



Photo: International Federation

Food security and nutrition in emergencies

Description

The purpose of this chapter serves as a reference manual on the management of emergency nutrition field situations for humanitarian workers and medical professionals with limited nutrition training in emergencies. The chapter is also a reference manual for training staff on food security and emergency nutrition policies, guidelines, programme strategies, technical issues and best practices.

Learning objectives

- Recognising a food and nutrition emergency;
- Targeting and equitably distributing an adequate quality and quantity of food aid;
- Key emergency nutrition interventions such as therapeutic feeding and vitamin A supplementation;
- Monitoring the adequacy of the food aid and emergency nutrition response and nutrition surveillance.

Key Competencies

- Use of nutrition surveillance as part of early warning and for benchmarking;
- Use of standard methods to conduct a population nutrition survey to assess acute and severe malnutrition;
- Management of the food aid logistics, targeting and the equitable distribution of an adequate general food ration;
- Vitamin A supplementation in a nutrition emergency;
- When and how to implement supplementary food distribution;
- Treatment of severe acute malnutrition and operation of therapeutic and supplementary feeding centres;
- Treatment of severe anaemia;
- Monitoring and evaluation of food aid and nutrition interventions.

Introduction

Every man, woman and child has the inalienable right to be free from hunger.

(First World Food Conference Declaration, Rome, 1974)

Eradicate extreme poverty and hunger.

(First Millennium Goal, UN, 2000)

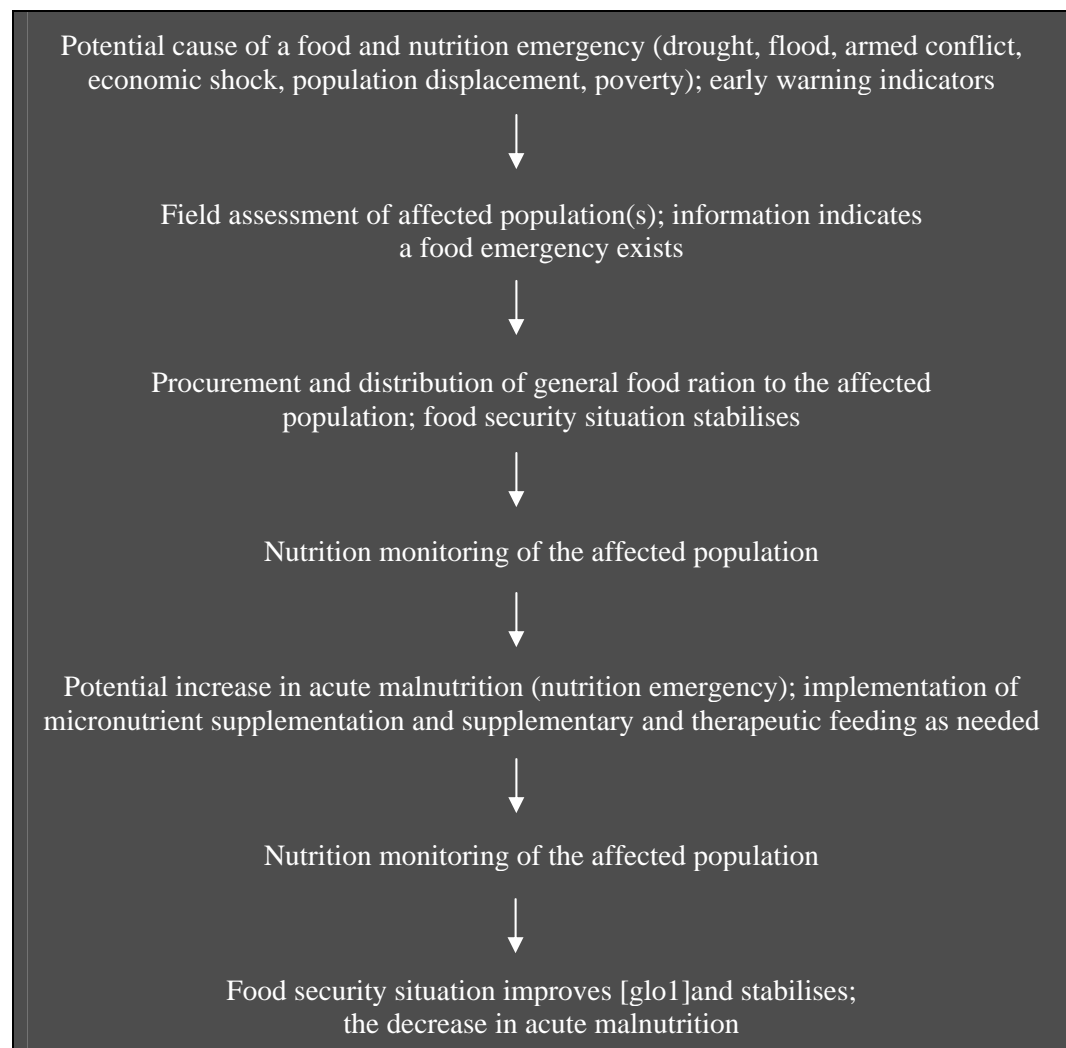
Household food security exists when the household has at all times physical and economic access to sufficient, safe and nutritious food for a healthy and active life; the

diet is adequate in both quality and quantity, providing the required amounts of energy, macronutrients (carbohydrates, protein, fats) and micronutrients (vitamins, minerals, electrolytes) and the special needs of infants and young children are met.

The right to adequate food is recognised in international legal instruments including declarations, which are nonbinding and conventions, which are treaties that carry the force of the law. The Convention on the Elimination of All Forms of Discrimination against Women in 1979 and the Convention on the Rights of the Child in 1989 state that states and non-state actors have responsibilities in fulfilling the right to food. While it is first and foremost the duty of individuals to find their own solutions to feeding themselves, it is the state's obligation to respect the freedom of individuals in realizing and protect their rights. Refugees and displaced people have the same human right to food as do non-refugees. Deliberate starvation or destruction of livelihoods such as production of crops and livestock as a war strategy is a violation of international law. Marginalised populations are vulnerable to food insecurity because of poverty. If the actions of individuals and of the state fail, the state must proactively take action, which might be economic support or the provision of direct food aid as a last resort to those who are unable to feed themselves.

The UN Millennium Development Goals elaborated in 2000 represent a commitment by all the 189 member states to reduce global deprivation and abuse of human rights. Poverty and hunger are perpetuated by economic and food insecurity all of which increase the vulnerability of populations to food and nutrition emergencies.

Figure 9-1 - Stages of a food and nutrition emergency



Causes of food and nutrition emergencies

Access to food and adequate nutrition is critical to survival in an emergency situation. Malnutrition can be the most serious public health problem in an emergency. A food emergency exists if depleted food supplies are not replaced in the short term by food aid. A **famine** occurs in a population whose food consumption is reduced to the extent that the population becomes acutely malnourished and there is a rise in mortality. A **nutrition emergency** exists when there is the risk of or an actual rise in mortality due to acute malnutrition. A **complex emergency** is an internal crisis in the state where the capacity to sustain livelihood and life is threatened by primarily political factors and, in particular, high levels of violence. In complex emergencies, the focus is typically short term in response to changing circumstances such as movements of armies and bandits.

Food and nutrition insecurity result from the following:

- A natural disaster due to climatic or other environmental conditions such as drought, flooding, major storms or insect infestation such as locusts; global warming might also contribute to an increase in droughts and floods;
- Armed conflict, war or political upheaval;
- Disruption or collapse of the food distribution network and/or the marketing system of a population. This might be the result of an environmental, political or economic crisis;
- Lack or disruption of the provision of emergency food distribution to a population experiencing a food shortage;
- HIV/AIDS;
- Extreme poverty of marginalised populations e.g. the elderly and urban slum populations who have poor access to water, sanitation, health care and livelihoods.

A **drought** is any unusual, prolonged dry period that reduces soil moisture and water supplies below the minimum level necessary for sustaining plant, animal and human life. Droughts occur because of low, sporadic or late rainfall and as a result of human activities such as deforestation, overgrazing by livestock, erosion, lack of soil conservation, reliance on the cultivation of single cash crops and traditional farming methods such as slash and burn.

The effects of drought are as follows:

- Overtaxing and drying up of water supplies resulting in the loss of crops, livestock and the lack of drinking water and water for washing and bathing;
- Crop failure, the depletion of food stocks and grazing for livestock causing temporary migration of families to areas with more pasture for remaining livestock or to cities for alternative sources of income. Livestock are susceptible to heat stress and drought.

Prolonged and repeated droughts may result in permanent changes in settlement, social and living patterns and major ecological changes, e.g., desertification, flash floods and soil erosion.

Most scientists agree that global warming because of increased emission of what are known as greenhouse gases is occurring. Greenhouse gases such as carbon dioxide from car exhaust and other gases from industrial plants and agricultural activities trap heat close to the earth's surface. The effect of global warming is an increase in extreme erratic weather and a rise in sea level leading to coastal erosion. Large-scale changes in rainfall and rainfall distribution will increase the risk in the subtropics of both droughts and floods because it will rain harder when it does rain.

Increasingly however, the main cause of food emergencies is armed conflict, not natural disaster.^{AA} Food emergencies due to violent conflict occur when civilian populations flee and/or are cut off from food markets and humanitarian aid or by the deliberate destruction of crops or livestock. Conflicts can create famine by leading to the following:

- Disruption of the agricultural cycle;
- Displacement of farmers from the land;
- Interference in the market;
- Destruction of food stocks and harvests;
- Creation of food shortages that drive prices up to levels that low-income households cannot afford;
- Reducing physical access to displaced populations.

Africa has been home to a disproportionate share of the world's emergencies and has suffered a disproportionate burden of the world's famine-related mortality. Major armed conflict occurred in seventeen countries in Africa during the period 1990 to 2003. Africa, where the prevalence of underweight among children under the age of five is the highest in the world, is especially vulnerable to nutrition emergencies.^B When a food emergency occurs, malnutrition, the resilience of livelihoods and household food insecurity to some extent predict the severity of the ensuing nutrition emergency and the ability of households to recover.

HIV/AIDS and household food security

HIV/AIDS among otherwise productive adult members of the household puts a household at high risk of food insecurity. Like households exposed to other food security shocks, households affected by HIV/AIDS resort to coping strategies. When a household income earner becomes too sick to work, the household may be forced to develop knowledge,

skills, assets and activities required for a new livelihood so that the household has access to food or income to buy food. Other family members—often grandparents or children—must compensate for the lost income and care for the sick family member. Savings and assets may be depleted while medical costs rise. Children may lose one or both parent and no longer attend school. Orphans might become dependent on other households for their food and survival. Local institutions and traditions are overburdened and break down e.g. food sharing, giving alms, lending money and adopting children—when so many households in one community are affected.

Like high levels of chronic malnutrition, widespread HIV/AIDS is an underlying factor

that predicts the severity of an ensuing nutrition emergency for populations affected by HIV/AIDS as well as many households. When so many households in a community are affected, HIV/AIDS erodes institutions and traditions normally employed to mitigate food security shocks. Unlike other food security shocks, the effects of HIV/AIDS on the



*Investment in increasing agricultural productivity and reducing the vulnerability of livelihoods a vital part of the fight against hunger and poverty.
Photo: Yoshi Shimizu / International Federation*

^A Natural disasters (mainly drought) were the main cause of 80% of food emergencies that occurred during the period 1986–1991 and the main cause of less than 60% during the period 1992–2003. Conflict and economic crises (mainly conflict) were the main cause of less than 20% of food emergencies during the period 1986–1991 and almost 40% of those that occurred during the period 1992–2003.

^B During the period 1990–2005 the number of underweight children decreased in all regions except Africa; the prevalence of underweight children under five years of age is 24% in Africa (30.6% in East Africa).

household are permanent affecting long-term household food security, nutrition, health care and especially the support that is crucial for recovery.

Drought has been the cause of repeated food and nutrition emergencies in the Horn of Africa in 2000, 2002 to 2003 and 2005 to 2006.

In 2004, tropical storm Jeanne caused dangerous flooding and a food and nutrition [glo2] emergency in the Gonaives area of Haiti.

Flooding, civil strife and economic factors, as well as HIV/AIDS as an underlying factor caused the food and nutrition crisis that affected southern [glo3] Africa in 2001-2002.

Population displacement

Refugees and Internally Displaced Persons (IDPs) have a high risk of becoming malnourished because they are cut off from their land and are restricted from cultivating crops and producing food in the areas to which they flee nor can they find a means of livelihood in urban areas. Millions of people throughout the world are displaced (Table 9-1). Within the UN system, humanitarian assistance to refugees is the specific mandate of UNHCR.

Humanitarian assistance and food aid distribution sometimes encourages population displacement and leads to large refugee settlements with high population densities, where the risk of disease epidemics with high levels of mortality is higher than in smaller camps. Whenever possible, assistance with strong referral networks should be provided to populations before they become displaced or to their camps if they are already displaced. Where people have been displaced, the food security of the host population must also be taken into account.

