important to make positive links with families and with other sectors, organizations and individuals concerned with food and nutrition in the community.

Food and eating habits are conditioned by the local situation – local agriculture, local cuisine, the local economy, local beliefs. Although nutrition education has a common core of knowledge and skills, each locality has different resources, problems and solutions, and needs to add its own specific content to the core, creating a different curriculum for every area. This is why the physical and social environment – where food is grown, processed, cooked, sold, eaten and disposed of – is a living textbook, and must be utilized by schools at least as much as published teaching materials.

All these features of the extended curriculum – events in the school environment, relationships with the family and community, outreach activities – will affect nutrition education in the classroom itself and must therefore be considered integral parts of school-based nutrition education. Effective school-based nutrition education requires a health promotion approach and a "tripartite curriculum" (Figure 3).

Figure 3 The tripartite curriculum of school-based nutrition education



Classroom approaches will also be conditioned by the fact that nutrition education, like health education, is concerned with behaviour and attitudes as well as with understanding. This requires far more self-engagement than with other subjects.

Children will need to experience, to observe, to experiment, to discuss, to hear from others – above all, to be actively involved in interpreting experience and making choices.

Thus the concept of health promotion, and the nature of nutritional learning itself, both determine what is to be learned, how it is learned and where.

For schools, this may mean many sorts of adaptation:

- establishing good working relationships with family and community;
- engaging more with their local environment and its food practices;

- shaping classroom content to the local situation;
- organizing field trips, events and projects;
- developing school policies;
- adapting classroom approaches and materials.

For education authorities and ministries, reforming the nutrition education curriculum will mean a broad multisectoral and multi-level approach on several fronts, including:

- curriculum development;
- teacher training;
- materials production;
- other help and support for schools.

School curricula are generally overcrowded and dominated by exams. What nutrition education there is (and sometimes there is almost none) is often limited and covered only briefly in the home economics syllabus. However, room must be made for nutrition education in its own right. Healthy eating is at the heart of a healthy society, and school-based nutrition education can make a vital contribution to healthy eating.

CONCLUSION

Good nutrition education – particularly if it is delivered in the way this Guide suggests – helps children to become "nutritionally literate". Children educated in this way will come to know, for example, how to achieve a good diet with limited means, what food is nutritionally valuable, where to find it, how to prepare food safely and make it appetizing, and how to avoid food dangers. In other words, how to make good food- and lifestyle-choices and develop good eating habits for themselves and for others (for example, the old or sick).

If they are in an agricultural community they will have good ideas (old and new) about what to plant and how to cultivate it, harvest it and preserve it. In urban areas they will know where to shop, which food outlets are unhygienic and how to give a considered reaction to alluring advertising. All will know the vital importance of clean safe water for drinking and washing.

When they become parents, they will be aware of the nutritional risks run by pregnant women and babies, know about breastfeeding and complementary feeding, and be able to establish good eating and hygiene habits in their own children. Nutritionally-literate adults will know where to get answers to questions about food and diet, will respect dietary cultures but know how to vary and extend them, will challenge dangerous food myths, and will have the educational background to understand community policy, intervene in debate and promote action for health.

In short, the value of nutrition education to the long-term development of a society is plain to see.

B THE PLANNING GUIDE

▪ ACTIVITY *2* *The Planning Guide*

What the Guide is

Nutrition education in primary schools can be a strong ally in a country's efforts to overcome hunger and poverty. To support these efforts, the FAO Food and Nutrition Division, in collaboration with other international and professional organizations, develops and promotes innovative strategies and materials that assist countries in planning and implementing school-based nutrition education.

This Planning Guide is one such initiative. It attempts to help countries give nutrition the educational attention it deserves. It is *not* a training course in nutrition.[3] It is the manual for a planning exercise which aims at establishing effective nutrition education programmes in schools.

Whilst we continue to use the traditional term "nutrition education", the learning promoted in the Planning Guide differs from traditional nutrition education in several ways. In fact, planning nutrition education with this Guide adds value to a standard curriculum development process because of the special features promoted by the Planning Guide. The most important of these are:

- *The tripartite curriculum* Building on the holistic principles of health promotion, the Guide recognizes that eating habits are not learned only in class but also in the home, the community and the environment. Hence, classroom learning is only one element of the nutrition education this Guide aims to develop or improve. The Planning Guide strongly recommends looking beyond the classroom boundaries and applying a comprehensive "tripartite curriculum" (see Figure 2) which aims at reinforcing classroom learning by creating a dialogue with families and the community, and making the school environment conducive to healthy nutrition.[4]
- *A wide idea of learning* – The Planning Guide takes a wide view of nutrition education as something that establishes and reinforces good dietary and lifestyle practices. It therefore aims at changed behaviour, attitudes and lifeskills, as well as knowledge. It also applies a teaching approach that is allied to the nature of the learning involved.
- *A cross-sectoral approach* – The Guide recognizes that children's nutrition and nutrition education can benefit from the expertise, support and commitment of sectors other than education – for example, agriculture, health and community services – and that those sectors should therefore be involved from the outset in planning nutrition education.

[3] The Planning Guide gives just enough basic technical information about nutrition to enable educators to plan the curriculum – see the two Preparatory Units. It does not attempt to provide comprehensive training in nutrition. If there is a need for further information or training, nutritionists or health experts should be consulted.

[4] The term "curriculum" is used accordingly throughout the Guide; that is, unless explicitly specified as "classroom curriculum", curriculum always refers to the full programme of nutrition-relevant activities, comprising also those dealing with the whole school, the parents and the community.

- *An emphasis on local environment and local issues* – The Planning Guide highlights and deals with local dietary needs, looking at available foods and local food practices.

Because of all these features, this type of nutrition education programme promises to be more effective than traditional nutrition education.

The Guide is suitable for any school or education system, but it fits particularly well into WHO's Global School Health Initiative, and complements Document Four of the WHO Information Series on School Health[5] by developing the area of nutrition education more fully. It emphasizes food and nutrition as central to health promotion (thus balancing approaches to health promotion which focus on medical intervention and nutrient supplementation), by explaining why food and nutrition is important in health promotion, and by showing how food and nutrition activities can strengthen health promotion activities in schools.

THE PURPOSE OF THE GUIDE

The purpose of the Planning Guide is to help plan or redesign nutrition education action programmes and produce classroom curricula for nutrition education in primary schools. Its goals are the improvement of the health and nutrition status of schoolchildren, and the establishment of lifelong healthy eating habits and lifestyles among the school population (see Unit A1 for the goals and objectives of nutrition education).

Using the Guide results in action plans that are in line with the wider vision of the "tripartite nutrition education curriculum", described above. Outcomes may include:

- analyses of dietary needs and food resources;
- policies and mission statements;
- a new classroom curriculum;
- strategies for involving families and community;
- plans for the school environment;
- proposals for teacher education.

These action programmes may be planned and carried out at either local or national level, or both, and will be adapted to local, regional or national circumstances and resources (see *Users and uses* below).

[5] WHO/FAO. 1998. *Healthy nutrition: An essential element of a health-promoting school.* WHO Information Series on School Health. Geneva.

OUTLINE AND MATERIALS

Outline

The Planning Guide is designed to assist a variety of users in completing all the steps necessary when planning nutrition education programmes. Table 2 shows the various curriculum planning phases and the corresponding parts of the Planning Guide.

For users who need briefing on basic facts about food and nutrition, the Guide provides PREPARATORY UNITS 1 and 2, to be covered before the main planning process.

The core of the curriculum planning process in the Guide is:

- establishing and agreeing on basic concepts – PHASE A: CONCEPTS and PRINCIPLES;
- analysing the situation and agreeing on priorities – PHASE B: SITUATION ANALYSIS;
- planning action for the school environment and the classroom – PHASE C: ACTION PLANS.

To carry out the situation analysis in Phase B, information is gathered about such factors as:

- children's diet;
- health interventions;
- school health programmes;
- relations with family and community;
- the condition of the school environment;
- the current content of the classroom curriculum;
- the prevailing teaching approach.

Much of this information is contributed by workshop participants, but it is backed by information gathered using QUESTIONNAIRES circulated *before* Phase B begins. This information is recorded on DATA SHEETS.

There are therefore five phases, as shown in Table 2. Phase A deals with three main themes: health/health provision, then curriculum in all its aspects (family and community, school environment, classroom) and finally classroom practice (methodology, classroom resources). These themes are revisited in Phase B for the situation analysis. All the themes come together to contribute to the action plans in Phase C. The decisions reached in each unit are recorded on DISPLAY DOCUMENTS, which build up, step by step, a complete picture of the working group's conclusions.

TABLE 2 Curriculum planning phases and corresponding parts of the Planning Guide

Curriculum planning phases	Purpose	Parts of the Planning Guide
Support and preparation (before or during Phase A)		
Preparatory phase	• providing basic facts about food and nutrition • establishing and agreeing ideas of good and bad nutrition	Preparatory Unit 1: A good diet Preparatory Unit 2: Malnutrition and its causes
Assessment phase	• data-gathering for the situation analysis	Questionnaires and Data sheets
Main planning process		
PHASE A: **Concept and principals**	• establishing (agreeing) concepts of nutrition education • agreeing on appropriate teaching approaches for nutrition education	A1 Health and healthy lifestyle A2 A good nutrition education curriculum (1): The tripartite approach *(family, community, school environment)* A3 A good nutrition education curriculum (2): The classroom curriculum The Classroom Curriculum Chart *An example for content and adaptation* A4 Learning approaches to nutrition education
PHASE B: **Situation analysis**	• describing the present situation • identifying priority needs (using data gathered in the assessment phase)	B1 Local health, diet and food What are the dietary needs? B2 Health and nutrition interventions What is being done? B3 Family and community Who can help and how? B4 School environment How healthy is the school? B5 Classroom curriculum What are children learning? The Classroom Curriculum Chart Is our curriculum adequate, relevant and well distributed across the age range? B6 Classroom approaches What is needed in the *classroom?*
PHASE C: **Action programme**	• establishing priorities and strategies • drawing up action plans	C1 Priorities and strategies *What comes first?* C2 Programme for school environment *How will we make the school healthy?* C3 Classroom programme *What should children learn in class?*

MATERIALS

The Planning Guide consists of two books containing directly-related material. This material is divided into two Volumes for practical reasons:

- *The Reader* explains the ideas and processes involved in developing nutrition education in primary schools. Related worksheet activities are indicated in the text like this:
  - ACTIVITY 1 – *Title of activity*
- *The Activities* take participants through the planning exercise. Most of these exercises are essential to the planning process.

