

FOOD AND NUTRITION

Description

This chapter reviews the impact of disasters on food and nutrition and the principles of food aid. It provides basic guidelines for assessing food security and nutritional status during humanitarian emergencies. It also describes various food aid strategies for reducing malnutrition and micronutrient deficiency diseases among the displaced.

Learning Objectives

- To identify the common issues surrounding food and nutritional emergencies.
- To define the causes of malnutrition and micronutrient disorders.
- To review the principles of food and nutritional interventions in emergencies.
- To identify indicators for nutritional surveillance.
- To define the special needs of refugees and design programs for addressing these needs.
- To describe different types of emergency nutrition interventions.
- To review the supply and distribution of food aid in emergencies.
- To discuss the practical approaches to fortifying relief foods.
- To monitor and evaluate food and nutrition programs.

Key Competencies

- Recognise the effect of disasters on food security and the risk factors for malnutrition in complex emergencies.
- Discuss how to treat malnutrition and micronutrient deficiency disorders.
- Understand the role of food aid in emergencies.
- Describe different methods of assessing food security and nutritional status in emergency situations.
- Design short-term and long-term food and nutrition programs.
- Understand the criteria for establishing and closing selective feeding programs.
- Describe ways of overcoming problems of food supply and distribution for large displaced populations.
- Recognise the advantages of field-based fortification.
- Define indicators for monitoring and evaluating food and nutrition programs.

TABLE OF CONTENTS

Food Security and Nutrition Issues in Emergencies	6-3
Introduction	6-3
Food Security in Famine, Drought, and Conflicts	6-6
Malnutrition, Displacement, and Increased Mortality.....	6-7
Malnutrition and Micronutrient Deficiencies	6-9
Causes of Malnutrition.....	6-9
Effects of Malnutrition and Micronutrient Deficiencies	6-12
Management of Malnutrition and Micronutrient Deficiencies	6-15
Principles of Food Aid and Nutrition	6-17
Overview of Emergency Nutrition Programs.....	6-22
Direct Food Aid.....	6-22
Other Emergency Interventions.....	6-25
Nutritional Assessment and Surveillance	6-26
Nutritional Assessments	6-26
Nutritional Surveillance.....	6-29
Planning Emergency Food and Nutrition Programs.....	6-31
Assessment.....	6-31
Identify Problems and Priorities	6-33
Define Strategies for Promoting Access to Food	6-34
Set Program Goals and Objectives.....	6-35
Identify Resources for Emergency Nutrition Programs.....	6-36
The Logistics of Food Aid in Emergencies	6-41
Food Logistics Systems.....	6-41
Challenges to Food Aid.....	6-41
Long-Term Food Interventions.....	6-43
Indirect Food Aid	6-43
Fortification of Relief Foods	6-45
Monitoring and Evaluating Food and Nutrition Programs.....	6-46
Monitoring Food Aid	6-46
Monitoring Emergency Nutrition Programs	6-47
Evaluating Food and Nutrition Programs.....	6-47
Appendix.....	6-50
References and Suggested Readings	6-53

Overview

Of all the deaths that occur in major humanitarian emergencies, between 33% and 50% are associated with malnutrition. Particularly in emergencies where there are many deaths, the mortality rate is closely associated with the severity of malnutrition.

Malnutrition is already the highest risk factor for illness and death in Africa. Four to five million children die in Africa each year from malnutrition-related problems. These deaths are not due to man-made or natural emergencies, but because of a combination of factors, such as gross poverty and gross under-development in the form of high illiteracy, unclean water, and inadequate health facilities.

Not surprisingly, food and nutrition programs cost up to 50% of the budget for humanitarian aid. The cost of transporting bulk food exceeds the costs of health, shelter, and water and sanitation programs combined.

This chapter reviews food security and nutrition problems in emergencies and focuses on how to use food aid to reduce malnutrition. It is structured around the planning cycle.