Table 9-1: Countries with 500,000 or more IDPs (2004 estimates)²⁸

Country	Number of displaced persons (millions)
Sudan	4.0
Democratic Republic of the Congo	3.4
Colombia	3.1
Uganda	1.6
Turkey	1.0
Algeria	1.0
Myanmar	0.6-1.0
Iraq	0.9
Côte d'Ivoire	0.5-0.8
India	0.7
Azerbaijan	0.6
Indonesia	0.5
Bangladesh	0.2-0.5
Liberia	0.5
Sri Lanka	0.4-0.5
Syrian Arab Republic	0.2-0.5

Mortality rates

Malnutrition, even being mildly underweight, is associated with increased under-five mortality. WHO estimates that malnutrition is an underlying cause in more than half of all under-five child deaths. The biggest killer in emergencies is child malnutrition that is either recorded as a direct or as an underlying cause of death.

In a nutrition emergency where the prevalence of **acute malnutrition** among young children might be 10% to 15% and of **severe malnutrition**, 2% to 3%, mortality rates can be very high. Elevated **crude mortality** and **under-five mortality** rates are benchmarks for and definitions of a nutrition emergency (Table 9-2). Survival is at risk not only because of an inadequate and/or unbalanced diet but also because of disease outbreaks such as measles, TB, malaria, diarrhoeal diseases, HIV/AIDS and respiratory infections resulting in high death rates in the affected population. There is a strong relationship between malnutrition and fatality due to these infections. Vitamin A deficiency e.g. increases the duration, severity and complications of diarrhoeal disease in young children.

Mortality rates of displaced populations can be as high as ten times the death rates for the same populations in non-emergencies. These extraordinarily high mortality rates have been observed during the first few months after displaced people had arrive in camps. Peak mortality generally occurs some months into the emergency.

In August 2004 in the refugee camps for Sudanese in eastern Chad, there was a large diarrhoea outbreak in the largest refugee camp (Bredjing) and a hepatitis E outbreak in the refugee camps in the south (Goz Amir and Djabal).

Table 9-2: Benchmarks for mortality rates¹⁷

Crude mortality rate (deaths/10,000/day)	Under-five mortality rate (deaths/10,000/day)	Health and nutrition situation
0.5	1	Normal
<1	<2	Elevated
1-2	2-4	Serious
>2	>4	Very serious
>5	>10	Catastrophic

Field assessment

Monitoring and evaluation is looked at in depth in the epidemiology section of this book; however, some concepts specific to food and nutrition are covered here.

Early warning and nutrition surveillance

Early warning consists of simple, predictive indicators or benchmarks to alert authorities to impending interruptions in food supply and/or food access. Possible early warning indicators include reduced rainfall, loss of livestock, deficit food production, food shortages, infestation of food crops, significantly increased grain prices, market demand for food, epidemics, population displacement and indicators of household food insecurity e.g. reduced diet diversity (number and frequency of consumption of different foods), increasing percentage of household expenditures on food, loss of employment, temporary work, loans from family/friends, early sale of crops and migration to look for work or flee insecurity. When some of these indicators are identified, emergency preparedness measures, such as. prepositioning of emergency food and trained staff to reduce the lead

time required to avert a severe and/or large-scale food and nutrition emergency can be started.

For example, in a drought situation, decreased rainfall followed by a decline in food supply and an increase in food prices are early warning signs of a food emergency. Families might cope by selling their household assets such as livestock and tools to buy grain. Selling critical household assets can eventually lead to a loss of livelihood and displacement.

Nutrition surveillance, the collection of nutrition data for the purpose of taking timely action as needed, is also part of early warning system. Anthropometric indicators of acute and severe malnutrition, however, are late indicators of a nutrition emergency. Therefore, anthropometric indicators are *not* used to predict a nutrition emergency nor to avert excess mortality due to acute malnutrition. This is because the lead time needed to implement emergency food aid before it is effective might be too short to avert excess mortality. However, rates of acute malnutrition are frequently used as critical levels of indicators for taking action or as benchmarks (Table 9.3).

Growth monitoring data are generally not used for nutrition surveillance, but can be used as a source of information during local field assessments when looking for an increase in cases of severe malnutrition at health centres. Growth monitoring is used primarily for individual screening and assessment.

During the food and nutrition emergency in Ethiopia in 2002-2003, geographic gaps in nutrition surveys early in the emergency missed the developing emergency in one region of the country (SNNPRJ).

Table 9-3: Nutrition surveillance benchmarks⁴²

Nutrition situation	Recommended actions
Acute malnutrition rate >15% or 10-14% with aggravating factors*	Emergency food aid: general food ration Blanket supplementary feeding Therapeutic feeding of severely malnourished individuals
Acute malnutrition rate 10-14% or 5-9% with aggravating factors*	No general rations Targeted supplementary feeding Therapeutic feeding of severely malnourished
Acute malnutrition rate <10% with no aggravating factors	No emergency food and nutrition intervention

*Aggravating factors include the following:⁴²

- Household food insecurity;
- High prevalence of HIV/AIDS;
- Crude mortality rate greater than 1/10,000/day;
- Under-five crude mortality rate greater than 2/10,000/day;
- Epidemic of measles or whooping cough (pertussis);
- High prevalence of respiratory or diarrhoeal diseases;
- High prevalence of pre-existing malnutrition, e.g., stunting.

Local assessment

The planning for an emergency food and nutrition response begins with a local field assessment. Assessments are covered in detail in the epidemiology chapter of this book; however, there are a few items that are related only to nutrition assessments addressed here.

The purpose of a local food and nutrition assessment is as follows:

- To determine whether an emergency food and nutrition problem exists, including the cause(s) and the magnitude of the emergency (severity of malnutrition, geographic extent and size of the affected population);
- To provide recommendations for a course of action to reduce or prevent a food and nutrition emergency based on consideration of the available data and field observations;
- To communicate this information to the concerned decision makers and government authorities, both local and national;
- To assess local capacity and the capacity of other organisations such as Non-Governmental Organisations (NGOs) and UN agencies (technical resources, infrastructure) to respond.

Local assessment includes assessment of household livelihoods, food security, water supply, sanitation, health care and child feeding practices, the latter as part of a nutrition survey if data are unavailable. Table 9.4 is a data collection checklist.

As noted in the epidemiology chapter, the field visit should involve local travel, observations and interviews. Sources of information include community leaders, local government officials and representatives of key civil society organisations e.g. local NGOs, peasant associations, women's groups and religious groups. Individuals from the affected population, including women because of their central role in providing food for the family and taking care of children, should be involved in the field assessment as well as the planning of the emergency response as much as possible.

Visits should be made to health centres and food distribution points to look for and ask about cases of malnutrition, kwashiorkor and marasmus. Observation of an unusual high number of cases of severe malnutrition indicates that a food and nutrition emergency might be underway.

The assessment report should include the following:

- The geographic area, including normal harvest and rainy seasons (if applicable) and population groups and sizes;
- Major livelihood groups and food security situation of each group (food production, livestock and/or sources of income);
- Health and nutrition findings;
- Determination of whether an emergency exists based on findings. This is a qualitative judgment based on the preponderance of the evidence;
- International, national and local capacity to provide food aid and nutrition support;
- Any information gaps.

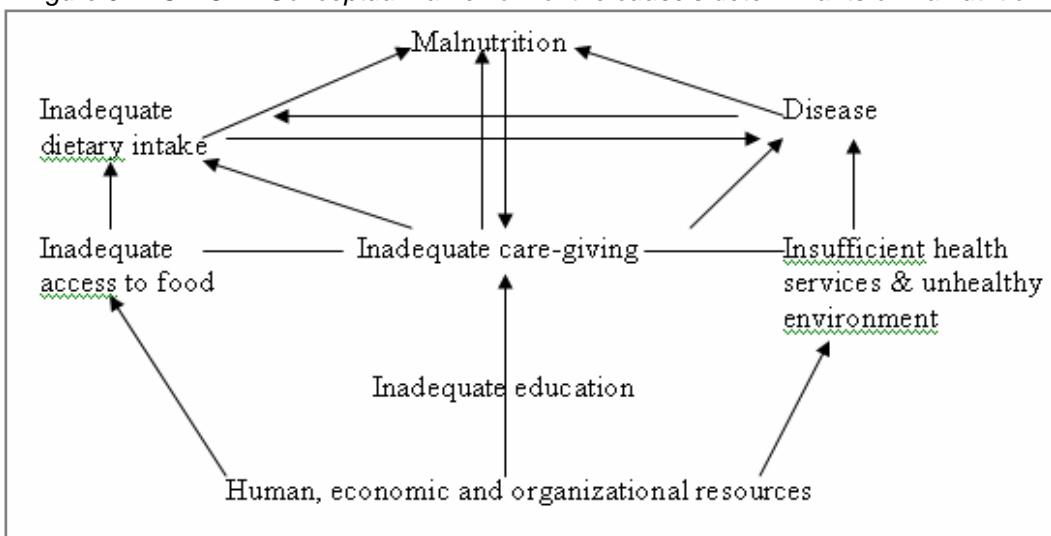


Floods in Mexico - Here, aid for 2,000 families had to be flown in. Air lifts like this one have helped sustain nearly 300,000 people with food parcels. Photo: Miguel Rodriguez/Mexican Red Cross

Table 9-4: Local field assessment data collection checklist⁴²

Food security of major livelihood groups	Population health and nutrition status
<ul style="list-style-type: none"> ▪ Rumours of famine (yes/no) ▪ Drought or flooding (yes/no) ▪ Major pests causing crop failure (yes/no) ▪ Pre-harvest 'hungry' season (yes/no) ▪ Declining food stocks at household, district and/or national levels (yes/no) ▪ Unusual rise of market prices (yes/no) ▪ Loss of livestock (yes/no) ▪ Loss of livelihood (yes/no) ▪ Increased sale of household assets, livestock or wood for food acquisition (yes/no) ▪ Population displacement to cities/loss of productive land (yes/no) ▪ Degree of poverty (esp. in urban centres) 	<ul style="list-style-type: none"> ▪ Frequent observation of adult wasting or kwashiorkor and/or marasmus among children (yes/no) ▪ Reports of increased mortality (yes/no) ▪ Epidemic and endemic diseases such as diarrhoeal diseases and malaria ▪ High prevalence of HIV/AIDS ▪ Prevalence of anaemia ▪ Coverage and access to health services (including payments etc) ▪ Immunisation coverage ▪ Vitamin A supplementation coverage if vitamin A deficiency is endemic in the population ▪ Availability of water and access to potable drinking water and sanitation ▪ Infant and young child feeding practices ▪ Hospitalisations due to AIDS
<p>Local capacity</p> <ul style="list-style-type: none"> ▪ Presence of government, NGOs, UN agencies ▪ Accessibility and managerial infrastructure: roads, warehouses, hospitals ▪ Communication and coordination 	<p>Security situation</p> <ul style="list-style-type: none"> ▪ Armed conflict or civil violence (yes/no) ▪ Banditry (yes/no) ▪ Population displacement (yes/no)

Figure 9-2 shows that nutritional status is determined by immediate, underlying and basic factors. It can be used for a situation analysis of the causes of malnutrition and food intake. Immediate determinants are dietary intake and infections.^c Underlying factors are care giving practices, household food security and access to health care services, water and sanitation and basic causes are political and economic contextual factors.

Figure 9-2: UNICEF Conceptual framework of the cause's determinants of malnutrition³⁴

^c Dietary intake includes intake of macronutrients (carbohydrates, protein and fat) and micronutrients (vitamins and minerals). . . . Macronutrients provide energy and amino acids for synthesis of body proteins. Micronutrients are needed for the normal functioning of the body, including growth, physical activity, development and immunity/protection against disease.

Malnutrition, kwashiorkor and marasmus

The term malnutrition refers to the consequences of a combination of inadequate dietary intake and disease as shown in Figure 9.2.^D The consequences of inadequate dietary intake and disease are particularly pronounced during periods of rapid growth under the age of five. Among children, malnutrition is manifested by underweight and growth failure: malnourished children are shorter or stunted and thinner or wasted than they should be for their age. Among adults, acute malnutrition is manifested by underweight.^E

Child underweight (measured by low weight-for-age) is a combination of stunting (measured by low height-for-age) and wasting (measured by low weight-for-height). Stunting is an indicator of chronic malnutrition. Underweight and wasting are indicators of acute malnutrition. Acute malnutrition among children is defined as weight-for-height of less than two standard deviations of the reference population median weight-for-height.

Marasmus or severe wasting is one of two forms of severe acute malnutrition. Marasmus is defined as a weight-for-height of less than three standard deviations of the reference population median weight-for-height. **Kwashiorkor** is the second form of severe acute malnutrition. It is defined by the presence of bilateral oedema of the both feet. Children who have kwashiorkor may not appear underweight initially because of their oedema. Clinical signs of marasmus and kwashiorkor are given in Table 9-5.

Table 9-5: Signs of severe forms of acute malnutrition⁴³

Type of severe acute malnutrition	Clinical signs
Marasmus	Extreme wasting, little fat or muscle, child's skeleton clearly visible, lack of appetite in complicated cases.
Kwashiorkor	Oedema of both feet; thin, sparse and pale hair that falls out easily, dry scaly skin especially on the arms and legs, a puffy or moon face, apathy.



- Complicated and uncomplicated cases are described in the Therapeutic Feeding Protocol and under Community Therapeutic Care.
- The thumb is pressed gently for a few seconds on the top side of each foot; if a dent remains when the thumb is removed, the child has oedema.

When one speaks of malnutrition during a food and nutrition emergency, people are generally referring to rates of wasting/acute malnutrition and severe malnutrition. However, malnutrition during an emergency encompasses micronutrient deficiencies and stunting/chronic malnutrition as well as acute malnutrition.