The following working materials in the Planning Guide provide additional inputs to the planning process and aid the recording of important planning steps:

- *Display Documents*, where the results of the activities are recorded and upon which decisions are later built.
- *The Classroom Curriculum Chart,* a poster representing classroom learning objectives.
- A set of *Questionnaires* (for teachers, parents, health experts and so on) to gather data for the situation analysis in Phase B. The questionnaires are to be completed before the workshop or during Phase A.
- The *Data Sheets* summarize the questionnaire findings for each group.
- *Notes for Facilitators and Workshop Organizers* (part of *The Activities*) explain how to organize a workshop and handle the workshop activities.

An illustration of how the individual materials of the Planning Guide are meant to be used in arriving at a nutrition education work programme is given in Figure 1 in the "Notes for Facilitators and Workshop Organizers" in the Activities Volume.

USERS AND USES

The Planning Guide is aimed at any or all professionals in a country, region, district or school who are involved with planning nutrition education programmes for primary schools. These primary users include:

- ministry officials;
- education inspectors and advisers;
- head teachers and teachers;
- nutrition experts;
- health professionals;
- education counsellors;
- writers and teacher educators.

They divide into two main groups:

- *national level users*, who are primarily from centralized educational institutions;
- *local level users*, who are more closely linked to particular schools or groups of schools.

Consultants and stakeholders

To get the most out of the Guide and out of workshops, other experts and professionals should be called on to give advice, information and opinions, and to be involved in the planning process. These may include representatives from:

- NGOs;
- aid agencies
- community services;
- the Ministry of Agriculture;
- the Ministry of Health;
- school feeding schemes;
- PTA representatives;
- union representatives.

At local level one would expect the involvement of school staff (other than teachers), parents and members of the community, teachers' resource centres, local libraries and information centres, clinics and health workers.

It is important that all stakeholders contribute to the curriculum planning process, because:

- they can give detailed and accurate information;
- they represent interests which need to be taken into account;
- they may be involved in the eventual curriculum implementation;
- they need to be aware of, and feel involved in, the process of curriculum planning.

They should be consulted early and know that their voices are heard and can influence the outcomes. This involvement is organized in the Planning Guide through the use of questionnaires, and by inviting participation of interested parties in the workshop.

User groups

So the Planning Guide can be used by different groups at different levels. For example, at local or regional level, user groups may comprise:

- most of the staff of a single school, or
- several staff from each of a small number of schools, or
- senior teachers from a large number of schools, or
- a mixture of teachers, inspectors and local education authority officials at regional level,

- *plus* other interested parties and stakeholders – for example, parents, health services, school feeding programme, teachers' resource centres, teacher educators.

At national or even international level, user groups may comprise:

- policy-makers and consultants, or
- national curriculum developers, or
- education and health officials from several countries who are interested in developing nutrition education in their areas, whether singly or collaboratively,
- *plus* representatives of other interested sectors (agriculture, health) and organizations (PTAs, teachers' unions, school feeding programmes, aid agencies, NGOs), writers and teacher educators.

Uses of the Planning Guide

The main use of the Planning Guide is curriculum development in the broad sense, covering action in the school environment as well as the classroom, involving the family and community and all relevant sectors and stakeholders. In addition to this, it may be used for producing policy documents or for advocacy. The Guide is *ipso facto* an instrument for teacher development, which can be institutionalized in teacher education programmes. It is also an essential prerequisite to the development of teaching materials and lesson plans for nutrition education. Table 3 shows curriculum developers, their potential collaborators, and the uses of the Planning Guide at both national and local levels.

WAYS OF USING THE MATERIALS

The materials are fully self-explanatory. They can therefore be read as a book or used in a workshop by individuals or groups:

- *As a book* – Individuals can read the explanatory text in the Reader to get an idea of what the curriculum planning process entails.
- *As a self-access workshop* – Individuals or small groups can read the text in the Reader and work through all the related activities. This can also be done as a simulation, with given data and case study material, for initial teacher training.
- *As a workshop* – A facilitator introduces the content of each unit and participants work through the activities together, contributing their knowledge, expertise and opinions. Participants can take turns to be the facilitators. Information and guidance on organization and delivery of workshops is found in the "Notes for Facilitators and Workshop Organizers" in the Activities Volume, and more specifically at the beginning of each Activity.

TABLE 3 Users and uses

National (or international)		
Curriculum developers • Ministry of Education (policy-makers, inspectors, advisers) • Curriculum Development Department • Teacher Education Department • Textbook writers • Examination Boards	***Stakeholders and consultants*** • Ministry of Health • Ministry of Agriculture • National Nutrition Agency • National PTA • Community Services • School Feeding Programme • National media • Publishers • International aid organizations • National NGOs • Teachers' unions	***Uses*** • To review the Planning Guide for local use, or for initial or in-service teacher education. • To develop policy and advocacy documents. • To develop a national curriculum or curriculum proposals based on perceived needs, including guidelines for schools on how they can support the classroom curriculum (by involving family and community, using the school environment, and enlarging the teaching approach). • To produce a blueprint for teaching materials for nutrition education. • To involve other sectors, organizations and initiatives in a coordinated policy on nutrition education in schools.
District or local		
• Local education authority • Teachers and head teachers • Resource Centre leaders • Local teacher-educators • School inspectors and supervisors • Teachers as materials writers	• Other school staff • Children • Parents • Local school feeding programme • District nutritionists and health workers • Community representatives • Local NGOs, e.g. the local Council, Water Board • Local media	• To develop school policy and mission statements on nutrition education. • To develop a local curriculum for nutrition education, based on perceived local needs, practices and expectations, OR to extend and improve the existing nutrition education curriculum and the teaching approach. • To develop action plans for the school environment. • To involve family and community in nutrition education as contributors and as final consumers and evaluators. • To develop teachers' capacities for delivering nutrition education through in-service education. • To develop awareness in school staff of their role in promoting health and good nutrition. • To involve other sectors and local organizations in supporting school nutrition education.

WHICH LEVEL – NATIONAL OR LOCAL?

Some tasks belong at national level, for example, advocacy, government policy, and coordination with major aid programmes. Others are largely the responsibility of individual schools, for example, liaising with families and the local community.

Establishing effective school-based nutrition education for the first time is ideally accomplished through *coordinated interventions at different levels of the education system*. For example, there can be advocacy at policy level, the provision of learning materials for children and their parents at national level, training for teachers at regional level, and at local level, raising awareness in schools of the need to establish lifelong healthy eating habits.

At any level this Planning Guide may be used as the basis for an awareness-raising exercise, after which participants act in their regions or schools as they see fit. It may also be used experimentally to pilot the curriculum development process in local districts and feed findings to a national committee.

Within this multiple-level framework, the main responsibility for curriculum development will fall in different places, depending on the particular education system. Countries will differ in how responsibility is distributed for the various areas of the *tripartite curriculum*. Let us look at some of these potential distributions.

In relation to the development of the *classroom curriculum*:

- Often the classroom curriculum *and* the textbooks are developed at national level and then passed to schools for implementation.
- In other systems the curriculum is outlined in national *objectives*, but there is flexibility in how these are delivered locally. Schools, teachers, publishers, examination boards and students find their own ways to the learning outcomes, and may devise projects and produce their own teaching materials.
- In some places a "local curriculum" is developed by schools and local education authorities in response to local concerns, and ratified nationally or at district level.

In relation to *families and communities*:

- Schools generally have a free hand and are certainly capable of developing these relationships autonomously to support nutrition education, with the help of the Planning Guide.
- However, there may not be a school tradition of involving outsiders in what happens in the school. For example, there may be no precedent for giving classroom teaching an "outreach" dimension, or of promoting extra-curricular activities – Open Days, special projects, school trips, child-to-child programmes, health clubs and so on. There may be little awareness of the need to enlist family and community support in helping children to learn to eat well.

- Education ministries or local education authorities may see the need for intervention from above in the form of encouragement, support and guidance.

In relation to the *school environment*:

- Responsibility for the school environment may belong to the school, the council, a church, the local or national education authority.
- Freedom for the school to take action in its own environment may be constrained by custom or lack of funds. But there is generally room for manoeuvre and there is nothing to stop schools from recognizing the school environment as a "curricular element" which can contribute to their existing health and nutrition education programme.

These considerations, among others, will determine who first uses the Planning Guide. The Planning Guide can help to raise awareness and plan action. The question is whether the initiative for developing nutrition education can be taken independently by schools, or whether there is a need for top-down support.

USING THE PLANNING GUIDE AT LOCAL LEVEL

The Planning Guide aims at local relevance, and adapting the curriculum to local nutritional problems, practices and produce. This direct concern with the community and the immediate environment makes it natural to implement it at local level. The Guide may be used to develop or improve any part of the curriculum, resulting in concrete action plans for a two- or three-year period. The initiative may be taken by schools themselves, or mandated by the local education authority, or built into the in-service teacher education programme. Here are two possible local approaches:

- If a local curriculum – that is, a classroom curriculum supported by the other two "outreaching" pillars – is being planned and planners see nutrition education as a priority, the Planning Guide is their natural instrument for developing this. Ideally, the Guide would be used in full to develop this curriculum.
- If there is no local curriculum, there is still scope for significant changes in the content and teaching approach of whatever nutrition education already exists within the school. As long as the classroom curriculum is even slightly open to adaptation, interpretation or supplementation, the Guide can be a useful basis for doing this. For example, there is also always room for outreach activities, dialogue with the community and intelligent use of the school environment– school meals, food vendors on the school premises, the school garden, washing facilities – as a source of education.

Most classroom teachers are perfectly capable of going through the processes in the Planning Guide. The workshop is organized in such a way that the reading load is

light, the activities and inputs are varied, the outputs are clearly visible. Most of the time is spent in discussing practical questions.

It is no argument to say that capacity is lacking at local level: the Planning Guide *builds* capacity, and the more teachers who go through it the better. Using the Guide for in-service teacher education, for example, raises awareness of nutrition issues, builds a common culture and produces an educated workforce.

However, schools must not only be able but also willing and authorized to make change. Where teachers are poorly paid, have very little time and are under pressure to get children through exams, they need considerable institutional encouragement to undertake changes. The local education authority or the Ministry of Education should offer incentives and support for schools to run the workshop and implement its decisions. For example, they may (without a great deal of effort):

- adopt the principles of the Planning Guide as a national strategy for nutrition education;
- advise schools and local authorities how to use it to take decisions about classwork or the school environment;
- appoint a national coordinator to facilitate this initiative;
- encourage local inspectors and advisers to carry out the situation analysis in the Planning Guide and to discuss how their findings can be used by schools;
- negotiate aid for improving school environments or feeding programmes;
- advise schools on sources of funding and brief education authorities to assist schools with funding applications.

Other actions for helping schools to extend nutrition education through family, community and the school environment are suggested below in Appendix 1.