FOOD SECURITY AND NUTRITION ISSUES IN EMERGENCIES

Introduction

The right to food is more critical than almost any other human right. Food is usually the last thing that people will give up when they have to make economic decisions. This is because without food, you die.

Food security means all people having access at all times to the food needed for an active and healthy life. Three things are required for overall food security:

1. Adequate and stable food availability or a consistent food supply in the affected area.
2. Food access, or the ability of the displaced population to get to the food and be able to afford it.
3. Bio-utilisation, or the body's ability to properly eat, digest, absorb, and metabolise the nutrients in food. This is often compromised by weakness (which reduces appetite), fever (which increases both caloric and protein requirements), and parasite load (which can deplete the body's nutrients).

It has been recognised that there is enough food to feed everyone in the world, but some people do not have access to it. This lack of access, or *food insecurity*, may exist at any level: the national, community, or household level. When a large number of people experience food insecurity, a *food emergency* may occur. In most cases, a food emergency is not a sudden event, but one that develops over time. A food emergency is not common during natural disasters that occur suddenly, such as earthquakes or hurricanes.

Decreased rainfall may be one of the early signs of a food emergency, followed by a decline in food supply and an increase in food prices. Many families may be forced to sell their household assets (e.g., some livestock and tools) to buy grain. Selling critical household assets may gradually lead to a loss of livelihood and a large-scale population displacement. The final stage of a food emergency is a *nutritional emergency* in which reduced access to food is associated with actual or threatened increases in morbidity and death.

Table 6-1: Terms and Definitions

Anaemia	A condition in which the haemoglobin in blood is lower than normal. May be caused by disease or a deficiency of one or more essential nutrients, such as iron and folate.
Anthropometric Indicators	Measurements of the body (e.g., height, weight, age, and arm circumference) compared to similar measurements of a reference population to indicate nutritional status, for example: <ul style="list-style-type: none"> • Height for Age (HFA) • Weight for Age (WFA) • Weight for Height (WFH) • Mid-Upper Arm Circumference (MUAC) • Birth Weights • Body Mass Index (BMI)
Average Dietary Energy	The average number of calories needed to sustain normal levels of activity and health, taking into account age, sex, body weight, and climate. On average, about 2,350 calories are needed by each adult per day.
Blended Foods	A mixture of foods (e.g., cereals, pulses, oilseeds, soya beans or vegetable oil, and sugar) that have been milled, cooked and fortified, for example: Corn-Soya Blend (CSB), Wheat-Soya-Blend (WSB), UNIMIX.
Breast Milk Substitutes	Any foods used to fully or partially replace breast milk.
Drought	A condition of climatic dryness severe enough to reduce soil moisture and water supplies below the minimum necessary for sustaining plant, animal, and human life.
Famine	A condition of a population in which a substantial increase in deaths is associated with inadequate food consumption.
Food Access	The availability of enough food (through production, markets, gathering in the wild, gifts, etc.) and people's ability to acquire it (through their own labour, purchase, exchange, etc.). Access is central to food security (defined below) and should account for seasonal variation and supply mechanisms.
Food Availability	Sufficient quantities of appropriate and necessary types of food from domestic production, commercial imports, or donors that are consistently available to individuals or are within their reach.
Food Basket	A collection of food items that make up the rations for a particular general feeding program. Consists of the following: <ul style="list-style-type: none"> • Basic foods — foods that supply most of the energy, protein, and fat in the ration. • Complementary foods — food commodities that add nutrients, taste, and variety to basic foods and enable people to make or improve their traditional foods.
Food Security	Access by all people at all times to enough food for an active and healthy life. Its essential elements are the availability of food and the ability to acquire it.
Food-for-Work Programs	Projects that pay people with food for working on public works or community-development projects.
Fortification	Adding one or more nutrients to foods to restore or enhance the quality.
General Ration	A complete basket of food commodities given in sufficient quantities to families to meet their basic nutritional requirements. Estimated as average dietary energy (kilocalories/person/day).
Growth Monitoring	Following a child's growth by regular weighing, plotting the weight on a growth chart, and comparing the child's rate of weight gain with weight gains of reference children.
Household	A group of people who eat from the same pot. Usually contains a family, i.e., the people related by blood or ritual (e.g., marriage). May include people who are not members of the family.
Kwashiorkor	A severe form of malnutrition, attributed to inadequate protein intake and/or the stress of infection. It is characterised by oedema, flaking, skin lesions, hair changes, and enlarged liver.