In non-emergency situations in developing countries, the prevalence of acute malnutrition/wasting in children under five is about 5% with only sporadic cases of severe acute malnutrition. In a nutrition emergency, the prevalence of acute malnutrition and of severe malnutrition increases significantly; **the prevalence of acute malnutrition, including severe acute malnutrition, can be 10% to 15% among**

Kwashiorkor, characterised by moon face and scarce, pale hair
Photo: J Pierre-Louis, UNHCR, 2004.

^D Dietary intake includes intake of macronutrients (carbohydrates, protein and fat) and micronutrients (vitamins and minerals). . . . Macronutrients provide energy and amino acids for synthesis of body proteins.... Micronutrients are needed for the normal functioning of the body, including growth, physical activity, development and immunity/protection against disease.

^E Defined as a Body Mass Index (kg/m²) of less than 18.5

children under five; the prevalence of severe malnutrition may be as high as 2% to 3% among children under five^F. Older children, adolescents, adults and the elderly can also be acutely malnourished, but are less likely to show wasting to the extent that young children do.

High rates of chronic malnutrition or stunting and underweight in children under five in the affected population before the emergency indicate a high level of pre-existing malnutrition and greater vulnerability to acute malnutrition and risk of mortality. Severe malnutrition will be more prevalent and lead to higher death rates if the affected population had high rates of malnutrition before the onset of the emergency e.g. high levels of stunting and/or vitamin A deficiency.

Pregnant women are also vulnerable to acute malnutrition. Maternal underweight is a risk factor for low birth weight and increases the risks of maternal mortality.

Nutrition surveys

A nutrition survey, a cornerstone of nutrition surveillance, can either precede or follow a local field assessment.

The purpose of nutrition survey findings is to:

- Identify emergency affected populations and confirm the occurrence of a food and nutrition emergency. If it precedes a local field assessment, it can signal a food and nutrition emergency. If it follows a local field assessment, it can confirm a food and nutrition emergency;
- Estimate the number of malnourished individuals, the kind of malnutrition and target the most vulnerable populations for intervention. It is essential to standardise nutrition survey methods so that findings can be compared to findings of surveys in other areas and over time (see Tables 9-6 and 9-7);
- Monitor the adequacy of food and nutrition emergency interventions and improvement in the nutritional status of the affected population. The first survey in an area can be used as a baseline.

The **survey report** should present the acute malnutrition rate, the severe acute malnutrition rate and the prevalence of kwashiorkor in order to discuss the real situation about household food security, public health, child feeding practices and humanitarian assistance based on the information collected during the local field assessment. The findings should be communicated as soon as possible to both local and national authorities.

Weight and height are used to assess malnutrition in both individuals and populations. Acute malnutrition rates in children six to fifty-nine months of age are used as an **indicator of nutritional status** of the target population. Survey data should be collected from a representative, cross-sectional population sample of households with children six to fifty-nine months of age. If a child's age is unknown, the cut-off for inclusion in the survey is a height of 110 cm. Training and supervision is needed to ensure accurate and reliable measurements. The weights and heights or lengths of all children in the target age group in the households sampled are measured.^G



Marasmus, severe wasting of body fat and muscle
Photo: J Pierre-Louis, UNHCR, 2004

^F The term, global acute malnutrition or GAM, is sometimes used. . . . It includes both acute malnutrition and severe malnutrition.

^G The height of children age twenty-four to fifty-nine months (or 85 cm or greater) is measured. . . . The length of children under twenty-four months or less than 85 cm is measured. . . . Height is measured with the child standing up and length is measured with the child lying down.

Table 9-6: Standard height/length and weight measurements of children under five

Measurement	Procedure
Length	For children less than 85 cm or two years of age, length is measured. The measuring board is placed on the ground with the child lying in the middle. An assistant holds the child's head and positions it to touch the headboard. The measurer places his hands on the child's legs and gently stretches the child, keeping one hand on the child's feet. The foot plate must be perpendicular to the board when the measurement is read. Length is measured to the nearest 0.1 cm.
Height	For children greater than 85 cm or two years of age, height is measured. The measuring board is placed upright on level ground. The child stands upright against the measuring board. The child's head, shoulders, buttocks, knees and heels should touch the backboard while the measurer places the headboard firmly on the child's head. The child's line of sight should be straight ahead. Height is measured to the nearest 0.1 cm.
Weight	A 25-kg hanging Salter scale is generally used. Weighing pants are suspended from the lower hook and the scale is adjusted to zero. The child's clothes should be removed and the child placed in the weighing pants and then hung freely from the hook. When the child is still, the weight is recorded to the nearest 100 g with the scale at eye level. If the child is moving, the weight can be estimated at the midpoint of the range of oscillations.

Weight-for-height, as an indicator of acute malnutrition or wasting in children from six months to five years of age, is compared to international reference standards and expressed as a z score. **Weight-for-height z score** is the weight of the child compared to the median and standard deviation of the reference weight for the child's height.^H Weight-for-height z scores can be calculated by hand or by using a statistical programme such as Epi Info.

Z scores are used to present survey data while **percentage of the reference standard** is used for assessing individual children for admission and discharge from therapeutic or supplementary feeding.

For the assessment of a population's nutritional status in an emergency situation, other anthropometric indicators such as height-for-age z score (an indicator of stunting or chronic malnutrition) and weight-for-age z score, which is an indicator of underweight that conflates stunting and wasting, are neither needed nor recommended. For both of these standard indicators, accurate determination of the child's age is required, which can be difficult to determine because birth registration is not universal in some populations.

New WHO standards for length/height-for-age, weight-for-age and weight-for-length/height are now in use and replace the earlier WHO/National Centre for Health Statistics reference standards used since the 1970s. The new standards are based on the growth of healthy children living in Brazil, Ghana, India, Norway, Oman and the United States under conditions likely to favour their full genetic growth potential, including exclusive breastfeeding. The reference standards are available at <http://www.who.int/childgrowth/standards/en/>.

^H Anthropometric indices can be expressed as:

$$\text{Percent of reference \% WFH} = \frac{\text{weight}}{\text{median reference weight-for-height}} \times 100$$

$$\text{Standardised weight- For-height or z score} = \frac{(\text{weight} - \text{median reference weight-for-height})}{\text{standard deviation of reference weight-for-height}}$$

In addition to measurement of weight and height, cases of kwashiorkor and vitamin A or iron deficiency on the basis of clinical observations observed in the sample population should be noted.

Other age and gender groups at nutritional risk e.g. **breastfeeding women or the elderly** can also be included in the survey if there is reason to believe that these groups are at high risk and if specific interventions for instance, supplementary feeding is planned for these groups. **Body Mass Index (BMI)** is used for measuring acute malnutrition in adults.¹ An adult BMI less than sixteen indicates severe wasting.

Low birth weight which is a birth weight under 2.5 kg can indicate maternal underweight before and during pregnancy as well as an increased risk of infant mortality. Accurate and objective data on birth weight is difficult to obtain when a significant proportion of births takes place in the home. Low-birth-weight data from maternity records also tend to give a biased estimation of low-birth-weight prevalence. If birth weight data is collected, its prevalence should be estimated for live births during the preceding twelve months. Low birth weight can be estimated by asking a new mother whether her last newborn was big, average or thin.



*A child is weighed to check for malnutrition at a mobile clinic at the Red Cross camp in Tahoua, Niger.
Photo: Bruce Liron/British Red Cross*

Mid-Upper-Arm Circumference (MUAC), which measures fat and muscle in the mid-upper arm, is sometimes used for rapid assessments and screening for therapeutic feeding of individuals. MUAC of the left arm should be measured. For children, a cut-off value of <12.5 cm should be used for children under five to indicate acute malnutrition and referral for further evaluation. For pregnant and breastfeeding mothers, the cut-off value is 22 cm. Measurement of Mid-Upper-Arm Circumference is prone to measurement error and inaccurate assessment of nutritional status and therefore it is not recommended for nutrition surveys.¹

Standard **sampling methods** are described in Table 9-7. A cluster sample of 900 children is generally used (thirty clusters and thirty children per cluster). Sample clusters are selected by proportional-to-population sampling and a random sample of thirty households is selected in each sample cluster.

¹ If BMI is used for unusually tall populations, height measurements should be corrected for sitting height by measuring sitting height in a sub-sample of the target population.

¹ MUAC is taken on the left arm with the arm hanging down the side of the body and relaxed. . . . MUAC is measured at the mid-point between the shoulder and the tip of the elbow. . . .

Table 9-7: Standard survey sampling methods⁴

Sampling method	Description
Cluster sampling	Clusters of the population such as communities or neighbourhoods are selected and sample households and children within the cluster are selected for the survey.
Population proportional to size sampling	Clusters and population sizes are listed with cumulative population sizes in a third column. The total cumulative population size is divided by 30 to get n. A number between 1 and n is randomly selected and the cluster with the cumulative population closest to this number is selected. Add n to the random number and select the second cluster closest to but not exceeding the sum of n and the random number. Continue in this manner until 30 clusters have been selected.
Random sampling	A random starting point is selected in each cluster and every household with children under five is visited, moving in a randomly selected direction.

Estimating mortality rates

Nutrition surveys are sometimes used to collect data on mortality rates. For children under five, the following standardised questions in interviews of caregivers can be used:

- Have you ever given birth?
- (If yes) When was your most recent birth?
- (If less than five years ago) Where is this child now?
- (If dead) Did this child die before or after the start of (the emergency period)?

An under-five crude mortality rate greater than 2/10,000/day is elevated and cause for concern.

Infant and young child feeding practices

Nutrition surveys are also used to collect information on infant and young child feeding practices. Standard indicators are described in Table 9-8.

Table 9-8: Standard indicators of infant and young child feeding practices^{43,50}

Indicator	Question
Exclusive breastfeeding rate, less than six months	'What did the child eat yesterday?' Interviewer: Exclusive breastfeeding is breast milk and medicine only; no water or teas. Use a checklist of frequently consumed foods including breast milk.
Complementary feeding rate, six to eight months	'What did the child eat yesterday?' Interviewer: Complementary feeding includes breast milk and other liquids and semisolid and solid foods. Use a checklist of frequently consumed foods including breast milk.
Breastfeeding rate, twenty to twenty-three months	'What did the child eat yesterday?' Interviewer: Use a checklist of frequently consumed foods including breast milk.

Indicator	Question
Percentage of children consuming the recommended number of meals and snacks per day, six to twenty-three months	'What did the child eat yesterday?' Interviewer: Besides breastfeeding, note the number of times the child was fed.
Percentage of children sick in the past two weeks who continued breastfeeding and feeding foods other than breast milk	'Was the child ill in the past two weeks?' Interviewer: If yes, ask, 'Did the child breastfeed more, less or the same?' 'Did the child eat more, less or the same amount of other foods?'

A national coordinating body in Ethiopia oversees and ensures the implementation of emergency nutrition surveys using standardised methods. The survey findings conducted by NGOs throughout the country are compiled at the national level and incorporated into a national nutrition surveillance system.

Emergency food aid response

General food ration distributions should be introduced only when absolutely necessary, targeted to those most in need but discontinued as soon as possible. The aim of the emergency food aid response is to deliver timely an adequate quantity and quality of food to the affected population to reduce the risk of acute malnutrition and mortality so that communities, households and individuals can survive and recover from the emergency situation. Implementing adequate food aid early in combination with public health measures will maintain the nutritional status of the affected population.

General Food Ration (GFR)

The aims of the General Food Ration are:

- To ensure that emergency affected populations have adequate food intakes; and
- To reduce the risk of acute malnutrition and mortality.

GFR bridges the gap between the population's requirements and their own food resources from market trading, wage labour, garden plots, community sharing, food stocks, small livestock etc. The same ration is given to every member of the household regardless of age or individual need.

The **food basket** for the GFR consists of food commodities in sufficient quantities to meet a family's basic nutritional requirements and provide a buffer against shortages or spoilage. Adequate fuel, cooking utensils, mills and other grinding facilities must also be available to assisted households and communities.

Some **bartering and trading** of food aid and sale of small livestock to the local population to buy other foods should be expected to a certain degree and should not be discouraged; refugees typically set up marketplaces in camps. Bartering and trading generally improves dietary diversity and quality and provides income to buy essential non-food items such as clothes or soap. Trading foods does not mean that beneficiaries do not need all the rations. More expensive foods that give higher returns are more likely to be traded while cheaper foods are more likely to be consumed by beneficiaries.

The basic **food basket/general food ration** includes the following:

- A culturally acceptable staple food such as maize, wheat, rice, millet, sorghum or oats

- A pulse or legume, which is a source of complementary protein such as lentils, beans, peas or peanuts (groundnuts);
- Red palm oil (a natural rich source of vitamin A), vitamin A fortified vegetable oil such as groundnut, Soya, sunflower, rapeseed oil;
- A fortified blended food and the main one distributed by the World Food Programme is Corn-Soy Blend;
- Iodised salt.

Sugar and locally available meat or fish can also be part of the food basket.

Where possible, the food basket should also include locally available and culturally acceptable foods such as fruits, vegetables, condiments/spices, tea and coffee in order to add nutrients, taste and variety to basic foods, to increase the palatability, familiarity and acceptability of prepared foods and for the preparation of cultural/traditional foods and dishes. Populations generally will not consume a monotonous diet of three commodities (e.g., wheat, beans and oil) for months at a time (see Table 9-9 below).