USING THE PLANNING GUIDE AT NATIONAL LEVEL

At national level the principles and processes of the Planning Guide can have a much wider effect.

A *national working group* or *steering committee* should include representatives of:

- the educational departments involved;
- teachers' representatives, e.g. the national teachers' union;
- representatives of families and the community;
- interested international organizations and aid agencies;
- writers, publishers and the media.

That is, as suggested in Table 3. Advocacy will carry added weight if it represents the united opinion of the several sectors concerned. Representatives of these bodies should have the authority to discuss joint initiatives for promoting the tripartite curriculum.

The committee or working group's *terms of reference* may include any or all of these:

1. **Reviewing the Guide for use in local curriculum development or teacher education** – whether pre-service *or* in-service – and suggesting appropriate infrastructural support.

   For local curriculum developers, the group should also consider what national support can be made available, for example:

   - technical information;
   - sources of funding;
   - contacts with relevant national organizations;
   - liaison with other schools or districts through a national coordinator or Web site.

   For teacher education, some parts of the Guide can operate as independent packages:

   - Units A4 and B6 as teacher training in nutrition education methodology;
   - Units B4, C1 and C2 (with suitable case study material) as an assessed project for trainee teachers in developing action plans for a healthy school environment;
   - the two Preparatory Units as general teacher education in nutrition issues.

   Relevant sections of the Guide: All sections.

   Action outcomes:
   - Recommend the Planning Guide for developing the local curriculum and teacher education.
   - Issue a list of resources to assist local curriculum developers.
   - Issue and recommend specific sets of units as training packages for in-service or pre-service teacher education.

2. **Advocacy and policy development**, to:

   - sensitize policy-makers to the importance of good nutrition for education and the overall development of a country;
   - win a distinct (or larger) place for nutrition education in the curriculum;
   - extend the idea of nutrition education to a more needs-based philosophy, with wider participation and a more active, participatory approach.

   Phase A of the Guide can serve as the basis for a draft policy statement setting out the principles of nutrition education, or can supply arguments for curriculum discussions and cross-curricular planning exercises.

Phases B and C will be necessary if detail is required and specific strategies are to be recommended for handling the curriculum development process. For example:

- research into the dietary needs of schoolchildren;
- integrated action with other sectors;
- guidelines for schools on extending nutrition education into the school environment;
- teacher education.

Relevant parts of the Guide: Phase A for principles; Phases B and C for detailed recommendations.

Action outcomes:
- A draft policy statement or advocacy paper.
- Recommended strategies for implementing a nutrition education curriculum.

3. **Using the Guide for national curriculum development**, in which case the committee or working group's terms of reference should cover the wider curriculum – the school environment, family and community – as well as the classroom curriculum.

To develop the classroom curriculum for nutrition education, it will be essential to cover the principles (Phase A) and the situation analysis (Phase B) with regard to:

- the nutrition situation and priority dietary needs (Unit B1);
- existing health and nutrition interventions and programmes (Unit B2);
- the existing classroom curriculum – coverage, development and relevance (Unit B5);
- the existing teaching approach (Unit B6).

Also necessary will be the Classroom Curriculum Chart, and Unit C3 for summing up the main parameters of an effective classroom curriculum. The information required by the situation analysis in Phase B will have to be assembled by means of the Questionnaires and Data Sheets; it may be necessary to commission additional research, for example into dietary practices among schoolchildren.

To develop the other aspects of the curriculum, Units B3, B4, C2 – involving family and community and extending nutrition education into the school environment – are mainly the responsibility of individual schools or school districts but are essential to the success of the programme and will need support from above. National curriculum developers should therefore review these units and consider how to promote this extended learning in support of the new classroom curriculum, for example by:

- establishing and publicizing a national framework for supporting school initiatives – for example, by providing technical information; suggesting sources of funding;

listing contacts in relevant national organizations; providing liaison with other schools and districts through a national coordinator or Web site;
- liaising with other sectors and organizations nationally to promote local cooperation with schools and encouraging parallel or coordinated initiatives – for example, with regard to school feeding, school gardens, provision of safe water;
- publishing in the curriculum document (or as a parallel document) guidelines for school action in dealing with family and community, and for exploiting the school environment for nutrition education (a summary of Units B3 and B4). See Annex 1 for a sample of such "Guidelines for Schools on Extending Nutrition Education into the School Environment and involving Family and Community"; Annex 2 provides a sample of a "School Policy on Nutrition and Nutrition Education";
- issuing Units A2, B3, B4, C1 and C2 as an in-service training package to involve the family and community, and using the school environment;
- airing the wider issues of nutrition education through the media in programmes for schools;
- suggesting Units A4 and B6 as a teacher training package in methodology;
- publishing suggestions for school staff training;
- coordinating with school health and nutrition programmes to ensure that teachers are involved in supporting the programmes educationally and are involved in evaluating them, too.

Relevant parts of the Guide: Phases A, B and C; Questionnaires and Data Sheets; Classroom Curriculum Chart.

Action outcomes:
- A draft curriculum document.
- Establish a support framework for school actions in the school environment, including liaising with other sectors to provide local support.
- Publish guidelines for promoting nutrition education through the school environment and through liaison with families and community (in a curriculum document or separately); publish project outlines for the school environment.
- Issue sets of Planning Guide units as teacher education packages.
- Publish suggestions for school staff training.

4. **Establishing design criteria for teaching materials** based on the template developed for the classroom curriculum and accommodating the principles of the Planning Guide.

Writers aiming to produce materials for the new curriculum will need to cover Phases A and B, which will suggest the criteria for materials design – for example, calling on children's experience, involving the family. If teachers are unused to active, participatory approaches, or not very informed about nutrition, special attention must be given to Teachers' Notes.

If writers are called on to adapt existing teaching materials with supplementary Teachers' Notes and lesson plans, they will find useful the evaluation checklist in Unit B6, section B.3. If they are required to develop outlines for projects for the school environment as a parallel document to the published classroom curriculum, they will need to cover Units C1 and C2.

Relevant parts of the Guide: Phases A and B; Units C1 and C2 for designing projects for the school environment.

Action outcomes:

- Criteria for the design of effective nutrition education teaching materials.

Note: additional suggestions for using the Guide at national level are given in the *Notes for National Curriculum Developers* at the beginning of each unit in the Reader.

PREPARATORY UNIT 1

A GOOD DIET

OBJECTIVES

- To agree what constitutes a good diet
- To recall the functions of the main nutrients
- To review the nutrient content of common foods
- To appreciate the need for variety in a diet
- To recognize individual dietary needs
- To know how to enhance a diet

CONTENTS

KEY MESSAGES

- We need a variety of foods to be healthy and grow.
- Different groups have different dietary needs.
- A healthy diet is not sophisticated or expensive.

SUMMARY

This unit establishes the extended concept of a good diet, which includes quantity, variety, nutritional quality, safety, frequency, social acceptability, food security and adaptation to individual need. It develops these aspects in turn and discusses how to improve diet by adapting and enriching local eating patterns.

NOTE FOR NATIONAL CURRICULUM DEVELOPERS

Use the Reader as a checklist of information and concepts, especially on the importance of variety, on individual dietary needs, and on the idea of the mixed meal guide. Nutritionists and health experts should check that the content of this unit accords with their own ideas of a healthy diet.

For those who need to familiarise themselves with the basic facts and concepts of nutrition, all the activities are useful. They can be done independently or in groups.

INTRODUCTION

■ ACTIVITY 1 *A good diet*

We know food is essential for life, but what food? Most people eat because they feel hungry. Hunger tells them to eat, but it does not tell them *what* to eat.

What is a "good diet"? Some of our ideas about what a good diet is have to do with the quantity and quality of the food it contains. For example, that there should be *enough* food and it should be *nutritious* and *safe*. But there is much more to the concept of a "good diet". To obtain the full range of nutrients we need we must also consume a good *variety* of foods every day. It is also important that we *enjoy* the food we eat and find it *socially acceptable* – this too will keep us healthy. There must also be *enough for everyone* in the household, and *enough for each person*'s different needs. *Frequency* and *security* are important – the right amount of food throughout the day, and enough food all the year round.

So we can say that nutritional well-being requires a variety of nutritious, safe and acceptable food, which meets the dietary needs of all members of the household throughout the day and throughout the year. This is a much wider concept of good nutrition than, for example, "enough proteins, carbohydrates, vitamins and minerals" or "plenty of fruit and vegetables" or "a good breakfast every day" – it includes all of these things, but more besides.

Let's repeat the keywords:

- enough
- varied
- nutritious
- safe
- enjoyable and acceptable
- for all the household
- throughout the day
- throughout the year.

Many of these ideas need expanding – in particular, what is nutritious food? Why is variety so important? What special needs do individuals have – for instance, schoolchildren? And what is the best way to achieve a mixed and balanced diet? These all depend on the question of *why* we need food.

A WHY WE NEED FOOD

▪ ACTIVITY 2 *Why do we need food?*

Food is essential for life. To be healthy and well-nourished, we must consume a variety of nutritious, safe foods. Without adequate nutrition, children and young people cannot develop their potential to the full and adults will experience difficulty in maintaining or expanding theirs.

We must also consume the right amount of food. We can become unhealthy if we do not eat enough food, or not enough different kinds of food, or if we consume too much food. Too much food causes our body to store too much fat, and can increase the risk of chronic diseases such as obesity, heart problems and diabetes.

But what exactly does food do for us? Food provides us with the energy we need for growth, physical activity, and the basic body functions (breathing, temperature control, blood circulation and digestion). It also gives us the materials we need to build and maintain our bodies and to protect them from disease.

These different functions are made possible by the nutrients contained in food. These are carbohydrates, proteins, fats, vitamins, and minerals; fibre (or roughage) and clean water are also needed for a good diet. We need large amounts of proteins, carbohydrates and fats (this is why they are called macronutrients) and much smaller amounts of minerals and vitamins (the micronutrients). Some of these occur in quantities so tiny that we cannot see them, but without them our body systems would not work properly.

B NUTRIENTS AND THEIR FUNCTIONS

▪ ACTIVITY 3 *What nutrients do*

Most farmers know that crops need certain nutrients in order to grow well. Plants obtain these nutrients from the soil (or sometimes from fertilizers). In the same way, people need certain types and quantities of nutrients from their diets, from the time a baby is conceived and throughout life.

Each type of nutrient has particular functions (see Factsheet 1 at the end of this unit for more detail):

- *Carbohydrates and fats* (macronutrients) are the main sources of food energy. About 50 percent of the carbohydrates and fats in the body are burnt, or broken down, to produce the energy the body needs to perform different physical activities. The rest are used by the body for growth and general maintenance, and the renewal of its tissues. Fats are a particularly concentrated source of energy and contain twice as much energy as carbohydrates and proteins. Fats are also needed to help the body absorb and use some vitamins, especially vitamin A.