Malnutrition	A condition in which health is impaired due to a lack (undernutrition), imbalance, or excessive intake of one or more nutrients. It may be expressed in many forms, including wasting, stunting, nutritional oedema, and micronutrient deficiencies.
Malnutrition Rate	The proportion of children aged 6 months to 3 or 5 years whose weight falls below -2 Z scores or 80% of the reference value.
Marasmic Kwashiorkor	Mixed type of undernutrition with oedema, gross wasting, stunting, and mild liver enlargement.
Marasmus	Severe deprivation of energy and protein, resulting in severe weight reduction, muscle and subcutaneous tissue wasting, marked stunting, apathy, and irritability.
Micro-Nutrient Deficiency Disorder	A condition resulting from a lack of certain vitamins or minerals, for example: <ul style="list-style-type: none"> • <i>xerophthalmia</i> — vitamin A • <i>beriberi</i> — vitamin B1 • <i>pellagra</i> — vitamin B3 (niacin) • <i>scurvy</i> — vitamin C • <i>anaemia</i> — iron or folate • <i>rickets</i> — vitamin D • <i>goitre</i> — iodine
Nutrients	Parts of food that can be absorbed and or used by the body, such as carbohydrates, proteins, fats, vitamins, and minerals. They are essential for human growth and development.
Nutritional Emergency	When a population has reduced access to food, associated with actual or threatened increases in morbidity and mortality.
Nutritional Surveillance	The continuous or periodic collection of agricultural and economic information, as well as anthropometric data.
Oedema	Abnormal collection of water in the interstitial space, often on the upper surface of the foot. Usually diagnosed as pitting oedema. A key clinical sign of kwashiorkor.
Ration	The amounts and types of foods specified per person per day.
Social and Care Environment	The social environment within the household and local community that directly affects the ability of a family and individual family members to care for themselves and ensure good nutrition.
Stunting (chronic malnutrition)	Low height for age. Height (or length) is below the normal range of healthy (reference) children of the same age.
Supplementary Feeding	Distributing extra food, in addition to the general ration, to selected groups who are malnourished or at risk of malnutrition, e.g., young children, pregnant or nursing mothers, the elderly, and those with chronic diseases.
Sustainable Development	The reduction of hunger and poverty in environmentally sound ways, e.g., meeting basic needs, protecting and enhancing the environment, expanding economic opportunities, and promoting pluralism and democratic participation in a way that can be maintained.
Therapeutic Feeding	Special feeding of severely malnourished individuals under medical supervision.
Undernutrition	Condition resulting from lack of nutrients in which normal activity, growth, and protection from disease is impaired.
Wasting (acute malnutrition)	Low weight for height. Weight is below the normal range of weights for healthy reference children (aged 6-59 months) of the same height (or length).
Weaning	Familiarising a child to foods other than breast milk or formula.
Z-Score	Expresses a child's weight as a multiple of the standard deviation of the reference population. This is statistically a more accurate indicator than a percentage of the median height or a percentage of the reference population.

Food Security in Famine, Drought, and Conflicts

The type of emergency and context will determine the rate of onset and severity of food insecurity.

Famine

A **famine** is a condition of a population in which a considerable increase in deaths is associated with inadequate food consumption. Most famines occur when large numbers of people in a region, who are already undernourished, cannot obtain enough food. The problem is often economic and political, rather than a shortage of food supply. Causes of famine include:

- War, civil conflict, or social upheaval.
- Failure of a harvest due to climatic or other environmental conditions, such as drought, flood, wind, or insect infestation (usually locusts).
- Disruption or collapse of the food-distribution network and/or the marketing system, affecting a significant percentage of the population. This may be the result of a political, economic, or environmental crisis.
- Lack or disruption of an emergency food-support system that ensures the rural poor have access to food during shortages.