Dried Skim Milk (DSM) should not be part of the food basket and should not be distributed to the population because of the high risk of contamination when prepared with unclean water or under unsanitary conditions because of the danger DSM poses for young children in particular. The only safe use of DSM is for therapeutic feeding under strict supervision. Breast milk substitutes should be used only in very exceptional circumstances and when provided as generic, non-brand formula. The **International Code of Marketing of Breast-milk Substitutes states:**

- No donations of breast-milk substitutes, bottles or teats should be given to any part of the health care system and donations made to institutions outside the health care system to infants who have to be fed on breast-milk substitutes should be continued as long as the infants concerned need them.

Table 9-9 presents five examples of General Food Rations that meet minimum energy, protein, fat and micronutrient requirements and that provide about 2,100 kcal, which is the established international average minimum energy requirement.

Table 9-9: General food rations (grams)³²

Food item	1	2	3	4	5
Cereal	400	450	350	400	400
Pulses	60	60	100	60	50
Vitamin A fortified oil	25	25	25	30	30
Fortified blended foods	50	40	50	40	45
Iodised salt	5	5	5	5	5
Sugar	15		20		25
Fish/meat		10		30	

The rations given in Table 9-9 provide 10% to 12% of total energy from protein and approximately 17% of total energy from fat and the micronutrients listed in Table 9-10. Micronutrient deficiencies can result from an inadequate intake of these vitamins and minerals.

Table 9-10: Daily vitamin and mineral requirements for emergency food aid⁴¹

Nutrient	Requirement/person/day	Disease
Vitamin A	500 µg Retinol equivalents or 1,666 international units	Xerophthalmia
Thiamine (B1)	0.9 mg	Beriberi
Riboflavin (B2)	1.4 mg	
Niacin (B3)	12.0 mg	Pellagra
Folic acid	160 µg	
Vitamin C	28.0 mg	Scurvy[glo7]
Vitamin D	3.8 µg	
Iron	22 mg	Anaemia
Iodine	150 µg	IDD (goitre)

The Food Basket Calculator (FBC)

The International Federation (with the support of Nestlé Research Center, Lausanne, Switzerland) has developed a software that easily calculates the energy, protein, vitamin and mineral contents of food available worldwide. It is helpful during the actual emergency to ensure the distribution of rations of 2,100 kcal/day/person. FBC is useful during the more long term assistance when vitamins and micronutrients are becoming more and more important. It is adapted to operational issues often seen in the field where some basic foods are provided by the World Food Programme and other international organizations, whilst other suitable and locally available foods, fruits and vegetables can be found to create a full food and healthy food basket. Furthermore, FBC can be used to establish special diets for special vulnerable groups and supplementary feeding.

Prevention of micronutrient deficiencies

Micronutrient deficiencies often coexist with acute malnutrition and lead to severe disorders and death. Epidemics of pellagra and beriberi as well as scurvy have occurred in situations in which food aid beneficiaries were totally dependent on food aid. These three deficiency diseases, pellagra, beriberi and scurvy have occasionally re-emerged in emergencies in the past two decades. Vitamin A and iron deficiencies are widely endemic public health nutrition problems that can also be exacerbated by food emergencies. Displaced and camp populations where the only source of food for long periods is food aid (e.g. one type of staple, beans and vegetable oil) are at especially high risk of developing micronutrient deficiencies. If clinical cases are reported, there are generally many more sub-clinical cases.

Because of the risk of these specific micronutrient deficiencies, the minimum daily requirements of essential vitamins and minerals must be ensured in the diet of populations who are fully dependent on food aid. This action prevents clinical micronutrient deficiencies and correct sub-clinical micronutrient deficiencies as follows:

- Oil should always be fortified with vitamin A;
- Iodised salt should always be distributed;
- Fortified blended foods or fresh foods rich in micronutrients must be included in food baskets of grain and oil to provide adequate vitamins and minerals in the diet; examples of blended foods are Corn Soy Blend, Unimix and Famix;
- If feasible, the target population should produce vegetables and fruits;

- If feasible, the target population should trade in food including food aid, none of which should be discouraged, Such trade increases dietary diversity and the overall adequacy of the diet;
- Vitamin A supplementation of preschoolers and postpartum women in vitamin A endemic populations is recommended;
- If dried skim milk is provided for wet feedings etc., it has to be fortified with Vitamin A.

Iron deficiency anaemia is the most widespread nutritional problem in the world. Iron deficiency is the main cause of anaemia; malaria, hookworm, schistosomiasis, other vitamin deficiencies such as vitamin B12, folic acid and vitamin A and medical conditions such as thalassaemia and sickle cell anaemia which might also contribute to anaemia in a population. **Anaemia** is diagnosed by low haemoglobin concentration levels or pallor of the skin and inner eyelids. Iron deficiency increases maternal and infant mortality, impairs cognitive development and learning and decreases physical work capacity. Young children and women of reproductive age are especially vulnerable. Diets that are high in grains and low in meat are generally low in iron because the bio-availability of iron in grains and plant foods as well as eggs and dairy products (**nonhaeme iron**) is much lower than the bio-availability in meat (**haeme iron**). The bio-availability of nonhaeme iron is increased by consuming foods containing haeme iron as well as fruits and vegetables rich in vitamin C and beer especially because it is fermented. Other foods that decrease the bio-availability of nonhaeme iron include tea, coffee, nuts, beans and maize. See section on Treatment of Severe Anaemia.

Vitamin A deficiency is a major public health problem in developing countries and a major contributing factor to the mortality of young children in emergencies. Clinical signs are night blindness, corneal lesions, nutritional blindness (xerophthalmia), increased childhood morbidity and mortality, particularly from measles and diarrhoea. Young children and pregnant women are especially vulnerable. Supplementation to prevent deficiency is recommended when deficiency is widespread. Fortified oil, blended foods, orange fruits and vegetables (mango, papaya, carrot, squash and sweet potato), eggs, dried fish and dark green leafy vegetables are rich food sources of vitamin A. See section on vitamin a supplementation.

Pellagra is caused by niacin (vitamin B3) deficiency and occurs among populations that consume maize (corn) as the staple cereal. Clinical signs are dementia, diarrhoea and dermatosis of exposed skin. Blended foods, peanuts (groundnuts), pulses, offal and dried fish are rich food sources of niacin.

Beriberi is caused by thiamine (vitamin B1) deficiency and has been observed in refugee populations consuming polished white rice as the staple cereal. Clinical signs of 'dry' beriberi are neuritis and limb paralysis; the sign of 'wet' beriberi is oedema, which can lead to cardiac failure. Thiamine deficiency has most often been observed in emergencies in southeast Asia. Parboiled rice, pulses, nuts, vegetables, eggs and brewers yeast (from beer made with fermented cereals) are rich food sources of thiamine.

Scurvy is caused by vitamin C deficiency. Outbreaks of scurvy tend to be more localised than epidemics of pellagra and beriberi. Clinical signs are poor wound healing, bleeding gums, fatigue, leg pain and a rash on the legs. Scurvy is not life-threatening. Blended foods and fresh fruits (guava, papaya, citrus and mango) and vegetables (peppers, tomatoes, cabbage, potatoes and green leafy vegetables) are rich food sources for vitamin C.

Iodine deficiency disorders do not occur as a result of emergencies, but might be endemic in the population, especially where there is no iodised salt or salt that can be inadequately iodised. Clinical signs are goitre (an enlarged thyroid gland) and impaired cognitive development that especially affects the foetus. Females suffer from goitre more frequently than males. Iodised salt is the best food source of iodine.

Food pipeline, logistics and distribution

One of the first priorities in a food emergency is to get the food pipeline up and running as quickly as possible. Government and/or relief agencies should always organise buffer stock and **preposition** some emergency food in-country so that food aid can be rapidly distributed if there is a food emergency and counteract any breakdown of the food pipeline during the operations. Food commodities are imported only when there is an in-country deficit or no practical possibility of moving available surpluses in the disaster-affected area. The estimated **average energy requirement** of 2,100 kcal per person per day is used to estimate the amount of food needed for the general food ration.

Most food aid, including supplementary food, is provided by a few bilateral donors who procure food from their domestic markets and who then give it to the World Food Programme (WFP) in response to country emergency appeals, the International Federation or NGOs to distribute. Supplementary food is sometimes procured by UNICEF. World Food Programme (WFP), UNHCR, WHO, UNICEF and the Office for the Coordination of Humanitarian Affairs are the main UN agencies involved in humanitarian assistance operations. The International Federation, NGOs, local government officials and populations are responsible for implementing food distribution and emergency nutrition interventions.

The main costs of food aid programmes are the purchase of food and its transportation. Food should be procured locally as much as possible because of the transportation and storage costs of imported food. Transportation depends on the urgency of delivering food aid. Air freight is the most expensive option, followed by truck and rail. Procurement and transport of imported food takes at least several weeks.

The largest amounts of procured food are **cereal grains**. To estimate food requirements, daily rations per person of cereal, pulses, corn-soy blend, oil and salt are multiplied by population size and the planning period, e.g. ninety days. Current food stocks are subtracted by the totals to give the surplus or shortfall in Metric Tons (MT). A general rule of thumb for estimating the amount of storage space for cereal grains is 2m³ per MT. Calculate a minimum of 10% losses during transport, storage and distribution.

Blended foods cost several times more than cereal grains per MT. Because two or three times more emergency victims can be fed using bulk grains than blended foods, relief agencies sometimes reserve blended foods primarily for supplementary feeding programmes. Blended foods can spoil faster than whole grains.

Problems with the food pipeline are not uncommon and include:

- Inadequate food pipeline at the outset of the food emergency-Nutrition surveys should be conducted where appropriate and used to advocate for emergency food and support. Reliable estimates of the target population and number of malnourished individuals are needed;
- Excessive food losses-Up to 10% of food losses are acceptable, but greater losses can occur during packing, transportation and storage. Blended foods spoil more quickly than cereal grains. Food losses can also occur because food is diverted or because of over scooping at distribution sites. Inventory and monitoring systems to manage, track and account for the movement of food commodities help prevent excessive food losses.
- Decreased food pipeline over time-The most food-insecure geographic areas must be targeted first. Targeting of food-insecure households and vulnerable groups in the population such as households with children under five or pregnant and lactating women, however, might be impractical when the food emergency is widespread. Food aid distribution should be reduced or stopped after a harvest.
- Competition between agencies-All organisations should provide similar general food rations to different communities in generally similar conditions;
- The need for provisions for refugees and displaced persons beyond the local population-Provisions should be made for the surrounding population as needed;

- Low or poor coverage of the target population-In a large emergency, especially when the population is scattered over a large geographical area, some subpopulations or pockets might be overlooked. Identifying and reaching all vulnerable households and communities can be difficult when the population is large or dispersed. Increasing the number of distribution points for food aid can also help. Nutrition surveys of neglected areas should be conducted;
- Beneficiary dependency on food aid-Displaced populations can become fully dependent on food aid. Food aid should be provided in a decentralised manner to discourage population displacement or concentration;
- Failure in the pipeline or interruption in one or more commodities in the food pipeline-Missing food commodities need to be temporarily replaced with other food items using the substitution ratios in Table 9-11.

Table 9-11: Substitution ratios for common food items³²

Blended food for beans	1:1
Sugar for oil	2:1
Cereal for beans	2:1
Cereal for oil	3:1

An adequate food pipeline does not guarantee that food will be equitably distributed to all needy households. The food aid distribution system must be:

- **Transparent** - The target population should have information about the rations, the timing and distribution of which should take place in a public place;
- **Fair** - Rations are based on need and household size;
- **Accountable to beneficiaries** - Distribution should take into account the social, ethnic and political divisions within the target population;
- **Accountable to donors** - Reports of food distributed and numbers of beneficiaries must be provided on a regular basis and external monitors present during distribution;
- **Gender-sensitive** - Women must be allowed to collect food, be represented on food committees and never placed at risk.

In stable situations, existing government structures are the first choice for the distribution of food aid because information, administration and transport networks are already in place. In emergencies associated with conflict, it might not be appropriate for government structures or local/traditional leaders to distribute food aid. In conflict situations, NGOs distributing food aid should:

- Have food distribution experience;
- Work in the geographic area of operation;
- Be able to mobilise staff quickly;
- Maintain neutrality.

Registration of the target population should be completed as soon as possible and kept up-to-date. In the first stages of an emergency especially if there is population displacement, the number of beneficiaries can change quickly. Registration of vulnerable households such as households affected by HIV/AIDS and female-headed households or politically marginal groups should be given special attention. Food aid can be distributed directly to households, ration cards with family size and address issued. Alternatively, food aid can be distributed in bulk to groups in which households are informed of their entitlements and in which distribution is done by the group within the group.

Rations can be distributed weekly, biweekly or monthly depending on security and the target population's dispersion. Rations must not be too heavy to carry over long distances. UNHCR recommends one distribution site for 20,000 persons and a maximum travel distance of five to ten kilometres.