- *Proteins* are needed to build and maintain muscle, blood, skin, organs, and bones and other tissues – they are the primary building blocks of the body. Proteins are therefore especially important for children, and pregnant and lactating women. Proteins (in the form of enzymes and hormones) are also essential for some basic body functions.
- *Vitamins and minerals* (micronutrients) are needed in smaller amounts than proteins, fats and carbohydrates, but they are essential for good nutrition. They help the body work properly and stay healthy. They help to repair tissue, and ensure children's healthy growth, mental development and protection from infection. Some minerals also make up part of the body's tissues: for example, calcium and fluoride are found in bones and teeth and iron is found in the blood. Some of these essential micronutrients – for example Vitamin A, iron and iodine – are often lacking in malnourished children.

All of us need all of these nutrients all of the time for all our body processes.

C FOOD SOURCES

▪ ACTIVITY 4 *Foods and nutrients*

If we are to evaluate diets and make general suggestions for improving them, we should have at least a basic idea of the nutrient content of foods.

Table 4 gives a list of some foods, from all major food groups, and their main nutrient content (N.B. It does not show *all* the nutrients in these foods).

TABLE 4 Selected foods and their main nutrient content (in 100 g edible portions)

Food	Energy *(kcal)*	Protein *(g)*	Fat *(g)*	Iron *(mg)*	Vitamin A/ β-carotene*(µg)	Vitamin C *(mg)*
Cereals						
Rice (polished)	335	7.0	0.5	1.7	0	0
Millet, bullrush (whole grain)	340	10.0	4.0	21.0	25	3
Starchy roots and fruits						
Cassava (flour)	320	1.6	0.5	3.6	0	4
Sweet potato (yellow, raw)	110	1.6	0.2	2.0	1 800	37
Pulses						
Beans	320	22.0	1.5	8.2	0	1
Groundnuts	570	23.0	45.0	3.8	8	1
Vegetables						
Carrots	35	0.9	0.1	0.7	6 000	8
Sweet potato leaves (raw)	49	4.6	0.2	6.2	2 620	70
Fruits						
Bananas	82	1.5	0.1	1.4	90	9
Papaya (raw)	30	0.4	0.1	0.6	300	52
Meat, poultry						
Beef (moderately fat)	235	18.0	18.0	3.6	24	0
Chicken	140	20.0	6.5	1.1	75	0
Fish						
Fish (average fillet)	115	22.0	3.0	1.7	0	0
Small dried fish	320	44.0	16.0	8.5	0	0
Milk						
Cow's milk (whole)	79	3.8	4.8	0.0	27	1
Oils and fats						
Vegetable oil	900	0.0	100.0	0.0	0	0
Butter (cow)	700	0.0	77.0	0.0	640	0
Other						
Sugar	375	0.0	0.0	0.0	0	0

* Vitamin A in foods of animal origin. β-carotene is preformed vitamin A (Provitamin A), in foods of vegetable origin.
Source (adapted): FAO. 1997. *Agriculture, food and nutrition for Africa: a resource book for teachers of agriculture*. Rome

Even a short glance at the table clearly shows that almost all foods contain not only one, but a mixture of nutrients. Exceptions are oil and sugar, which are basically concentrates of one nutrient (fat and carbohydrates respectively), lacking most other nutrients.

It is also clear from the table that not all foods are equal. Foods from different food groups can contain differing nutrients. Compare, for instance, foods in the meat group with those of the vegetable group: meats are generally rich in protein and some are also rich in fat; vegetables are particularly rich in Vitamins A and C, for instance.

In a nutshell:

- There is no single food that contains *all* the nutrients needed.
- There is no ideal food, i.e. one that contains all or most of the nutrients in large amounts. Some foods may be rich in one or two nutrients, but they are normally comparatively poor with regard to other nutrients. (Breast milk is an exception to this rule: it is the only food a newborn baby needs up to the age of about six months).
- There are many different food sources for each nutrient (as evident from Factsheet 1 at the end of this unit).

▪ ACTIVITY 5 *Your own diet (Optional)*

D DIETARY NEEDS

1. THE NEED FOR VARIETY

What are the conclusions for our diet? First, the best way to make sure that we obtain all the nutrients we need is to eat a *variety* of different foods. This is why diversity in our diets is so important for good health. Second, it is clear that there is not just one good diet. Our food energy and nutrient needs can be met with a *range* of different foods – that is, with many different, culturally appropriate, healthy diets.

Even if we eat enough food to meet our energy needs, we can still be unhealthy if we do not eat the right kinds of *different* foods we need. The best way to make sure that we obtain all the nutrients we need is therefore to eat a variety of different foods (see Figure 4).

FIGURE 4 Food Groups – We need many different foods

Source: FAO. 2001. *Improving nutrition through home gardening. A training package for preparing field workers in Africa*, p. 41. Rome

WE NEED A VARIETY OF FOODS TO BE HEALTHY AND GROW.

2. DIFFERENT GROUPS HAVE DIFFERENT NEEDS

■ ACTIVITY 6 *Individual needs*

Different people need different kinds and amounts of food. People need more food if they are growing, or helping others to grow – for example infants, children and pregnant and breastfeeding mothers. They need more food if they work and play hard. And they may need more food if they are sick.

The most critical stage of human development is from conception to about three years of age, a period when physical growth occurs most rapidly. *Pregnant women* need additional food of good quality to meet the nutrient needs of a growing foetus. *Lactating mothers* require additional energy and nutrients to produce enough milk for a small child. *Small children* need to receive the right amount of nutritious food in order to ensure proper growth, brain development and resistance to infection. A child under one year of age, for example, requires almost twice the amount of energy per kilogram of body weight as a teenager or adult.

When breastmilk given alone becomes insufficient for healthy, normal growth (at about six months of age), *young children* must be given foods that have a high concentration of nutrients. This is particularly important because children at this age have very small stomachs and can take in only limited quantities of food at a time. Frequent feeding (four to five times a day) with foods, in addition to breast milk, ensures that children obtain sufficient energy and nutrients to grow normally and stay healthy. Mothers should continue breastfeeding on demand until children are 18 months to two years of age.

All growing children, including schoolchildren, have big food needs but small stomachs. They therefore need to eat frequently – at least three times a day, with snacks in between.

Older people, like everyone else, need a good diet that provides for all their nutrient needs. They have some special problems. If they are unfit and take very little exercise, they may need less energy and may therefore eat less food. This means they may also obtain less micronutrients – even though they need just as many as they would if they were active. If they have lost a lot of teeth, or have gum problems, they may find it difficult to chew ordinary foods. Diets for older people should therefore be particularly rich in micronutrients; their foods should be easy to eat if there is a problem with their teeth.

Sick people often have no appetite and eat only small amounts. They may be malnourished. Diarrhoea adds to the problem – up to half the food taken in can be lost. When people have infectious diseases the need for certain nutrients is even greater than normal. Sick people need a diet which is appealing, not too bulky and particularly rich in micronutrients and protein.

Individual needs are often not recognized in a household, sometimes because of social patterns, sometimes because people don't have time to spare and sometimes because people can't or won't speak out. In some societies men eat first, in the greatest quantities and apart from others, while women and children eat what's left. In some families, parents have to go out early to work and leave children to fend for themselves. These may be difficult culturally-sensitive issues, but they must be tackled if they affect children's health and growth – which they often do.

DIFFERENT GROUPS HAVE DIFFERENT DIETARY NEEDS.

3. THE NEEDS OF SCHOOLCHILDREN

Why school-age children need good food

Like other members of the family, children of school-age need to eat a healthy balanced diet. They are growing fast through their primary school years, and there is a strong spurt of growth from 11 to 16 years. Children often gain half their final body weight during adolescence, between 10 and 18 years. Their diets must therefore satisfy the high demands of rapid growth and often intense physical activity – their food intake must cover energy needs as well as nutritional needs. It is especially important that girls eat well so that when they are women, they are well nourished and can produce healthy babies. Adolescent boys have especially high energy needs. That is why they are often hungry and eat a lot.

Schoolchildren who are hungry or who have poor diets are likely to:

- grow slowly;
- have little energy to play, study or do physical work;
- have short attention spans and do less well at school than they should;
- suffer from vitamin and mineral deficiencies (e.g. vitamin A, iron, iodine).

The *energy needs* of children at school-age can differ considerably. These needs vary according to a child's body size (height, weight), sex, and their habitual level of physical activity (from sports, play or work). Table 5 shows the energy needs of boys and girls at different ages and at an average (moderate) level of physical activity.

TABLE 5 Energy needs (kcal) of schoolchildren

Age (years)	Boys	Girls
7 – 9	1 760	1 625
10 – 12	2 250	2 075
13 – 14	2 775	2 375

Source (adapted): FAO. 2004. *Energy in human nutrition. Report of a joint FAO/WHO/UNU*[1] *expert consultation*. FAO Food and Nutrition Paper No. 78. Rome.

[1] Food and Agriculture Organization of the United Nations/World Health Organization/United Nations University

How the dietary needs of schoolchildren can be met

Just as for adults, a healthy diet for schoolchildren is a mixed and balanced diet, which:

- provides all the nutrients they need;
- meets the energy needs of the individual child;
- combines a wide mixture of foods from different food groups;
- is tasty (children like it);
- does not require extraordinary efforts (time-wise and financially).

To obtain the food they need in order to grow well, and be healthy, active and alert, school-age children should have three good meals and some snacks each day:

- *Breakfast* – This meal is always important but especially so if the child has to walk a long way to school or does not eat much at midday. One example of a good breakfast is a starchy food (porridge, bread or cooked cassava) with milk, margarine, peanut butter or cooked beans, and fruit.
- *A meal in the middle of the day* – Parents or caregivers should try to give children a mixture of different foods if they take food to school, e.g. bread, an egg and some fruit. If children buy food from street vendors or kiosks, they should know which foods give the best value for money. If the school provides meals or snacks, these should be as healthy and well-balanced as possible.
- *A meal later in the day* – This may be the biggest meal of the day for many children, so it is important that it is a healthy balanced meal (see next section). It is important to realize that fast-growing children are usually hungry children and are not being greedy if they want to eat a lot.
- *Snacks* – These are extra food, in addition to regular meals. Snacks can often be quite nutritious and high in energy, especially if they are fried in oil. Box 1 shows some examples of both good and poor snacks for school-age children. Children should know that sweets, sodas (soft drinks) and lollies are bad for their teeth and poor value for money.