The consequences of famine may be physiological, psychological, or social, as follows:

- *Physiological* — a significant increase in deaths, which is mainly due to malnutrition, diarrhoea, and measles.
- *Psychological* — altered patterns of behaviour. All thoughts and activities are directed toward seeking food, resulting in the sale and consumption of assets. People become more depressed and apathetic. Relief aid that goes on for a long period of time can make people unmotivated to return to agricultural production.
- *Social* — weakened family ties as some members leave home to search for food, and mass migration as the situation worsens. Social bonds grow weak as people begin to care only for themselves. Traditional leadership becomes threatened.

Note: *Malnutrition is a risk factor that emerges over time. It will be more severe and cause higher death rates if the emergency-affected population had a high malnutrition rate before the emergency onset. In famines, it is uncommon for peak mortality to occur before the second year of a prolonged food shortage.*

Drought

A **drought** is any unusual, prolonged dry period that is severe enough to reduce soil moisture and water supplies below the minimum level necessary for sustaining plant, animal, and human life. Droughts may occur as a result of human activities such as overgrazing, poor cropping methods, and improper soil conservation measures. The effects of drought may be immediate or secondary:

- Immediate* — occurs due to overtaxing and drying up of water supplies; this results in loss of crops, livestock, and other animals and no water for washing, bathing, and drinking.
- Secondary* — occurs due to a depletion of crops and grazing for livestock
 - Causes temporary migration of families to areas with better grazing for remaining livestock, or to cities for alternative sources of income.
 - Famine may develop if depleted food supplies are not replaced.
 - Prolonged droughts may result in permanent changes in settlement, social, and living patterns.

- Major ecological changes, e.g., desertification, flash flooding, and soil erosion.

Conflicts and Complex Emergencies

A greater share of the world's hunger and malnutrition occurs in countries with large numbers of uprooted people and civilian populations cut off from markets and aid due to violent conflict. Many famines have been triggered by conflicts and war in recent decades. On the other hand, conflicts can create famine as well as disrupt famine-relief operations in the following ways:

- by disrupting the agricultural cycle
- by driving farmers from the land
- by interfering with the marketing processes
- by destroying stores of harvested foods
- by creating food shortages that drive prices to levels that low-income families cannot afford to pay
- by decreasing access to displaced persons

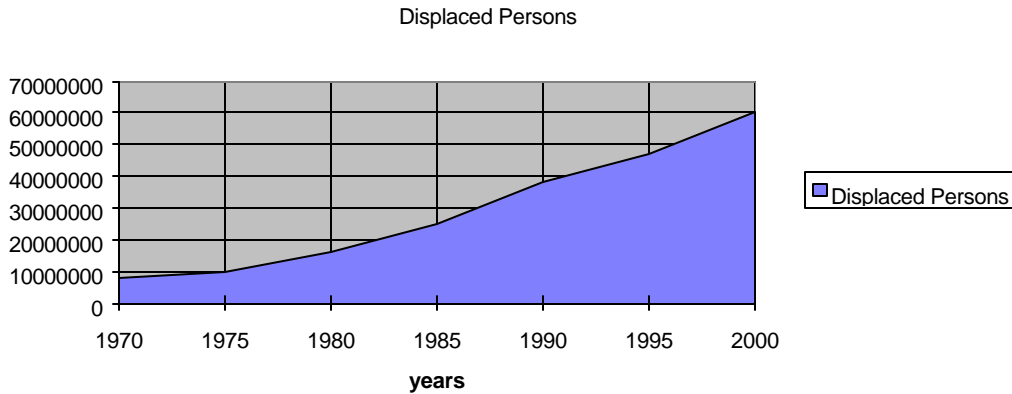
Complex emergencies may be caused by multiple factors, e.g., war and drought in Ethiopia, Mozambique, and Somalia. Refugees and *internally displaced persons* (IDPs) have a high risk of becoming malnourished because they are cut off from their local food stocks and are restricted from growing foods in the areas to which they flee. The risk of malnutrition is even greater among children who become separated from their families. Access to stable diets becomes a problem for these children, particularly for infants. In addition, their survival is at risk due to high levels of violence and outbreaks of diseases such as measles, tuberculosis, malaria, and respiratory infections. This results in high death rates among populations affected by complex emergencies. In recent years, between 200,000 and 300,000 displaced people died each year from preventable causes because they were denied access to basic health services, shelter, and food.