Supplementary feeding

Supplementary feeding is not a substitute for inadequate general rations and should always be considered in the context of the general food ration. Supplementary feeding programmes include the following:

- **Blanket supplementary feeding** is a stopgap measure to prevent the deterioration of high-risk groups' nutritional status such as children under five, pregnant women, lactating women, HIV/AIDS affected families and the elderly. In emergency situations, the World Food Programme, UNHCR and implementing agencies work to ensure the timely provision of an adequate general food ration. Nevertheless, supplementary food might be needed for a certain period for subpopulations who are either already malnourished or at high risk of becoming malnourished. Blanket supplementary feeding is to be considered for instance at the beginning of a food emergency when the food pipeline for the general food ration is still inadequate;
- **Targeted supplementary feeding** is for acutely malnourished children from six months to five years according to set cut-off criteria (Mid-Upper-Arm Circumference < 12.5 cm or weight of 70% to 79% weight-for-height); for pregnant women in the second or third trimester of pregnancy; lactating women up to six months postpartum; adults who are severely malnourished based on Body Mass Index (BMI <16); and the **elderly**. A specific group giving major concern is families affected by HIV/AIDS. The purpose of targeted supplementary feeding is to prevent severe acute malnutrition among the moderately malnourished and to limit the need for widespread therapeutic feeding among children in particular. Targeted supplementary feeding is often implemented on a limited scale;
- **Supplementary feeding linked to therapeutic feeding** is for children discharged from therapeutic feeding but are still moderately malnourished. Children are generally discharged from these supplementary feeding programmes when they reach 85% of median weight-for-height and maintain this weight for two successive weighing.

When information about the prevalence of acute malnutrition is lacking in a nutrition emergency, planning figures of 15% acute malnutrition among children under five can be used to estimate supplementary food requirements for these children.

For example:

For an emergency affected population of 30,000

Estimated number of children aged less than five years (15% to 20%)	4,500 to 6,000
Estimated number of moderately malnourished children (15%)	675 to 900

For supplementary food interventions targeting pregnant or breastfeeding women, the percentage 2.5% can be used to estimate the percentage of pregnant women among the total population; 2.5% can also be used to estimate the percentage of breastfeeding mothers among the total population.

Table 9-12 presents examples of rations for supplementary feeding.

Table 9-12: Supplementary feeding rations (g) (10-15% of kcal from protein and 30% of kcal from fat)⁴¹

Food commodity	Take-home daily dry ration		On-site daily wet ration	
	1	2	3	4
Blended fortified food	200	250	75-100	-
Cereal				125
Pulse				30
Oil, fortified with vitamin A	20	25	15-30	20
Sugar	15	20	10-20	
Salt, iodised				5

Dry rations for home preparation should be provided whenever possible. **Wet rations** (cooked food) should be limited to situations following a major disaster when people do not have the means to cook for themselves or when the distribution of dry rations could put them in danger for instance while walking home. Take-home supplementary food dry rations provide 1,000 to 1,250 kcal/person/day while on-site feeding or wet rations provide 500 kcal/person/day.

The preparation of supplementary food must be culturally appropriate to be palatable and include locally available foods. The World Food Programme has collected recipes from around the world using fortified blended food to prepare staple foods such as pancakes,^K thick porridge^L, thin porridge^M, and unleavened bread^N.

High-energy biscuits (called BP5 and BP100) are sometimes used for supplementary feeding when fortified blended food or cereal/pulse blends are not available. The biscuits should be dissolved in water if used for feeding young children. High-energy biscuits are inappropriate for children recovering from severe malnutrition and should not be used in therapeutic feeding. High-energy biscuits can, however, supplement the diets and energy intakes of pregnant women in their second trimester to reduce the incidence of low birth weight.

Table 9-13 summarises the criteria for starting and closing supplementary feeding programmes.

Table 9-13: Criteria for opening and closing emergency supplementary feeding³¹

	When to open	When to close
Blanket supplementary feeding	At onset of an emergency, before the food pipeline and general food ration are improved and sustained. Outbreak of scurvy, beriberi or pellagra in the target population.	When the food pipeline and general food ration distribution are adequate. When there are no cases of scurvy, beriberi or pellagra in the target population.

^K Enjira (Ethiopia), kamja jijim and koguma jijim (Korea), kiseru (Sudan), laho (Somalia), uttapam (India).

^L Banku (Ghana), madida (Sudan), nsima (Malawi), ubhugali (Burundi), ugali (Tanzania).

^M Bouillie (Senegal), bubur (Indonesia), shooro (Somalia/Ethiopia).

^N Drabeel, karapeech or youkeh (Middle East/North Africa), roti or chapati (Afghanistan, Bangladesh, India, Nepal, Pakistan, Yemen). . . .

Targeted supplementary feeding	To prevent deterioration in the nutritional status of vulnerable groups in the population (children under five, pregnant women, lactating women, families affected by HIV/AIDS, the elderly) and when there is a need for large-scale therapeutic feeding.	When the prevalence of global acute malnutrition is stable or declining.
Supplementary feeding linked to therapeutic feeding	When there are too many severely malnourished individuals to be treated adequately in existing health care facilities.	When the number of severely malnourished cases decreases to a number that can be adequately treated in clinics or hospitals.

Infant and young child feeding in emergencies

Beyond the provision of foods, programme strategies to reduce malnutrition and mortality and to improve child growth through the promotion of appropriate infant and young child feeding practices are often overlooked. Infant and young child feeding practices include breastfeeding, complementary feeding, psychosocial care and nutritional care of sick and malnourished children, personal hygiene and food safety both in the home and at therapeutic and supplementary feeding sites. Infant and young child feeding practices can be improved through education, counselling and the active involvement of caregivers in child feeding.

In food emergencies, **breastfeeding** can be life-saving. Outbreaks of diseases such as diarrhoeal diseases and malaria with conditions of poor sanitation and inadequate access to water make breastfeeding the safest and only practical choice for feeding infants and young children. Health care workers from cultures where breastfeeding is not the norm and who lack basic breastfeeding information and management skills need to be trained. Key breastfeeding information and messages are given in Table 9-13. Recommendations to promote and support breastfeeding in emergencies are summarised in Table 9-14.

Complementary foods are non-breast-milk foods. Appropriate complementary feeding is:

Timely - Complementary foods are introduced at about six months of age.

- Adequate - Complementary foods provide adequate energy, protein and micronutrients to meet the growing child's needs.

Nutritional care of sick and malnourished children includes the use of Integrated Management of Child Illness protocols for assessment and treatment, continued feeding during illness and increased variety, frequency and amounts of food during convalescence.

Psychosocial care giving means that the caregiver actively helps her child to eat while remaining sensitive to the demands of the child; she is patient and allows the child to eat at its own pace, verbally encourages the child to eat without force feeding and allows it to try different foods if it refuses to eat.

Personal hygiene and food safety mean that foods are stored, prepared and fed with clean hands; utensils and baby bottles are not used.

Caregivers should receive sound information and counselling at health, therapeutic and supplementary feeding centres about breastfeeding and appropriate complementary foods including fortified foods^o. Mother-to-mother support groups and peer counselling should be promoted for community outreach.

^o **Counselling** is the process of providing guidance to assist an individual in adjusting food consumption to meet needs. . . . Counselling skills include listening, empathy, providing sound

For mothers who test negative or do not know their **HIV status**, antiretrovirals and exclusive breastfeeding for the first six months of life can prevent mother-to-child transmission of HIV. Providing antiretroviral prophylaxis (e.g. Niverapin) to HIV-positive pregnant women and to babies at birth can cut the risk of transmission by half. The risk of HIV transmission for more than one year is between 10% to 20%. This needs to be balanced against the risk of increased morbidity and mortality due to diarrhoeal and other diseases when infants are not breastfed. The risk of HIV transmission by exclusive breastfeeding for six months (with no water, infusions or non-breast milk foods) is nearly zero.

For women to make appropriately informed choices about infant feeding, the availability of counselling and testing is crucial. For infants born to known HIV-positive mothers, adequate replacement feeding is recommended. Replacement feeding however, which includes infant formula for young infants, must be acceptable, feasible, affordable, sustainable and safe.

In many emergencies, the majority of women do not know their HIV status. WHO policy on breastfeeding and infant feeding are:⁵¹

- Exclusive breastfeeding should be protected, promoted and supported for six months. This applies to women who are known not to be infected with HIV and for women whose infection status is not known;
- When replacement feeding is acceptable, feasible, affordable, sustainable and safe, the avoidance of breastfeeding by HIV-infected mothers is recommended otherwise, exclusive breastfeeding is recommended during the first months of life;
- To minimise HIV transmission risk, breastfeeding should be discontinued as soon as feasible, taking into account the individual mother's situation and the risks of replacement feeding, including malnutrition and other infections.

It is important that replacement feeding, advised as one option for feeding infants of HIV-infected mothers, does not 'spill over' to the general population as an option for all infants.³²

Table 9-14: Breastfeeding messages during emergencies¹²

1. Nearly every woman can breastfeed her baby;
2. Breast milk has everything the baby needs for the first six months of life;
3. Breastfeeding protects against infections, especially diarrhoea and acute respiratory infections;
4. Breastfeeding is cost-effective;
5. Malnourished and traumatised mothers can produce adequate quantities of breast milk;
6. Hormones released during breastfeeding help to relax the mother and counteract stress.

Table 9-15: Recommendations to promote and support breastfeeding in emergencies¹²

1. All breastfed infants in emergencies should continue to be breastfed;
2. Infants should be exclusively breastfed until six months of age and beyond if safe (uncontaminated) complementary foods are not available;
3. Infants should continue breastfeeding alongside complementary feeding into the second year of life;
4. At least one member of each humanitarian field team should have breastfeeding

information, support and helping the individual decide what to do.

management skills to help mothers breastfeed, including:

- Positioning and attachment of the baby to the breast;
 - Keeping mothers and babies together and letting them sleep together;
 - Frequent nursing (eight to twelve times in twenty-four hours);
 - Exclusive breastfeeding for the first six months of life;
 - Avoidance of bottles and pacifiers;
 - Expression of milk and feeding by cup for babies unable to suckle;
5. Access to lactation expertise for training and non-routine breastfeeding situations;
 6. Restriction of donations of breast milk substitutes and supplies for bottle-feeding. Donations must adhere to the terms of the International Code of Marketing of Breast-milk Substitutes;
 7. Relactation when breastfeeding has not started or has stopped prematurely. There must be an exceptional availability of breast milk substitutes for babies during the transition;
 8. Public relations with the media and quick response when the media report that emergencies compromise a mother's ability to breastfeed her baby.

Emergency nutrition intervention response

The need to set up therapeutic feeding programmes after the initial stage of an emergency signals that the emergency food response has been insufficient and/or that the nutritional status of the target population before the emergency was poor. It also signals that aggravating factors such as HIV/AIDS are present or that an infectious disease epidemic is occurring. Populations in a nutrition emergency require life-saving measures that address the immediate and underlying causes of malnutrition. More effort should be directed toward preventing the suffering of young children who deteriorate to such an extent that they need therapeutic feeding and urgent medical care.

The main emergency nutrition interventions are therapeutic feeding and vitamin A supplementation. Untreated, the risk of death is high in cases of marasmus, kwashiorkor and severe vitamin A deficiency (xerophthalmia). The cardiovascular system, the liver, the genitourinary, gastrointestinal and immune systems, the regulation of glucose metabolism, basal metabolism and temperature regulation and the regulation of cellular electrolytes and glands of the severely malnourished patients are critical. While severe malnutrition is reversible and **case fatality** rates can be low (under 10%), if medical staff are well-trained, some children in therapeutic feeding centres have underlying infectious diseases such as measles, TB and HIV/AIDS (up to 15% to 20% of cases in therapeutic feeding centres). They do not survive.

Severe malnutrition is expensive in terms of supplies and human resources. The staff of a therapeutic feeding centre could include one programme coordinator, one medical doctor or medical care nurse, two nurses or assistants for phase one of treatment, two nurses or assistants for phase two, one feeding assistant for every ten inpatients, two cooks (day and night), community outreach workers, one storekeeper, cleaners and two guards (day and night). Training or retraining medical staff in therapeutic feeding is generally needed because staff that worked in earlier emergencies and institutional memory can be lost. Wherever possible, programmes should build on and strengthen existing capacity of national health facilities and hospitals to treat severe malnutrition.

Therapeutic feeding centres should be located as close as possible to the communities they serve in order to discourage displacement. The proximity also reduces the transit time for family members bringing malnourished children for feeding and allows caregivers to be educated and at the same time to participate in the care of their child and

help decrease the default rate. There can be time conflicts for mothers wishing to comply with therapeutic as well as supplementary feeding programmes including time lost for domestic work and the care and protection of other children and the household.

Treatment of **complicated cases of severe malnutrition** consists of two phases and a transition phase between phases one and two. It takes place in Therapeutic Feeding Centres (see Therapeutic Feeding Protocol). Community-Based Therapeutic Care is the outpatient management of uncomplicated cases of severe malnutrition such as children with no sign of infection, who still have good appetites, no oedema and do not require a nasogastric feeding tube. See community therapeutic care.

A national training programme in therapeutic feeding was undertaken in Ethiopia in 2002 to 2003 to build national and NGO capacity to provide high-quality therapeutic feeding.

Therapeutic feeding protocol

The therapeutic feeding protocol is for complicated cases and children six months of age and older^P.

Admission-Percentage of the reference standard is used for assessing individual children for admission and discharge from therapeutic and supplementary feeding^Q. Less than 70% of median weight-for-height international reference standards are the criterion used for admission to therapeutic feeding. Ideally, a child accompanied by a caregiver is admitted to a therapeutic feeding centre upon referral from a health centre where children are screened for severe malnutrition, including kwashiorkor.