Box 1 Snacks for school-age children

Examples of good snacks

These snacks are often good value for money:
- boiled, pasteurized or soured milk;
- bread or chapati (fried wheat bread), especially with an energy-rich food such as margarine, groundnut paste or sesame paste;
- doughnuts, bean cakes, biscuits;
- boiled or fried cassava, plantain, yam or potato (e.g. chips);
- boiled or roasted maize cobs;
- bananas, pawpaw, avocado, mango, oranges and other fruits;
- coconut flesh;
- boiled egg;
- cooked groundnuts, soybeans and other oilseeds;
- small fried fish;
- insects such as locusts or termites;
- sugar cane.

Examples of poor snacks

These snacks are often poor value for money, and eating them frequently can prevent children eating sufficient healthy foods. They should be kept for special treats:
- sodas
- sweets and lollies
- ice-cream
- glucose powder and tablets
- crisps and other similar snack foods.

Source: King, F.S. and Burgess, A.1993. *Nutrition for developing countries*. Oxford, UK, Oxford University Press.

ACTIVITY 7 *Good and bad diets for schoolchildren*

An example of food recommendations for children

An example of recommended food quantities in children's diets is given in Table 6. It is important to note that this is only an example, not a prescription. It is only an idea of a good diet for children, and is largely based on dietary habits that are more typical in the northern half of the world. In a country with a distinctly different eating culture, it would need to be thoroughly adapted to the local food supply, people's common food habits, and also to national dietary guidelines.

With the recommended foods in the table, children would cover about 80 percent of their energy needs, but already 100 percent of their nutrient needs. In other words, if the bulk of a diet is made up of nutritious, recommendable foods, small amounts of "not-so-nutritious" foods (including sweets and fatty snacks) can be included without making the diet unhealthy overall. "Tolerable foods" should provide not more than 20 percent of food energy intake; "free sugars" (sugar added to foods by producer, cook or consumer) should be less than 10 percent of food energy intake.

The quantities mentioned in the table can differ substantially from child to child, depending on body size and physical activity. Quantities also depend on the overall eating habits and food intake of the region concerned. In the region this example is taken from, it is recommended not to exceed the quantities mentioned for fats and animal foods. But in another region – where for instance the consumption of fat and animal foods is traditionally low – it may be advisable to increase the intake of those

foods. Whatever the region, there is no limitation on foods of plant origin. Similarly, the amount of fluids should not be restricted.

TABLE 6 Recommended food quantities for schoolchildren (an example)

Foods	Quantity	Age		
		7 – 9 years	10 – 12 years	13 – 14 years
Plenty of…				
Drinks, fluids	ml/day	900	1 000	1 200
Cereals; cereal products e.g. bread, pasta; starchy staple food e.g. potatoes	g/day	340	410	480
Vegetables, inc. pulses	g/day	200	230	250
Fruits	g/day	200	230	250
Sufficient/moderate...				
Milk, milk products	ml/day or g/day	400	420	450
Meat, meat products	g/day	55	65	75
Eggs	item/week	2	2–3	2–3
Fish	g/week	150	180	200
A little...				
Oil, butter, margarine	g/day	30	35	35
Tolerable foods				
e.g. cake, biscuits, sweets	g/day	up to 50	up to 80	up to 80
Jam, sugar	g/day	up to 10	up to 20	up to 20

Source (adapted): Alexy, U. & Kersting, M. 1999. *Was Kinder essen – und was sie essen sollten.* Munich, Deutsches Forschungsinstitut für Kinderernährung Dortmund.

Obesity among children and teenagers has reached alarming levels in most industrialized countries, and is increasingly becoming a problem in developing countries, especially in urban areas. Children, like adults, are at risk of obesity if they eat too much energy-rich food – such as fatty foods, and foods with high sugar content like soft drinks and sweets – and if they take too little exercise.

E HOW TO COMPOSE A MIXED AND BALANCED DIET

1. *DIETARY GUIDELINES*

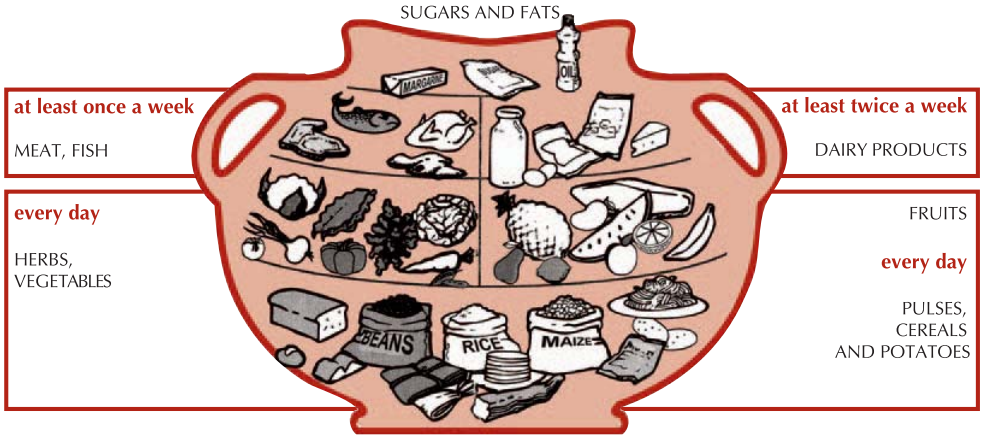
Experts in many countries have analysed national eating patterns in order to formulate national dietary guidelines that can help people to eat (more) healthily. These guidelines – examples of which are in Factsheet 2 – suggest food choices which are appropriate to the country. They also often give guidance in other areas related to good health, such as lifestyle, hygiene and sanitation.

Since such guidelines are specifically tailored to the food, nutrition and health situation of a given country, most of the individual guidelines would need to be adapted before becoming relevant and appropriate for another country. Most guidelines,

unfortunately, are not specifically about children's nutrition, but they can nevertheless often be appropriate to children also.

National dietary guidelines are also often summarized visually, in the form of a "food guide" – perhaps in the form of a circle or pyramid. Figure 5 shows an example of the food guide of Guatemala – in the form of a widely-used local food jar.

FIGURE 5 Guatemala Food Guide (1998)



Source: Comisíon Nacional de Guías Alimentarias de Guatemala (CONGA). 1998. *Guías alimentarias para Guatemala.*

The principal message of this food guide is to encourage the regular consumption of foods from all the different food groups regularly, and in the proportions indicated by the size of the various segments. The country's dietary guidelines (see Factsheet 2) provide additional specific guidance, in text form, on how to compose a healthy diet.

If dietary guidelines exist for your country, they can provide valuable hints about nutritional issues in your region and help in selecting topics for special emphasis in nutrition education. Such guidelines are also a good starting point for discussions with parents, health authorities and the children themselves. They can suggest ideas for nutrition promotion activities in schools, with parents and in the community.

▪ ACTIVITY 8 *Dietary guidelines*

2. THE LOCAL DIET

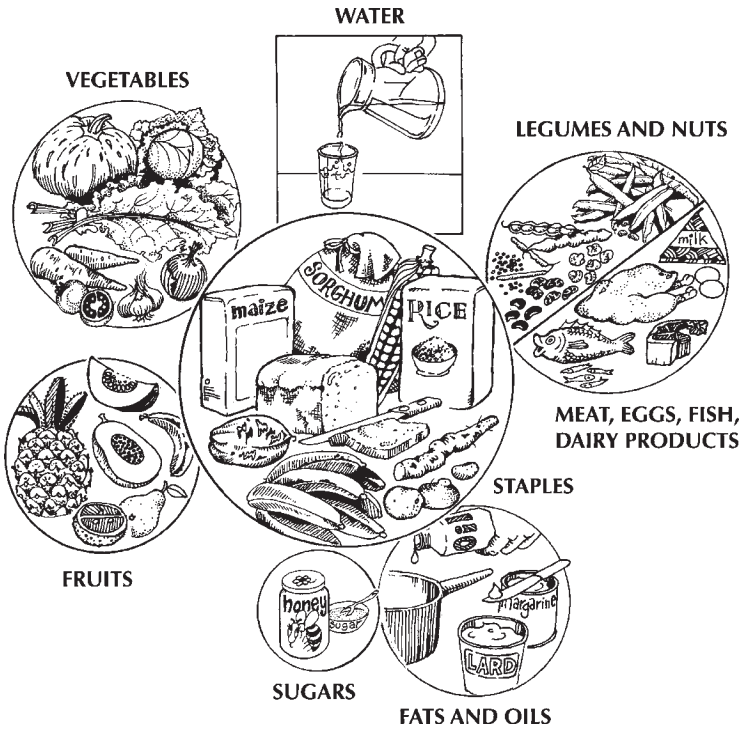
▪ ACTIVITY 9 *The local diet*

Dietary guidelines have to be locally specific, as emphasized in the previous section. However, the recommendation to eat a wide variety of foods appears in literally *all* national dietary guidelines. Indeed, it is based on the key fact we discussed in Section C above – there is not a single food which provides all the nutrients we need.

Most regions in the world have a traditional or local pattern of eating that provides the variety needed for health and growth – provided, of course, enough of these foods are available and people can afford them. This established pattern must be the basis for improving the diet.

A practical approach to healthy eating is to make sure we consume a variety of foods, focusing on the traditional staple food (for example rice, wheat, maize, cassava or potatoes) and its accompaniment – the side dish, relish, soup or stew (see Figure 6).

FIGURE 6 Family mixed meal guide



Source : FAO. 2004 *Family nutrition guide.* Rome

This accompaniment can provide:

- additional energy – in beans, peas, groundnuts and oil);
- additional protein – in beans, peas, groundnuts, meat and fish);
- essential micronutrients – in vegetables, fruits, meat and fish).

The accompaniment also increases palatability of the food by adding flavour, colour and different textures, e.g. liquid, soft, solid, crunchy. All this can make a meal more appealing and increase appetite – it encourages people to eat enough food of the right kinds. Monotonous food would lack such stimulus.

A healthy meal might consist of a staple as the main food, with smaller amounts of vegetables, legumes, meats, fish or poultry and sauces added. A sauce containing fat may be a valuable addition since there is often not enough fat in the diet in developing countries. If there is enough food for all and a sufficient variety of foods, and if the overall nutrient composition meets the requirements of all household members, then such a diet is a healthy and balanced diet. Remember also that it need not be sophisticated and expensive.

Improvements in diet should fit local eating patterns and expectations and use foods which are plentiful locally. One reason is economic; another is that a diet which depends on local foods is more sustainable. Moreover, people are creatures of habit and often reject changes, especially large ones. It is usually possible to increase the nutritional value of a diet considerably by making only small changes and additions.