Phase 1: The aim of phase 1 is to treat major medical problems and initiate re-feeding. Proper medical treatment and therapeutic feeding is crucial during phase 1 to prevent death. Shock, septic shock and heart failure, conditions that require a physician's care, can occur. Misdiagnosis and treatment of dehydration is a common cause of death in cases of severe malnutrition. In severe malnutrition, renal dysfunction makes Standard Rehydration Solutions dangerous because of the risk of sodium overload and heart failure.

Step 1. Initiation of re-feeding.

- Eight feeds of F75 (therapeutic milk providing 75 kcal/100 ml) and care twenty-four hours per day. Breastfed children should be breastfed before they are fed F75^R;
- The total amount of F75 to feed is 100 kcal/kg of body weight/day (Table 9-16); No adjustment is made for cases of kwashiorkor;
- Nasogastric tubes should be used for anorexic children (children who do not have an appetite) who do not feed sufficiently by mouth (less than 75 kcal/kg/day); Nasogastric tubes should be inserted by trained medical staff;
- If no F75 is available, F100 diluted in 2.7 litres of water instead of 2 litres, which is the normal dilution, can be used.

^P Exclusive breastfeeding should be reestablished for infants less than 6 months of age using supplemental suckling and dilute F100 (1 package in 2.7 litres of water) as follows. Dilute F100 is put in a cup and the end of a nasogastric tube is put in the cup and the tip of the tube is put on the breast near the nipple. . . . When the baby suckles, she sucks the therapeutic milk. . . . The cup should be placed below the level of the breast so the milk does not flow too fast.

^Q Percent of reference % WFH = $\frac{\text{weight}}{\text{median reference weight-for-height}} \times 100$

^R F75 and F100 are therapeutic milks that can be procured through UNICEF. . . . One packet of F75 or of F100 is dissolved in 2 litres of water.

Table 9-16: Amounts of F75 to feed during phase 1 of therapeutic feeding³⁰

Body weight (kg)	8 Feeds per 24 hr (ml per feed)	Body weight (kg)	8 Feeds per 24 hr (ml per feed)
3.0 -3.4	60	8.0 -8.9	140
3.5 -3.9	65	9.0 -9.9	155
4.0 -4.4	70	10 -10.9	170
4.5 -4.9	80	11.0 -11.9	190
5.0 -5.4	90	12.0 -12.9	205
5.5 -5.9	100	13.0 -13.9	230
6.0 -6.9	110	14.0 -14.9	250
7.0 -7.9	125		

Step 2. Administration of routine medicines to all children.

- Treatment of vitamin A deficiency if in a vitamin A-deficient area (Table 9-21);
- Treatment of malaria if in an endemic area-Treatment according to national protocol. All children should sleep under mosquito nets in malaria endemic areas;
- Antibiotics-The first line of treatment is amoxicillin (Table 9-17);
- Folate-5 mg on the first day;
- Oral iron supplements to treat severe anaemia should not be given in phase 1.

Table 9-17: Antibiotic treatment of severely malnourished children³⁰

Weight (kg)	Amoxicillin dosage per day (mg)
2-6	62.5 * 3
6 -10	125 * 3
10 -30	250 * 3
>30	500 * 3

Step 3. Systematic recording of a child's signs, symptoms and weight:

- Weight is measured daily and plotted on a growth chart;
- Oedema is assessed daily;
- Body temperature is measured twice a day;
- Stool, vomiting, dehydration, cough and respiration are noted daily;
- Refusal to feed and use of nasogastric tube is noted daily.

Step 4. Treatment of hypoglycaemia

- The main signs of hypoglycaemia in the severely malnourished are low body temperature, lethargy, limpness and loss of consciousness;
- Patients who are conscious should be given F75 or 50 ml of 10% sugar water by mouth at least every three hours;
- Patients who are losing consciousness should be given 50 ml of 10% sugar water by nasogastric tube immediately. When consciousness is regained, they should be fed F75.

Step 5. Diagnosis and treatment of hypothermia

- Hypothermia is diagnosed when rectal temperature is $<35.5^{\circ}\text{C}$ or the underarm temperature is $<35^{\circ}\text{C}$;
- Children should not be bathed when admitted;
- Children should wear a hat and be placed on the caregiver's bare chest and covered with clothes and blankets. Warm tea should be given to the caregiver;
- Children should sleep with their caregivers and not on the floor. Windows and doors should be closed at night.

Step 6. Diagnosis and treatment of dehydration

- Classic signs of dehydration should not be used because they mimic signs of marasmus (skinfolts, sunken eyes and dry mouth). Diagnosis of dehydration is, therefore, based on a definitive history of recent diarrhoea that was watery and frequent as well as on a recent change in the child's appearance according to the caregiver. Signs of severe dehydration (shock) are a weak or absent pulse, cool or cold extremities and loss of consciousness;
- **Resomal** is a solution that contains less sodium and more potassium than standard Standard Rehydration Solutions. It is formulated for the rehydration of dehydrated and severely malnourished individuals. Between 50ml and 100ml of Resomal per kg of body weight over twelve hours is usually enough to restore normal hydration, starting with 5 ml/kg every thirty minutes. Rehydration should be gauged by measuring the child's weight at intervals with the target weight gain being 5% of body weight. Care should be taken not to over hydrate the child. Clinical improvement should be noted after two hours. If it does not occur, the diagnosis of dehydration was wrong;
- Breastfeed and begin to give F75 as soon as possible;
- Children who have kwashiorkor are generally over hydrated and should not be treated for dehydration unless there is a definitive history of watery diarrhoea;
- Children with diarrhoea should be fed while being rehydrated. Even if diarrhoea is profuse, some nutrients are absorbed and feeding helps the child to recover.

Transition phase: The criteria to move from phase 1 to the transition phase are the return of appetite and the loss of oedema in cases of kwashiorkor.

- No child should be fed by nasogastric tube;
- Kwashiorkor cases should lose all their oedema before being moved from transition phase to phase 2;
- The only change in treatment is to give F100 instead of F75. The number of feeds, timing and amounts remain the same as in phase 1;
- F100 should never be given at the same time as Resomal. Rapid weight gain (>10 g/kg/day) is a sign of over hydration. If this occurs, the child should be returned to phase 1 and F75 for a few more days;
- Patients should remain in transition for about two days.

Phase 2: The aim of phase 2 is to allow the child to eat to appetite and regain weight rapidly.

- Breastfed children should receive breast milk before F100;
- Day care only;
- Six feeds should be given per day;
- The total amount of F100 to feed is 150-220 kcal/kg of body weight/day;
- Children should be encouraged to eat but not force-fed;
- Iron supplementation, de-worming medicine and measles vaccination should be given;
- Porridge can be fed after F100. Feeding porridge may slow recovery.

Table 9-18: Amounts of F100 to feed during phase 2 of therapeutic feeding³⁰

Body weight (kg)	6 Feeds per 24 hr (ml per feed)	Body weight (kg)	6 Feeds per 24 hr (ml per feed)
3.0-3.4	110	8.0-8.9	270
3.5 -3.9	120	9.0 -9.9	300
4.0 -4.0	150	10 -11.9	350
5.0 -5.9	180	12.0 -14.9	450
6.0 -6.9	210	15.0 -19.9	550
7.0 -7.9	240		

Discharge: At least 80% of median weight-for-height international reference standards and no oedema are the criteria used for discharge from therapeutic feeding and admission to supplementary feeding where available. Discharge should be at 85 % weight-for-height if there is no supplementary feeding programme.

Community therapeutic care

Community therapeutic care is appropriate for uncomplicated cases of severe malnutrition (children who have good appetites and have no oedema, do not require a nasogastric tube for feeding) on an outpatient basis. It costs less than the care at a therapeutic feeding centre and results in similar mortality and recovery rates. The great advantage of community therapeutic care is that it reaches many more children than therapeutic feeding centres, but there must always be a referral centre for complicated cases.

Community therapeutic care programmes use a ready-to-use therapeutic food, Plumpy Nut, which is made from vegetable fat, peanut butter, dried skim milk, sugar and fortified with vitamins and minerals. Plumpy Nut can be obtained through UNICEF. Two to three packets of Plumpy Nut per day per child are provided in a day care centre under supervision or to take home. In day care programmes, routine medicines are administered and children are weighed each day. Take-home programmes provide routine medicines and Plumpy Nut (fourteen packets) and a blended supplementary food (3kg to 4kg) per week as a take-home ration, with home visits once or twice a week by outreach workers.



Community therapeutic feeding programme: supervision of children eating Plumpy Nut
(Photo: J Pierre-Louis, UNHCR, 2004)

Routine medicines are similar to those used in therapeutic feeding centres and include the following:

- Resomal for cases of dehydration^S;
- Albendazole or mebendazole;
- Vitamin A supplementation;
- Folic acid;
- Co-trimoxazole (five-day course).

Mosquito nets as needed are distributed for use at home.

Caregivers should be guided on the appropriate use of Plumpy Nut and preparation of porridge using blended supplementary food as follows.

- Plumpy Nut is a special food like medicine and is not to be shared with siblings;
- Children should be fed as much Plumpy Nut and porridge as they can eat every three hours.

Parents should be instructed as follows:

- Children should be kept warm;
- Encourage but do not force feed children;
- Wash hands and cover food and water;
- Rapidly refer children who become ill to the health centre.

Therapeutic feeding supplies

Where information about the prevalence of acute malnutrition is lacking in a nutrition emergency, planning figures of 2% severe malnutrition among children under five may be used to estimate therapeutic food requirements.

For example:

Estimated size of the emergency affected population	30,000
Estimated number of children aged less than five years (15-20%)	4,500-6,000
Estimated number of severely malnourished children (2%)	90-120

F75, F100, Resomal and Plumpy Nut can be procured through UNICEF.

- F75. Twenty sachets of 410 g cover the requirements of twelve children in phase 1 (three days);
- F100. Twenty sachets of 456 g cover the requirements for one child in phase 2 (thirty days);
- Resomal. Two sachets of 8.4 g cover the requirements for one child;
- Plumpy Nut. Ninety sachets (two to three sachets of 92 g per child per day) cover the requirements for one child (forty-five days).

If F100 is unavailable, high-energy milk may be prepared from Vitamin A fortified Dried Skim Milk (DSM), sugar and oil as follows:

- DSM 220g;
- Sugar 120g;
- Oil 60g;
- Water 1.7 litres.

^S This is different from the classical therapeutic feeding protocol wherein children who have good appetites do not receive Resomal. . . . Resomal is given as a precaution against sodium overload. . . .

One scoop (6.35 g) of **therapeutic vitamins and minerals** (ThCMV) should be added to the above.

Other supplies needed for therapeutic and supplementary feeding are listed in Table 9-19. Kits with non-food and nonmedical items needed for a feeding programme are available through UNICEF, Médecins sans Frontières and Oxfam. Some materials can be purchased locally. All health facilities including therapeutic feeding centres need water, latrines or toilets, beds or mats, cooking fuel and food for caregivers. A therapeutic feeding centre should be clean, be enclosed to protect children against the cold and have adequate space. Beds are not necessary when children and mothers are accustomed to sleeping on mats.

Table 9-19: Supplies for emergency nutrition interventions³⁰

Screening for acute malnutrition	<ul style="list-style-type: none"> ▪ Salter scales, weighing pants, Mid-Upper-Arm Circumference measuring tapes, height boards, weight-for-height reference tables, registration books, health cards ▪ Stationery: clipboards, notebooks, pens, pencils, erasers, pencil sharpeners, rulers, calculators, scissors ▪ * Instructions and guidelines
Therapeutic and supplementary feeding centres	<ul style="list-style-type: none"> ▪ Cooking pots, large spoons, cups, bowls, teaspoons, measuring jugs, measuring spoons/scoops, ladles, can openers ▪ Salter scales, weighing pants, clocks ▪ Large bowls, plastic water containers, plastic buckets, flashlights and batteries, plastic potties ▪ Blankets, lamps, flashlights ▪ Nasogastric tubes (CH#8, 10), syringes (60 ml, 200 ml) ▪ Water filter, water-purifying tablets ▪ Cleaning materials, soap ▪ * Patient charts, registration book, markers
Therapeutic feeding centre essential medical supplies (partial list)	<ul style="list-style-type: none"> ▪ Routine medicines (phases 1 and 2) ▪ Fever reducer ▪ Topical ointments: zinc oxide, tetracycline eye ointment ▪ First aid: bandages, soap, scissors, iodine ▪ Nasogastric tubes ▪ * Thermometers

Vitamin A supplementation

Vitamin A deficiency is a major contributing factor to mortality in emergencies. High-dose vitamin A supplementation can reduce the duration of the disease, its severity, complications and prevent nutritional blindness or xerophthalmia (Table 9-20). Vitamin A supplementation can be provided with immunisations as appropriate e.g. measles in the affected population. Vitamin A supplementation coverage of the population should be at least 70%.

Table 9-20: Supplementation protocol to reduce and prevent vitamin A deficiency⁴⁴

Age group	Every 4- 6 months
6 -11 months	100,000 international units
12-59 months	200,000 international units

High-dose vitamin A supplements should also be given to all cases of:

- Xerophthalmia and children living in the same household or community as a child who has xerophthalmia;
- Measles;
- Severe acute malnutrition, kwashiorkor and marasmus (Table 9-21).

Table 9-21: Vitamin A supplementation: xerophthalmia, measles and severe acute malnutrition⁴⁴

	Age in months	Immediately	Next day	2 weeks later
Severe malnutrition	0-5	50,000 IU	50,000 IU	
	6-11	100,000 IU	100,000 IU	
	>12	200,000 IU	200,000 IU	
Xerophthalmia	0-5	50,000 IU	50,000 IU	50,000 IU
	6-11	100,000 IU	100,000 IU	100,000 IU
	>12	200,000 IU	200,000 IU	200,000 IU
Measles	0-5	50,000 IU	50,000 IU	
	6-11	100,000 IU	100,000 IU	
	>12	200,000 IU	200,000 IU	

The signs and stages of xerophthalmia are as follows:

- Night blindness-Difficulty seeing in the dark;
- Xerosis-The white of the eye loses its shine and begins to wrinkle;
- Bitot Spots-Patches of grey bubbles on the white of the eye;
- Corneal ulceration-Damage to the cornea;
- Keratomalacia-Soft or bulging cornea.

Corneal ulceration is a medical emergency requiring immediate treatment to prevent the loss of vision in the affected eye. Keratomalacia is the last clinical stage of xerophthalmia where the eyesight in the affected eye has been lost.

Maternal night blindness due to vitamin A deficiency is common in the latter half of pregnancy in some populations. It affects an estimated 10% to 20% of pregnant women in south and southeast Asia. Symptoms of night blindness are blurred or hazy vision at dusk and a history of inability or difficulty working or engaging in activities at night. WHO recommends treating maternal night blindness with daily oral doses of 10,000 International Units (IU) of vitamin A for four to eight weeks. High doses of vitamin A such as those used to supplement preschool-aged children can cause birth defects and should not be given to women of reproductive age except postpartum within six to eight weeks of delivery (200,000 IU).

In 2004, a measles immunisation and vitamin A supplementation campaign combined with polio immunisation was undertaken by the international community and the ministry of health in Darfur, reaching more than two million children.

Treatment of severe anaemia

Iron is essential to synthesise haemoglobin, which is a protein in the blood that transports oxygen. Anaemia is defined by low haemoglobin concentration which decreases the amount of oxygen transported to the cells of the body. Severe anaemia is a haemoglobin concentration of <7 g/dl or haematocrit of <20%, leading to cardiac decomposition to the

point that the heart cannot maintain adequate blood circulation. Where laboratory tests are impractical, severe anaemia might be diagnosed by using extreme abnormal pallor of the inner eyelid, the nail beds or palms of the hands.

Any child who has kwashiorkor or marasmus should be assumed to be severely anaemic and be treated for severe anaemia in phase 2 when the child regains his appetite and is gaining weight. The protocol for treatment of severe anaemia is given in Table 9-22.

Table 9-22: Protocol for treatment of severe anaemia²⁴

Age group	Daily dose	Duration
<2 years	25 mg of iron + 100-400 ug of folate	3 months
2 -12 years	60 mg of iron + 400 ug of folate	3 months
Adolescents and adults, including pregnant women	120 mg of iron + 100-400 ug of folate	3 months

Monitoring and evaluating the adequacy of the emergency response

Monitoring involves both the relief response (the process) and the nutritional status of the target population (outcomes). Management of the food pipeline and food aid distribution, the performance of therapeutic and supplementary feeding programmes and vitamin A coverage should be monitored to determine whether these interventions are adequate. In addition, programmes should be periodically planned and reviewed using the internationally agreed Sphere Project food and nutrition standards. Using the findings to improve decision making and coordination e.g. changing strategies in response to changes in needs or the disaster context strengthens implementation and improves the adequacy of the emergency response as well as accountability.

Management of the food pipeline and distribution

The following checklist can be periodically used by managers to monitor management of the food pipeline.

Table 9-23: Checklist for monitoring the food pipeline

Activity	√	Remarks
Purchase contracts provide for delivery-linked payments, the return of damaged goods and penalties for any deviations in fulfilment of the contract.		
Transporters and handling agents assume total liability for food commodities in their care and reimburse any losses.		
Storage facilities are safe and clean and protect food commodities from damage and/or loss.		
Steps are taken at all levels to minimise commodity losses.		
All losses are identified and accounted for.		
Commodities in damaged containers are salvaged as far as possible.		
Commodities are inspected at regular intervals and any suspect commodities are tested.		

Unfit items are certified and disposed of in accordance with defined procedures and national public health regulations.		
Physical inventory counts (receipts, issues and stock balances) are undertaken periodically e.g. every fourteen days and are reconciled.		
Summary inventory including pledges and expected arrivals are compiled at regular intervals and made available to all stakeholders.		
Activity	√	Remarks
Waybills document all commodity transactions.		
Stock ledgers provide details of all receipts, issues and balances.		
Auditing is carried out at all levels of the supply chain. Accounting and reporting happens all along the supply chain from origin through delivery to distribution sites.		
Vehicles carrying food commodities must be in good running order, cargo spaces have no protruding edges that can damage packaging and are protected from bad weather (e.g. by tarpaulin).		
Vehicles that carry food commodities do not carry other commercial and/or hazardous materials.		
Vehicles should not have carried hazardous commodities in the recent past. There should also be no residues.		
Distribution and acceptability of the ration received to beneficiaries are confirmed through records and random interviews during visits to target households.		
Distribution reporting includes number of actual beneficiaries for the particular distribution period, the opening balance of food stocks, the quantity of commodities distributed, losses, damages and closing balance.		

Performance of feeding programmes

The following example shows how to calculate for a therapeutic feeding centre the default rate, death rate and recovery rate for a given time period, e.g. one month. The same rates are calculated to monitor the performance of a supplementary feeding centre.

Table 9-24: Sample supplementary feeding centre data

Caseload at beginning of period	New admissions (weight-for-height < 70%)	New admissions (bilateral oedema)	Relapsed cases	Defaulted Cases	Deaths	Recovered cases	Caseload at end of period
97	37	5	1	23	6	48	63

- Default rate = $23/(23+6+48) = 29\%$;
- Mortality rate = $6/(23+6+48) = 8\%$;
- Recovery rate = $38/(23+6+48) = 49\%$.

The recovery rate for therapeutic feeding should be greater than 75%; the death rate should be less than 10% and the default rate should be less than 15%. Default rates are influenced by accessibility (distance, security) and the quality of care provided^T. The above example is one of a therapeutic feeding centre whose performance needs strengthening. While the death rate is acceptable, the recovery rate is too low and the

^T This threshold for mortality is not adjusted for a high proportion of cases that are HIV-positive; the extent to which mortality rates are affected by HIV is unknown. . . . Mortality rates should be interpreted in light of the severity of the malnutrition being treated. . . .

default rate is too high. These statistics are analysed over time for trends e.g. for increasing caseloads, which signal the need to expand therapeutic feeding. The statistics are compiled monthly and compared to those of other therapeutic feeding centres and affected areas at regional and national levels.

Nutrition monitoring and nutrition surveillance

Once a food and/or nutrition emergency response has been triggered, nutrition surveillance is used for monitoring acute malnutrition rates over time in different areas and in different socioeconomic groups. The same benchmarks used to trigger an emergency response are eventually used to recommend the scaling down of food and nutrition emergency interventions.

Table 9-25: Nutrition surveillance benchmarks

Nutrition situation	Recommended actions
Acute malnutrition rate >15% OR 10%-14% with aggravating factors*	Emergency food aid: general food ration Blanket supplementary feeding Therapeutic feeding of severely malnourished individuals
Acute malnutrition rate 10-14% OR 5%-9% with aggravating factors*	No general rations Targeted supplementary feeding Therapeutic feeding of severely malnourished
Acute malnutrition rate < 10% with no aggravating factors	No emergency food and nutrition intervention

Aggravating factors include the following:

- Household food insecurity;
- High prevalence of HIV/AIDS;
- Crude mortality rate greater than 1/10,000/day;
- Under-five crude mortality rate greater than 2/10,000/day;
- Epidemic of measles or whooping cough (pertussis);
- High prevalence of respiratory or diarrhoeal diseases;
- High prevalence of pre-existing malnutrition, e.g., underweight and/or stunting.

Any cases of scurvy, pellagra or beriberi that occur during the emergency response phase should be reported. Monitoring of aggravating factors is also part of nutrition monitoring.

Data should be analysed and interpreted locally and appropriately compiled and analysed at the regional and national levels.

Sphere project standards

Programmes should be planned and evaluated using the internationally agreed Sphere Project standards for food aid, nutrition and food security (see next section). The Sphere Project, launched by the International Federation and humanitarian NGOs, has developed standards for humanitarian relief to promote accountability by relief agencies in emergency situations. The standards, which are qualitative, specify minimum levels for the emergency response and are used for planning, monitoring and evaluating the adequacy of the emergency response.

Food aid standards

1. General food rations are based on nutrition requirements. Rations should make up the difference between average nutrition requirements and what people can provide for themselves;
2. Rations reduce or eliminate the need for coping strategies;
3. The economic transfer value of the ration is calculated where rations might be traded;
4. The target population is consulted on the cultural acceptability of food items;
5. If an unfamiliar food is distributed, instructions on its preparation are provided;
6. Access to fuel and water are considered when selecting commodities;
7. Beneficiaries have access to milling facilities when whole grain cereals (e.g., maize) are distributed;
8. Beneficiaries have access to condiments and other culturally important food items;
9. Milk is not distributed;
10. Food commodities conform to national and international standards;
11. All imported packaged food has a shelf life of six months and is distributed before the expiration date;
12. There are no verifiable complaints about the quality of food;
13. Food packaging is sturdy;
14. Packaged foods are labelled in an appropriate language with the date of production, expiration date and nutrient content;
15. Storage conditions are dry, clean, protected from weather, uncontaminated and secure from pests;
16. There are no adverse health effects resulting from food handling or preparation at any distribution site;
17. Beneficiaries are informed about food hygiene;
18. There are no complaints about storing, preparing, cooking or consuming the food distributed;
19. All households have access to cooking utensils, fuel, cooking water and soap;
20. Individuals who cannot prepare food or cannot feed themselves have access to a caregiver;
21. Food aid reaches the targeted beneficiaries;
22. Supply chain management is assessed and an efficient system is established, using local capacity where feasible;
23. The above assessment considers the availability of local food commodities;
24. The award of contracts is transparent and fair;
25. Staff at all levels is adequately trained and observes food safety and quality procedures;
26. Inventory, reporting and financial systems are in place to ensure accountability at all levels;
27. Care is taken to minimise losses, including theft; all losses are accounted for;
28. The food pipeline is monitored to avoid interruption in distribution;
29. Information on food supplies and operations is provided to stakeholders and beneficiaries on a regular basis;
30. Beneficiaries are identified and targeted on the basis of need through consultation with stakeholders and the community;
31. Efficient and equitable distribution is designed in consultation with local groups and organisations and the community;
32. The point of distribution is as close as possible to beneficiaries' homes to ensure access and safety;

33. Beneficiaries are informed in advance of the quality and quantity of the food ration and the distribution plan;
34. The performance and adequacy of the food aid programme are monitored and evaluated.

Nutrition standards

1. Emergency affected populations have access to a staple, pulses or animal food sources and fat food sources that meet nutritional requirements; vitamin A-rich, vitamin C-rich and iron-rich or fortified foods; iodised salt; niacin-rich foods (e.g. pulses, nuts, dried fish) if the staple is maize or sorghum; thiamine-rich foods (e.g. pulses, nuts, eggs) if the staple is polished rice; and riboflavin-rich foods when the diet is limited;
2. Levels of moderate and severe malnutrition are stable at or declining to pre-emergency levels;
3. There are no cases of scurvy, pellagra, beriberi or riboflavin deficiency;
4. Vitamin A deficiency and iodine deficiency are controlled by high-dose supplementation in target populations, salt iodisation and public awareness;
5. Infants under six months are exclusively breastfed;
6. Children six to twenty-four months are breastfed and have access to adequate complementary foods;
7. Pregnant and breastfeeding women have access to supplementary food when the general food ration is inadequate; nutritional support should be provided to adolescent girls when feasible;
8. Health professionals, caregivers and relevant organisations are provided information and training about infant and young child feeding practices;
9. Older people have access to food and nutritional support;
10. Persons living with HIV/AIDS and the chronically ill and disabled have access to food and nutritional support;
11. Community-based systems are in place to care for vulnerable individuals;
12. Objectives and criteria for closure of supplementary and therapeutic feeding programmes are set;
13. Supplementary feeding programmes are short-term and implemented only when the general food ration is adequate and nutrition surveys have been conducted;
14. Coverage of supplementary and therapeutic feeding programmes is >50% in rural areas, >70% in urban areas and >90% in camps;
15. More than 90% of the target population is within a one-day walk of the distribution site for supplementary food;
16. The proportion of exits from supplementary feeding who recover is >75%, who default is <15% and who die is <3%; the proportion of exits from therapeutic feeding who recover is >75%, who default is <15% and who die is <10%. Children who exit therapeutic feeding are referred to supplementary feeding programmes;
17. Admission to supplementary feeding is based on international reference standards for weight-for-height;
18. Targeted supplementary feeding is linked to health facilities and protocols are followed to identify health problems and for referral;
19. Supplementary feeding is dry take-home unless there is a rationale for on-site feeding;

20. Discharge criteria from therapeutic feeding include good appetite and absence of illness and untreated infections;
21. Mean weight gain is >8 g/kg of body weight/day; nutritional and medical care is provided according to international protocols;
22. Attention is paid to breastfeeding, psychosocial support, hygiene and community outreach;
23. Constraints on caring for malnourished individuals and family members should be addressed;
24. All clinical cases of micronutrient deficiencies are treated according to WHO supplementation protocols;
25. Micronutrient deficiencies are prevented in populations at risk;
26. Health staff is trained how to identify and treat micronutrient deficiencies for which populations are at risk.