Figure 6, the *Family mixed meal guide*, shows how we can compose a mixed, nutritious and tasty meal by starting with the local staple food, then adding other locally available foods which are in line with local eating patterns and customs. It is obviously best if the combination also supplies what may be lacking in the staple food – for example, extra protein where the staple is starchy roots and tubers, or dietary fibre in the case of highly milled cereals. To achieve these combinations it is useful to have some basic knowledge of the nutrient content of the local foods.

If a family has such mixed meals on a *daily* basis, and if in addition they take into account the individual nutritional needs of the various family members (particularly young children, and pregnant and lactating women), then the whole household will be enjoying a "healthy and balanced diet" – a good basis for nutritional well-being, health and growth.

A HEALTHY DIET IS NOT SOPHISTICATED OR EXPENSIVE.

F REGULAR FOOD SUPPLY

As we have shown, good nutrition requires that a number of criteria be met. A diet can only be considered good if it is composed of foods that are nutritious and safe, if it involves a variety of foods and if it meets the needs of all household members. But foods must also be regularly available to the individuals of a household. We all know this from our own experience: every day one feels hungry again. Our dependency on water is even more striking: while we can skip solid foods for quite a while, a complete lack of water intake is fatal for an adult within just three days – and for children even earlier.

The reason why we must take in food regularly is that the human body can store large amounts of some nutrients but very little of others. The differences are considerable. For

example, energy reserves in the form of body fat can bridge shortages of many weeks. Stores of some vitamins and minerals can last for several months. But body stores of other vitamins are much smaller – in particular the so-called "water-soluble" vitamins like vitamins C, B_1, B_2, B_{12}, niacin and folic acid – and can be depleted within a few days. Overt nutrient deficiencies can then develop rapidly. Diseases can pose an additional demand on some nutrients and hence speed up the depletion of their body stores even further. Small children once again are at particular risk because their small body size limits the size of possible body stores. Frequent infectious diseases also contribute to the depletion of their body stores. And, because they are growing, children already have a higher need for all nutrients.

It is therefore essential to ensure that a wide variety of foods are available all year round for all members of the household, not least for children, and pregnant and lactating women. Considerable efforts must also be made to enrich diets in "low/dry seasons" when people in many poor countries often depend on only a small variety of foods, and in insufficient amounts. Stability of food supply is therefore one of the crucial elements of "household food security" (see also Preparatory Unit 2).

G CONCLUSION

To sum up, a healthy diet can be based on local eating patterns, using locally available foods and respecting local eating customs. A healthy diet:

- regularly includes a variety of foods from different food groups;
- meets the needs – for food energy, nutrients and meal frequency – of all groups of people;
- is safe – there are no risks from toxins, mould, chemicals, dirty hands;
- can be enjoyed and approved by all, i.e. is in line with cultural values and social norms;
- is "sufficient" all year round – at any time of year people are able to feed themselves well.

▪ ACTIVITY 10 *Summing up*

FACTSHEET 1 The main nutrients, their functions and food sources

Nutrients	Functions	Good food sources
Macronutrients		
Proteins	Build and maintain muscle, blood, skin, bones and other tissues and organs in the body; are essential (as enzymes and hormones) for many metabolic processes	All types of meat, poultry, fish, beans, peas, soybeans, groundnuts, milk, cheese, yoghurt and eggs
Carbohydrates	Provide energy	All cereals (rice, maize, wheat, millet, etc.); starchy roots and fruits (cassava, potatoes, yams); sugars
Fats	Provide energy; some fats are needed as building materials and help the body to use certain vitamins	All vegetable and animal oils and fats; lard, butter, ghee, margarine; some meat and meat products; some types of fish, nuts and soybeans
Micronutrients		
Vitamin A	Needed for building and maintaining healthy tissues throughout the body, particularly eyes, skin, bones and tissues of the respiratory and digestive tracts. It is also very important for effective functioning of the immune system. The body converts β-carotene from plants into vitamin A.	Breastmilk, liver, eggs and dairy products; palm oil; many dark-coloured fruits and vegetables (e.g. carrots, dark-yellow and orange sweet potatoes, pumpkin, mango, papaya)
Vitamin B complex: Thiamin, riboflavin, niacin, vitamin B_6, folate, pantothenic acid, vitamin B_{12} and biotin	Necessary for converting carbohydrates, fat and protein into energy and for using them to build and repair the body's tissues. Folate (folic acid, folacin) is needed to make healthy blood cells. Adequate daily intake of the B vitamins is important	Dark-green vegetables, groundnuts, beans, peas, cereals, meat, fish, eggs, dairy products
Vitamin C	Needed to increase absorption of dietary iron, to make collagen (connective tissue) which binds the body's cells together, and to serve as an antioxidant	Most fruits, especially citrus and guava, and many vegetables, including potatoes
Vitamin D	Important in the use of calcium by the body	Fish oils, eggs and milk; is also produced by the body when the skin is exposed to sunlight
Iron	A major component of red blood cells; necessary to keep all of the body's cells working properly	Liver, meat, cereals (especially whole grain), fish, eggs, many legumes, green leafy vegetables and dried fruits. (Iron from vegetable sources is not absorbed as well by the body as is the iron from animal products – if Vitamin C is eaten along with the vegetable sources of iron, more iron is absorbed and utilised.)
Calcium and phosphorus	Important to body maintenance and to having strong healthy bones and teeth	Milk and dairy products; small fish eaten with bones; beans and peas; finger millet; dark-green leaves
Iodine	Important for proper physical growth and mental development	Seafood and foods grown on iodine-rich soils. In areas where soils are low in iodine, steps should be taken to add iodine to the diet, usually through iodized salt.
Additional, important dietary components		
Fibre (or roughage) a group of indigestible and unabsorbable particles	Provide a vehicle for other nutrients, add bulk to the diet, provide a habitat for bacterial flora and assist proper elimination of refuse	Wholegrain cereals, starchy roots, fruits, most vegetables, beans, peas, oilseeds
Water	Provides body fluid and helps regulate body temperature	

Factsheet 2 Examples of dietary guidelines for the general public

Australia
Dietary guidelines for Australians (1991)
- Enjoy a wide variety of nutritious foods.
- Eat plenty of breads and cereals (preferably wholegrain), vegetables (including legumes) and fruits.
- Eat a diet low in fat and, in particular, low in saturated fat.
- Maintain a healthy bodyweight by balancing physical activity and food intake.
- If you drink alcohol, limit your intake.
- Eat only a moderate amount of sugars and foods containing added sugars.
- Choose low salt foods and use salt sparingly.
- Encourage and support breastfeeding.

China
- Eat a wide variety of foods; cereal/grain should be the main food.
- Eat more vegetables, fruits and potatoes (including sweet potatoes, cassava).
- Take milk, soybeans and their products every day.
- Increase intake of fish, poultry, eggs, lean meat. Reduce intake of fat and oil.
- Balance food intake with physical exercise, keep proper weight.
- Take food which is light, with less oil and less salt.
- If you drink alcohol drink a limited amount.
- Do not eat rotten food or food which has gone bad.

Guatemala
Dietary guidelines for Guatemala (1998) – translated –
- Include grains, cereals and potatoes in all meals because they are nutritious, low cost and tasty.
- Eat herbs or vegetables every day, as they are good for your health.
- Eat fruit of any kind every day, because it is healthy, nutritious and easily digestible.
- If you eat tortillas and beans daily, eat a spoonful of beans with every tortilla – they complement each other very well.
- At least twice a week, eat an egg, or a piece of cheese, or a glass of milk, in order to supplement your diet.
- At least once a week, eat a piece of liver or meat to stay healthy and strong.
- To stay healthy, practise a varied diet.

Namibia
Food and nutrition guidelines for Namibia (2000)
- Eat a variety of foods.
- Eat vegetables and fruits every day.
- Eat more fish.
- Eat beans or meat regularly.
- Use whole-grain products.
- Use only iodised salt, but use less salt.
- Eat at least three meals a day.
- Avoid drinking alcohol.
- Consume clean and safe water and food.
- Achieve and maintain a healthy bodyweight.

The Philippines
Nutritional Guidelines for the Philippines (06/2000)
- Eat a variety of foods every day.
- Breastfeed infants exclusively from birth to 4–6 months, and then give appropriate foods while continuing breastfeeding.
- Maintain children's normal growth through proper diet, and monitor growth regularly.
- Consume fish, lean meat, poultry or dried beans.
- Eat more vegetables, fruits, and root crops.
- Eat foods cooked in edible/cooking oil daily.
- Consume milk, milk products or other calcium-rich foods such as small fish and dark green leafy vegetables every day.
- Use iodized salt, but avoid excessive intake of salty foods.
- Eat clean and safe food.
- For a healthy lifestyle and good nutrition, exercise regularly, do not smoke, and avoid drinking alcoholic beverages.

Thailand
Food-based dietary guidelines for Thai (2000)
- Eat a variety of foods from each of the five food groups and maintain proper weight.
- Eat adequate amounts of rice or alternative carbohydrate sources.
- Eat plenty of vegetables and fruits regularly.
- Eat fish, lean meat, eggs, legumes and pulses regularly.
- Drink milk of appropriate quality and in appropriate quantities for your age.
- Eat a diet containing appropriate amounts of fat.
- Avoid sweet and salty foods.
- Eat clean and safe food.
- Avoid or reduce the consumption of alcoholic beverages.

PREPARATORY UNIT 2

MALNUTRITION AND ITS CAUSES

OBJECTIVES

- to know the main types of malnutrition and their effects
- to recognize warning signs in the classroom
- to recognize the complex causes of malnutrition
- to recognize strategies for fighting malnutrition, particularly the role of education

CONTENTS

KEY MESSAGES

- Malnutrition affects learning.
- Malnutrition can be difficult to recognize.
- Teachers should be sensitive to warning signs.
- Malnutrition has many causes.
- Education can fight malnutrition.

SUMMARY

This unit deals with the main types of malnutrition, their symptoms and their effects. It discusses how schools can recognize malnutrition and what can be done about it in the short term. It looks at the complex causes of malnutrition and how these can be tackled; what impact education can have; why it is so important to learn about healthy nutrition at school.

NOTE FOR NATIONAL CURRICULUM DEVELOPERS

Like Preliminary Unit 1, the Reader for this unit can be used as a checklist of information and concepts – especially on types of malnutrition, how they can be recognized, and how they affect classroom behaviour. Nutritionists and health experts should check that the content of this unit accords with their own ideas. You will need to agree with your colleagues on the root causes of malnutrition and the concept of "household food security", and consider briefly how useful these may be in diagnosing the nutritional problems of your own country. (The specific nutritional problems of the country will be discussed in Phase B of the Planning Guide.) The role of education and schools will also be developed in greater depth later. At this point it is important to notice how wide is the scope of schools' possible responses to local nutrition issues. You may find it useful, after reading the unit, to use the Poster Material at the end of the Activities as a basic agenda for discussion.