Recovery and household food security

Food security and nutrition policies

Direct food aid should be short term. Long-term relief aid is not only creating dependency and expensive, but it might also have a negative impact on local agricultural production and economic development as well as increase population displacement. Prolonged food aid is also inappropriate and ineffective for promoting the recovery of the emergency affected population. The priority should shift from direct food aid to development programmes as soon as possible to improve long-term household food security.

The speed of recovery from an emergency depends on the health status of the target population, the capacity to produce food and/or engage in other income-generating activities, the security situation and public policies. Crises are aggravated by underlying causes of malnutrition: chronic food insecurity, chronic disease (HIV/AIDS) and chronic malnutrition. Food-insecure, marginal populations faced with drought, floods or economic shocks are much more vulnerable to food and nutrition emergencies. Food security and nutrition policies can reduce these vulnerabilities. Therefore, once the immediate food and nutritional needs of the target population have been addressed, all emergency efforts should include plans for protecting and re-establishing the food security and livelihoods of the affected population through agricultural, economic and health and nutrition policies to reduce poverty and vulnerability to famine. Food and nutrition emergencies often focus the attention of national and local policymakers on food security and nutrition.

Since 2003, an outreach programme strategy has been providing millions of Ethiopian children in drought-prone areas a package of health and nutrition services at regular intervals, including vitamin A supplementation, de-worming medicine, measles vaccinations, screening for acute malnutrition and referral to supplementary and therapeutic feeding programmes.

Household food security interventions

As populations recover from a food and nutrition emergency, assistance to food-insecure households and areas should be provided. Household food security interventions address primary production factors: inputs such as seeds, tools, fertiliser, livestock, fishing and hunting equipment, loans and credit; market information; transport facilities; training; and access to markets, natural resources and extension services.

Table 9-26: Sphere project standards and indicators for food security

Standard/intervention	Indicators
Protection and support of primary production	<p>Interventions are based on an understanding of the viability of production systems including access and availability of inputs and services.</p> <p>New technologies are introduced only when implications for local production systems are understood and accepted by food producers;</p> <p>A range of inputs is provided to producers for flexibility in managing production, processing and distribution;</p> <p>Production inputs conform to quality norms;</p> <p>The introduction of inputs and services does not exacerbate vulnerability or increase risk by increasing competition for natural resources or damaging social networks;</p> <p>Inputs and services are purchased locally unless this adversely affects local producers, markets or consumers.</p>
Access to income-generating opportunities and fair remuneration	<p>Project decisions are made based on an understanding of local human resource capacity, market and economic analysis and demand and supply for skills and training;</p> <p>Jobs and income opportunities are technically feasible and inputs are available on time;</p> <p>Remuneration is appropriate and payments are timely;</p> <p>The work environment is safe and secure;</p> <p>Labour opportunities protect household caring responsibilities and do not negatively affect the environment or interfere with other livelihood activities.</p>
Access to markets and services by producers and consumers	<p>Activities are based on an understanding of local markets and economic systems and lead to system improvement and policy change when necessary;</p> <p>Producers and consumers have access to markets, supply of basic items and food at affordable prices;</p> <p>There is information about market prices and markets and the policies that govern them;</p> <p>Extreme seasonal and other price fluctuations are minimised.</p>

Essential nutrition actions

National health authorities and NGOs play an important role in providing nutrition services in health centres and in the community to prevent and treat malnutrition among children under five, women of childbearing age and other target groups such as persons living with HIV/AIDS during emergencies and non-emergencies alike. Therapeutic and supplementary feeding programmes should be integrated into community health programmes that offer health and nutrition services such as immunisations, nutrition and health education and growth monitoring.

Key nutrition outcomes that promote growth and prevent illness and death in a wide range of countries and contexts are as follows:

- Exclusive breastfeeding for at least four months and up to six months;
- Appropriate complementary feeding and continued breastfeeding for two years;
- Adequate nutritional care during illness and severe malnutrition;

- Adequate vitamin A intake;
- Adequate iron intake;
- Adequate iodine intake.

Activities that national governments and NGOs can implement in support of these outcomes are summarised in Table 9-27. Outreach strategies such as Child Health Week to increase access to vitamin A supplementation and other preventive services for preschool-aged children can serve as a safety net for children at risk.

Table 9-27: Activities to support key nutrition outcomes⁴³

Outcome	Activities
Exclusive breastfeeding	<p>Support the Breastfeeding Friendly Hospital Initiative and the International Code for Marketing of Breast milk Substitutes;</p> <p>Train health staff in breastfeeding counselling (WHO/UNICEF);</p> <p>Reach out to all women during pregnancy, at delivery and postpartum through women's groups, breastfeeding support groups and traditional birth attendants;</p> <p>Increase community awareness of exclusive breastfeeding in the community through communication activities;</p> <p>Include the lactational Amenorrhoea method in all family planning activities.</p>
Feeding children 6-24 months old	<p>Identify problem areas that affect the growth and feeding of children six to twenty-four months. Use local feeding recommendations;</p> <p>Support community health workers to assess and counsel on feeding practices;</p> <p>Train and supervise health workers to train and support caregivers and community groups on feeding well children, sick children and convalescing children as well as breastfeeding. Refer families who need social support, including HIV-positive mothers;</p> <p>Increase community awareness of appropriate infant and young child feeding practices in the community through communication activities.</p>
Sick and malnourished children	<p>Support breastfeeding of all sick children up to twenty-four months of age;</p> <p>Support feeding during illness and increase variety, frequency and amounts after illness;</p> <p>Use health protocols (Integrated Management of Childhood Illness) for assessment and treatment at health facilities;</p> <p>Identify local perceptions and caring practices for sick and malnourished children and use this information in counselling;</p> <p>Establish at least one high-quality unit for treating severely malnourished children to serve as a referral facility for the administrative area.</p>
Vitamin A intake	<p>At all health contacts, encourage the daily intake of vitamin A-rich foods by young children and women;</p> <p>Encourage breastfeeding;</p> <p>At all sick-child contacts give high-dose vitamin A supplements to children with measles, severe malnutrition, prolonged diarrhoea and other infections;</p> <p>Train health staff to detect and treat clinical vitamin A deficiency with high-dose vitamin A;</p> <p>Implement preventive supplementation for children six to fifty-nine months every four to six months in areas where deficiency is known to be a public health problem.</p>

Outcome	Activities
Iron intake	<p>Train health workers and community health workers to detect severe anaemia and to give iron supplements to young children and pregnant women presenting with severe anaemia;</p> <p>Ensure supply of iron supplements;</p> <p>Promote the consumption of iron-rich food, vitamin C-rich foods and iron-fortified foods (except formula, which tends to replace breast milk) by women of reproductive age, infants and young children;</p> <p>Strengthen preventive measures such as malaria bed nets and de-worming.</p>
Iodine intake	<p>Ensure that only iodised salt is sold in the community by increasing awareness among salt suppliers, consumers and local authorities;</p> <p>Teach community health workers how to test salt for iodisation.</p>

Nutrition support for persons living with HIV/AIDS

HIV infection increases energy requirements and decreases food intake and weight loss and wasting in children and adults and growth failure in children are common. Malnutrition depresses the immune response of HIV-positive individuals including CD4 T-cell counts, delayed hypersensitivity and B-lymphocyte immune responses. Diet counselling can improve compliance with antiretroviral drugs and other medicine to treat HIV-related infections and can help individuals maintain their food intake.

Good nutrition is important for persons living with HIV/AIDS because:⁴⁹

- Good nutrition helps keep the immune system strong;
- A healthy diet improves quality of life;
- Malnutrition can contribute to disease progression;
- Good nutrition helps the body process medications taken by people with HIV;
- Diet may help with symptoms such as diarrhoea, nausea and loss of appetite.

Persons living with HIV/AIDS should eat a regular diet consisting of staples, legumes, animal food sources, fat and oil and fruits and vegetables. HIV-infected asymptomatic persons need 10% more energy and HIV-infected symptomatic persons need 20% to 30% more energy. Body weight, measured by a Body Mass Index of at least 18.5, should be maintained.

Because persons living with HIV/AIDS are more vulnerable to infection, proper food and water handling is especially important to avoid infections caused by contaminated food and water.

Table 9-28: Guidelines for food handling and water and hygiene

Water	Be sure water is clean. Keep boiled water stored in a clean container with a lid. Do not dip hands or cups into the container; instead pour water from the container. Use a tap if possible. Always wash hands with soap before and after handling foods and using the toilet/latrine.
Animal food sources	Cook all animal food products thoroughly. Do not eat raw eggs. Thoroughly wash hands and surfaces that have touched uncooked meat before handling other foods. Cover foods. Keep foods separate from other foods.
Fruits and vegetables	Use clean water to wash all fruits and vegetables to be eaten raw. Remove the skin if possible. Remove any bruised parts. Boil vegetable thoroughly but do not overcook which will cause vitamin loss.
Hygiene	All food preparation and eating area should be free of flies and other insects. Use clean dishes and utensils. Keep hot food hot before eating. Avoid storing leftovers unless they can be refrigerated. Always re-heat at a high temperature. Avoid eating street food and foods purchased from vendors in the marketplace. Washing clothes, bedding and surfaces that might have been contaminated by faeces with hot water and soap.

Table 9-29: Selected care practices for symptoms associated with HIV⁴⁸

Symptom	Care practices
Diarrhoea	Drink plenty of fluids. Avoid citrus juices that might irritate the stomach. Consume foods rich in soluble fibre (millet, banana, peas and lentils) that help retain fluids. Boil or steam foods. Eat fermented foods such as porridge and yogurt. Eat small amounts of food frequently. Eat soft fruits and vegetables. Avoid milk, caffeine and fatty foods.
Nausea	Eat small and frequent meals. Eat lightly salted and dry foods such as crackers. Drink fluids. Rest between meals but do not lie down immediately; wait at least twenty minutes. Avoid spicy and fatty foods, caffeine and alcohol. Avoid having an empty stomach.
Weight loss	Increase food intake by increasing portion size and meal and snack frequency. Increase intake of animal food sources.
Loss of appetite	Eat favourite foods. Eat small amounts of food frequently. Select energy dense foods. Avoid foods with strong smells.

Food security of HIV/AIDS-affected households

Food aid can help mitigate the impact of HIV/AIDS on household food insecurity and improve the dietary intakes of persons living with HIV/AIDS by providing them with nutrition education. Food assistance is increasingly being provided to those widowed or orphaned by AIDS and all vulnerable children. USAID has Title II programmes in Africa and Haiti to assist households affected by HIV/AIDS.

Interventions to mitigate the effects of HIV/AIDS on food security include the following:

- Introduction of less labour-intensive food production, food processing and food preparation methods;
- Microcredit to help households manage their cash needs to buy food, medicine and agricultural supplies and to protect assets and safeguard livelihoods;
- Vocational training to expand income-generating and employment options for individuals affected by HIV/AIDS, particularly orphans;
- Agricultural extension to help increase food production, especially for women;
- Training of agricultural extension agents to increase awareness of HIV/AIDS and its socioeconomic impact on households and the community;
- Community support for reducing social stigma around households affected by HIV/AIDS.

In 2006 the World Food Programme in northern Ethiopia (Amhara) started distributing food aid to households affected by HIV/AIDS and to orphaned and vulnerable children.

HIV/AIDS is largely an urban problem in Ethiopia that results in the impoverishment of many households. In 2002 in one neighbourhood in Addis Ababa, a community vegetable garden was created by a women's community group with the support of local government and local technicians, providing much-needed income for food-insecure households.

Table 9-30: Food security interventions for HIV/AIDS: affected households²

Intervention	Activities
Less labour	Livelihood strategies that are less labour-intensive; Shared care giving of persons living with AIDS; Agricultural practices that reduce labour requirements; Food processing technologies that reduce labour requirements.
More cash	Cultivation of crops requiring less inputs; Gathering of wild foods; Provision of grants for animal purchase or rental; Provision of micro-finance for operating expenses; Improvements in food storage and preservation; Support for local market development; Pay cash-for-work vs. food-for-work.
Asset protection	Provision of grants for assets, e.g., small animal husbandry; Replanting of community forests; Investment in community-owned assets e.g. ploughs, draught animals; Provision of grants for asset protection.
Increased knowledge and skills	Dissemination of new labour-saving agricultural technologies and practices; Increased awareness of HIV/AIDS prevention and care; Support for communities to share practical experience with HIV/AIDS affected households; Creation of incentives for school attendance; Provision of business and management training for HIV/AIDS affected households and community groups.
Local institution building	Support for communal food and cash crop production; Support for the protection of community assets and infrastructure; Improvements in community health, e.g. sanitation, to reduce morbidity; Provision of legal aid to HIV/AIDS affected households.