For those who need to familiarize themselves with the basic facts and concepts of malnutrition, all the activities are useful; they can be done independently or in groups. For those not directly involved in the education system it will be worthwhile to look through the case studies in Activities 3, 4 and 5. Activities 6 and 7 (dealing with the causes of malnutrition and the role of education) are good for defining preconceptions.

INTRODUCTION

■ ACTIVITY 1 *Terminology*

A "bad diet", as we have seen, is generally one which lacks essential nutrients and energy foods. People have a bad diet when they do not have enough to eat in general, or have a diet which is not varied and balanced.

A "bad diet" can also be one which has an *excess* of food energy and some nutrients. Overnutrition is normally caused by eating too much food in general, or too many energy-dense foods, along with very little physical activity. Interestingly, overnutrition (with regard to food energy) often goes with a lack of some essential nutrients (in particular, iron and vitamin A) in the diet of the very same person.

Malnutrition therefore includes overnutrition as well as undernutrition, and is found in developed as well as in developing countries. Although overnutrition and obesity rates are growing rapidly, particularly in urban areas of developing countries, the most widespread problems in developing countries still spring from *under*nutrition – a lack of food energy and essential nutrients (see Table 7).

TABLE 7 Terminology

Various terms are used when talking about malnutrition:

- *Malnutrition* is a general term covering health disorders caused by insufficient or excessive intake of nutrients and food energy. It includes *overnutrition* as well as *undernutrition*.
- *Hunger* describes the physiological and psychological unease caused by lack of food. It is a subjective phenomenon. The term is occasionally also used to refer to the state of insufficient overall food intake of entire population groups.
- *Undernutrition* is any condition caused by a lack of nutrients and food energy. Undernutrition can be further subdivided according to the specific nutrient lacking – e.g. protein-energy malnutrition (PEM), or specific nutrient deficiencies. In the real world PEM commonly occurs in combination with some kind of micronutrient deficiency.

What happens if people do not have a healthy diet? The effects are not only physical, but mental, social and economic. Inadequate diet in infants and young children slows down or stops growth, weakens the body and impedes intellectual development. Children of school age who do not get enough nutritious food are unable to concentrate and do not learn as well as well-nourished children. An inadequate diet also affects older children and adults. Many households have limited labour available for work on their own farmland or in other jobs. A poor diet results in reduced work capacity and illness. Illness means not only physical suffering and mental stress, but also visits to the health centre, which mean lost working time and lost money. Inadequate diet can have far-reaching effects on socio-economic development. This is a situation that no country can afford.

A COMMON TYPES OF MALNUTRITION AND THEIR EFFECTS

Some of the commonest forms of malnutrition are: a lack of protein and energy foods; short-term hunger; iron deficiency anaemia; Vitamin A deficiency; iodine deficiency; Vitamin B deficiency; obesity; intestinal parasites; the eating disorders anorexia and bulimia. These are set out in Table 8, which also shows the clinical signs of these disorders and their behavioural effects.

We can see from the table that all forms of malnutrition have an effect not only on the body but also on learning behaviour. They may have long-term effects on the brain, cause illness and absences, or simply make children tired, irritable and inattentive. Even mild hunger during the school day – so-called short-term hunger – affects attention span and learning capacity. In this way the health status of children influences their education considerably. Hungry children find it hard to learn.

▪ ACTIVITY 2 *Effects of malnutrition*

KEY MALNUTRITION AFFECTS LEARNING.

B RECOGNIZING SIGNS

It is not really a teacher's job to make a diagnosis such as "this child has iodine deficiency". This should be left to health professionals. But schools can still play a role in picking up early warning signs and identifying children who need help. The way children behave in the classroom can give important information about their nutritional status and health.

▪ ACTIVITY 3 *Recognizing signs*

It is essential to recognize that malnourished children often do not appear to be malnourished. The warning signs are sometimes subtle. In the case of micronutrient deficiencies, it is not always easy to see physical changes, unless there is a severe lack of these nutrients over a long period. Children who are undernourished in food energy and protein are underweight, but this may go unnoticed as long as the child is not severely underweight – the child may just seem to be "slim". Many chronically undernourished children look fairly normally proportioned (not skinny), while in reality they are too short for their age. Only a comparison with a well-nourished child of the same age will reveal the difference.

Frequent signs which can be recognized by teachers are fatigue, lassitude, restlessness, irritability, frequent absences, and lack of concentration and attention. Since this kind of behaviour is often punished in schools, teachers need to be aware that it could indicate a real physical problem – they should be ready to convert their annoyance

into concern. It would be sad if children were reprimanded for being malnourished – and certainly completely ineffective!

FIGURE 7 Is this child malnourished or merely inattentive?

■ ACTIVITY 4 *Reforming A (optional)*

Malnourishment can be difficult to recognize. Children with severe malnutrition are probably not in school – they will be too weak to attend, or often sick. But there may be others who are suffering from mild malnutrition, or who are just beginning to show the effects. Teachers should look for these signs:

Learning behaviour
- lack of concentration;
- poor memory;
- difficulty understanding;
- skipping homework;
- falling behind with work.

Other behaviour
- frequent absences;
- shyness, unsociability;
- restlessness;
- irritability.

Once teachers are aware of potential problems, they can be sentinels and mediators and can alert other players – parents, community health workers and the children themselves. Raising teachers' awareness and making monitoring effective is something which individual schools need to explore, if there are real problems of malnutrition among its children.

■ ACTIVITY 5 *What's wrong with 'E'…? (Optional)*

KEY TEACHERS SHOULD BE SENSITIVE TO WARNING SIGNS.

TABLE 8 Conditions of malnutrition and their effects on learning

Condition	Clinical signs	Effects on education
Protein-energy malnutrition (PEM) Lack of food energy, protein and other nutrients	*Mild forms* of PEM are not apparent to everybody, but reveal themselves as low weight for height (wasting) and, if chronic or recurrent, in low height for age (stunting). *Severe forms* of PEM are marasmus (muscles extremely wasted) and kwashiorkor (pot belly, oedema, loss of hair, reddish hair, depigmentation of the skin, anaemia). Infectious diseases are often involved and aggravate the condition.	*in mild PEM*: fatigue, lassitude, attention deficit, poor memory, restlessness and irritability *in severe/chronic PEM*: failure to grow and thrive; impaired (fine) motor skills, learning capacity and mental functioning; high susceptibility to infections and frequent illness (absenteeism); poor school achievement
Short-term hunger Long gaps between meals temporarily reduce the body's energy supply.	None	Listlessness; lack of attention; easily distracted by irrelevant stimuli
Anaemia (iron deficiency)	Pallor of e.g. the inner eyelid and beneath the nails. Most common in females. Anaemia during pregnancy results in babies of low birth weight.	Tiredness and fatigue; breathlessness following even normal physical activities; learning difficulties; more risk of illness
Vitamin A deficiency (VAD)	Vitamin A is vital for good vision, hence VAD can result in night blindness and then total blindness. Occurs mainly in malnourished children, especially those with measles and oth er infections from which they suffer more often.	Poor vision in dim light; children are often sick, miss school and are lower-achieving.
Iodine deficiency	Lack of iodine results in goitre (enlargement of the thyroid gland); affects growth and can affect brain development; also higher risk of infection	Frequent illness; learning disabilities and problems in speaking (deaf-mutism). Subtle mental impairment is difficult to detect.
Vitamin B deficiency	Severe/chronic forms lead to muscular weakness, paralysis, mental confusion, nervous system disorders, digestive problems, cracked and scaly skin, severe anaemia and heart failure	Impaired motor control, pain in legs; learning difficulties; frequent absences
Overnutrition (overweight/obesity) More food energy is consumed than expended.	Excess body fat; high blood cholesterol and high blood pressure; increased chronic diseases in adulthood	Lack of interest and (if severe) difficulties with physical activity
Parasites, especially worm infections	Poor growth; diarrhoea and dehydration; reduced utilisation of nutrients in foods, hence nutrient deficiencies	Fatigue and weakness; poor school attendance.
Anorexia The child deliberately eats too little.	Significant weight loss	Low self-esteem and body image, feelings of inadequacy, anxiety, social dysfunction, depression, moodiness
Bulimia Compulsion to binge eat and then purge the body by self-induced vomiting or use of laxatives.	Same as Anorexia	Same as Anorexia

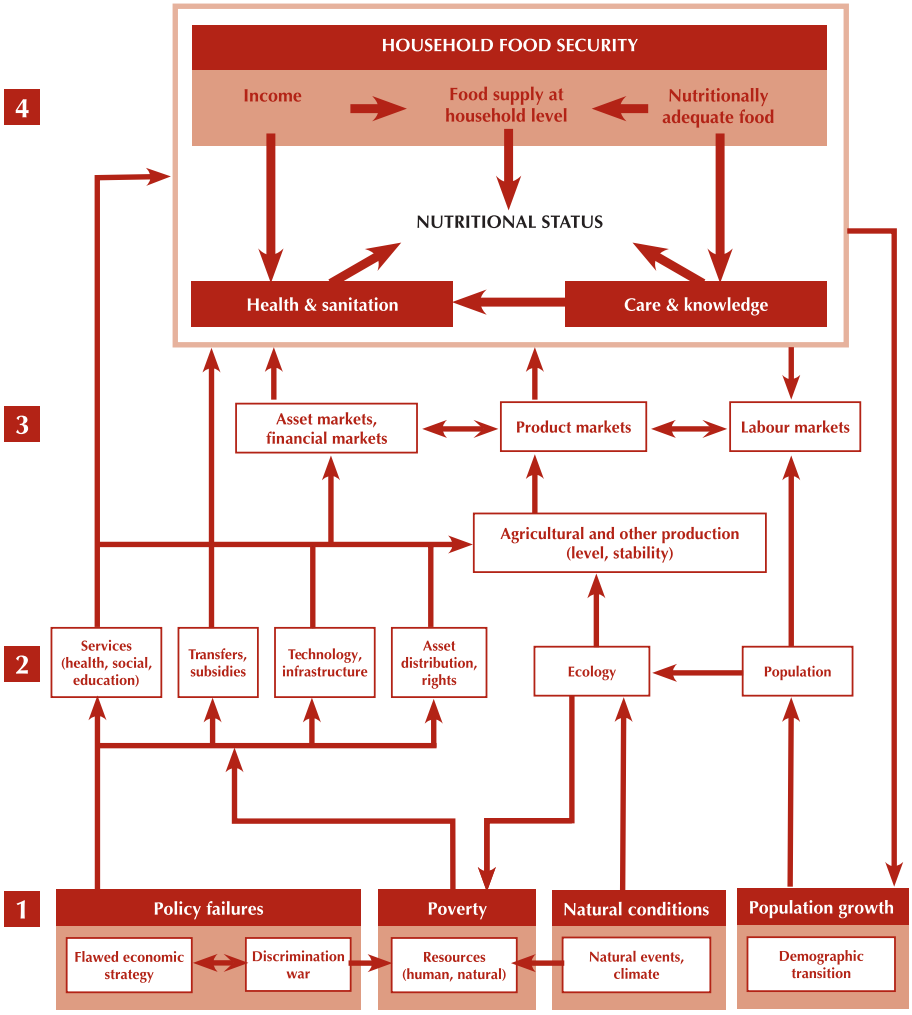
C THE CAUSES OF MALNUTRITION

▪ ACTIVITY 6 *The causes of malnutrition*

The causes of malnutrition seem to be very clear and simple: eating too little, or too much, or having an unbalanced diet that does not contain all the necessary nutrients.

But as soon as we look at the reasons why people don't eat enough food, or the right food, things become much more complex. "Non-food factors" are also involved in malnutrition, as well as factors which are beyond the control of individual households and people – such as national development policies, macroeconomic and agricultural policies. Figure 8 shows some of these, how they relate to each other, and how they affect the nutrition of an individual person.

FIGURE 8 Determinants of nutrition security: basic causes and links



Note: 1. Basic causes 2. Structural/institutional conditions, areas of public action 3. Market conditions 4. Micro-level conditions (household, intrahousehold, gender)

Source (adapted): FAO. 1996. Food security and nutrition. World Food Summit technical background document 5. p. 17. World Food Summit technical background documents, Vol 1. Rome

Poverty, of course, is involved in most cases of malnutrition, particularly in developing countries. Malnutrition primarily affects poor and deprived people who do not have adequate food, who live in unsanitary environments without enough clean water and basic services, and who lack access to education and information.

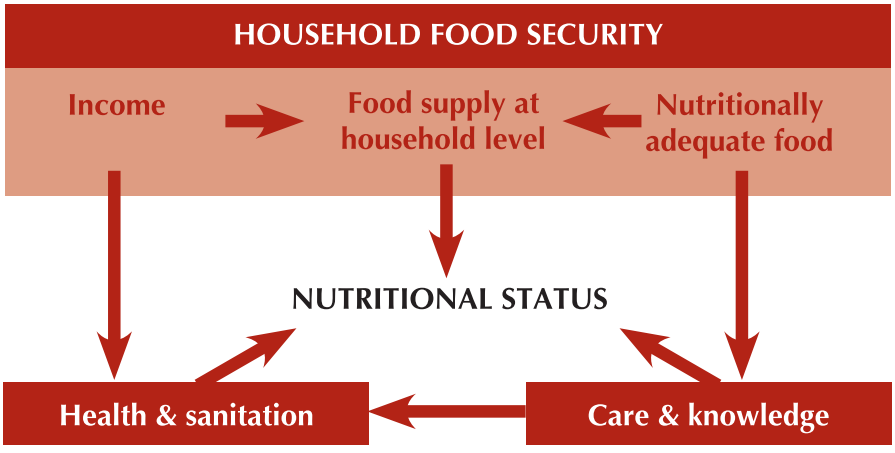
FAO Director-General's message on the occasion of World Food Day 2001
"**Fight hunger to reduce poverty**"
"World Food Day 2001 is not a day of celebration for everyone. Almost 800 million people in the developing world remain locked in a desperate cycle of hunger and poverty. To reduce those numbers I believe we must acknowledge the intricate connection between the two problems. While hunger is a consequence of poverty, the opposite is also true: hunger causes poverty.
·... I firmly believe that fighting hunger is our moral obligation. But I also contend that unless we ensure this most basic human right [to food], there can be no real and lasting progress in the struggle against poverty."

The factors which have the most direct influence on nutritional status are:

- household food security
- health
- knowledge and care.

These are set out in Figure 9. They are all essential to good nutritional status, and they often interact with each other.

FIGURE 9 Factors directly influencing nutritional status



Source (adapted): FAO. 1996. Food security and nutrition. World Food Summit technical background document 5. p. 17. World Food Summit technical background documents, Vol 1. Rome

Household food security

Obviously, the availability of adequate food is the cornerstone of nutritional well-being. But foods also need to be of good quality (nutritious), safe and culturally acceptable, and people must have access to them – by producing them or by buying them. Together these criteria make up the concept of *household food security* (HFS), which is defined as "access by all people at all times to the food needed for an active and healthy life" (FAO and WHO. 1992. Major issues for nutrition strategies – 1992. International Conference on Nutrition, Italy).

Health and sanitation

Various infectious diseases, in particular diarrhoeal and respiratory diseases, measles, malaria, intestinal parasites and HIV/AIDS, have a major impact on nutritional status. Poor sanitation multiplies the risk of disease considerably. A person suffering from an infectious disease in general has little appetite and tends to eat less. For people who are already malnourished this is a serious threat, as there are no body reserves to compensate. At the same time infectious diseases also increase the need for many nutrients, particularly protein, which is an essential element of the body's immune system. If there is diarrhoea, it means that nutrients are not absorbed exactly when they are needed most. Up to half the food eaten can be lost.

This is what is called the vicious circle of malnutrition-infection: infections aggravate malnutrition, and poor nutrition aggravates the infection. So dealing with malnutrition may also mean dealing with major endemic diseases. In its turn, this may mean dealing with poor sanitation and hygiene, which are major factors in the spread of infections.

Knowledge and care

Malnutrition can occur even in a household with an adequate income, adequate nutritious food, and access to sanitation and health services. In themselves these factors will not bring about improvements in nutrition unless households are able to take advantage of them. For this they need sufficient knowledge and the ability to care of vulnerable individuals.

Care consists of the time, attention and support provided in the community and in the household to meet the physical, mental and social needs of growing children and other family members. In the developing world this care is mainly provided by mothers and daughters rather than fathers. Care includes: understanding the differing nutritional needs of household members; making the right decisions about what foods to prepare and serve for each member; how much food to prepare.

The caregiver must also have enough time for child care, food preparation and child feeding. In many developing countries, women are the main household food producers and caregivers. They also have many other responsibilities, such as fetching water and fuelwood, and storing, processing and marketing food. During peak seasons of agricultural activity, when women are at work all day, there is often the danger that children's needs for care, proper food and frequent feeding will not be adequately met.

Knowledge matters too, and is related to established social practices and ideas of social status. Sometimes suitable foods are available but not consumed, because people do not recognize their food value – some excellent foods have low social status. The importance of variety and balance in the diet may be unknown: parents often think that if children feel full, they are well-fed. But they may be full of food of low nutritional value that is missing essential nutrients. On top of that, wherever there are scarce resources, there may be problems of distribution: often children and women come last in status and get the smallest share of the family food – with full social approval.

Nutrition security – the key to good nutrition for all of the household

It is clear that food security alone (availability and access to foods) is not enough. Food security will only lead to a good nutritional status if household members have nutrition security. This means:

- access to nutritionally adequate and safe food;
- sufficient "care" – that is, the knowledge, skills and time to acquire, prepare and consume a nutritionally adequate diet, including meeting the special needs of young children;
- access to health services and a healthy environment.

MALNUTRITION HAS MANY CAUSES.

D STRATEGIES FOR FIGHTING MALNUTRITION

1. Action by communities and individuals

Ideally, action to fight malnutrition should be taken in all areas and at all levels (national, community, household) at the same time. Several of the causes of malnutrition are beyond the immediate control of ordinary people, and this may create feelings of hopelessness. But there are many factors that can be influenced and tackled by individuals and communities. Actions which can be taken are those most directly linked to nutrition security – household food security, health, knowledge and care. For example:

Household food security

- In agricultural communities, *increased and diversified production of food* for the family to eat or sell is the first thing needed to improve household food security. Many other factors are necessary too – for example, sufficient water, extension advice, credit and good storage facilities.
- To have adequate food all the year round, households need *better home and community food processing, preservation and storage*. Small-scale agro-processing

industries can also significantly increase employment and income-generating opportunities.

- *Hygienic preparation and handling of food* are important to ensure that foods consumed are safe, which is crucial for preventing disease and helping children grow properly.

Health and sanitation

- To break the vicious circle of malnutrition-infection, it is necessary to *improve environmental health conditions* by tackling problems of contaminated water and insanitary disposal of human excreta and household wastes.
- *Access to health services* is vital, especially in rural areas, where controlling infectious diseases helps improve nutritional levels. Immunization against disease, medical treatment, antenatal services, oral rehydration, the effective promotion of breastfeeding, proper weaning and complementary feeding practices, the feeding of sick children and nutrition education, can all minimize the risk of undernutrition.

Knowledge and care

- Households can be helped *to care for their vulnerable members*. For example, technology can be used to reduce demands on women's time (e.g. through better access to water); income-generating opportunities and labour-saving technology can be provided for women, so as to improve their capacity to care for themselves and their families.
- *Women's status in society* can be improved by legislation and legal access to land and other productive resources.
- The whole community benefits from *better education* about the advantages of good nutrition and health. There are many other possibilities for community action such as establishing day care centres or encouraging the active participation of fathers in child care.

2. THE ROLE OF EDUCATION AND THE SCHOOL

▪ ACTIVITY 7 *The role of education*

As we saw earlier, the relationship between education and health is two-way. On the one hand nutrition and health status affect children's learning. On the other hand, learning can affect children's health and nutrition status.

Education may not have an immediate effect on poverty (although it certainly has a long-term one), but it can, for example:

- make a direct impact on hygiene behaviour;
- raise questions about social practices;

- introduce ideas about diversifying food production and conserving supplies;
- help with practical ideas about avoiding endemic illnesses and infections;
- reduce ignorance about eating and food practices and build an interest in healthy eating.

Apart from classroom education, what role do schools have to play in fighting malnutrition? It is absurd to imagine a classroom where malnourished children learn about good diet from teachers who are unaware of their problems. Yet this picture is not far from reality. Once schools have acknowledged a nutrition problem among their children, a number of actions must follow. Teachers must learn to be aware of the warning signs; health services must be consulted; families and the community must be involved in tackling the problem. In such a framework of conscious action, nutrition education has the best chance of achieving results.

E CONCLUSION

▪ ACTIVITY 8 *Summing up*

The causes of malnutrition are complex and interconnected, and so are the solutions. As we have seen, education is at the forefront of the battle – whether it is education of children, of their parents, of teachers and school staff, of governments, ministries and curriculum developers. All people want to eat well and be healthy, and they want their children to be well and strong. These are powerful motivations which can be enlisted on the side of education about healthy eating.

EDUCATION CAN FIGHT MALNUTRITION.