Malnutrition, Displacement, and Increased Mortality

Alone among continents, Africa's nutritional status has not improved, according to WHO data. Due to the population increase, the absolute number of underweight children has grown from 28.8% (19.9 million) to 29.9% (28.2 million).¹ In addition, Africa's agricultural production has lagged behind the other regions of the world. Between 1989 and 1990, almost the entire African continent experienced a decline in coarse grain production ranging between 5-20%.

Over the past 25 years, the number of people in sub-Saharan Africa with inadequate access to food has doubled to 215 million.² Because Africa is home to at least half of the world's complex emergencies today, it suffers a disproportionate burden of related famine. The biggest killer in emergencies is either child malnutrition recorded as a direct cause of death or malnutrition as a cause of increased vulnerability to infection.

Figure 6-1: Number of Displaced Persons Over Last 30 Years



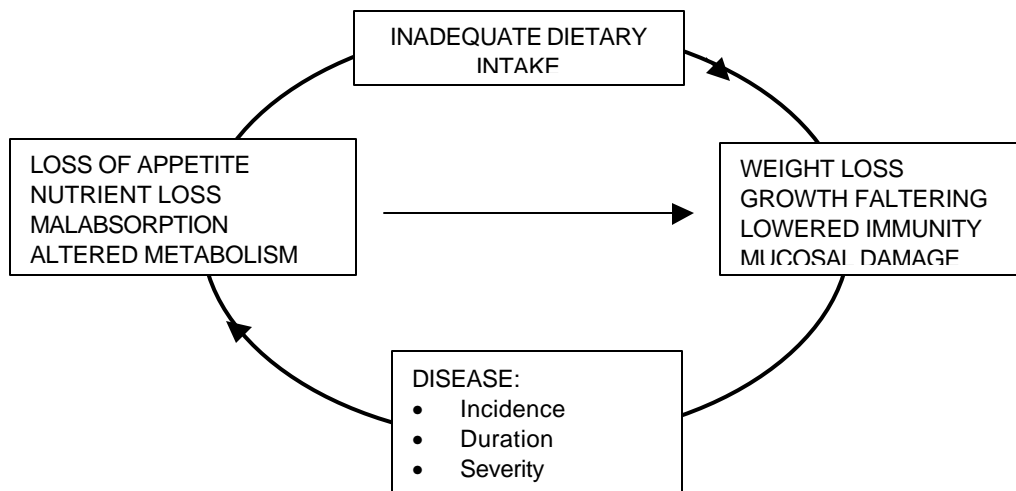
Some historians feel that malnutrition problems increased whenever human populations swelled without an increase in food production. For example, populations in Ireland swelled as large amounts of potatoes were harvested. However, large supplies did not mean stable supplies, and the Irish food and economic system did not have any fallback provisions. So, when the potato crop suffered, massive levels of malnutrition and hunger-related deaths occurred. The same scenario appeared whenever populations in the past swelled, or moved to urban areas because they relied on only one crop, e.g., as in the Middle East. In the Old Testament, drought and pestilence wiping out grain crops brought on famine. This consequence is less common where the basis of livelihood is more varied, as in pastoral herding societies or in hunter gathering societies (the Kung bushmen of southwest Africa appear to rarely suffer food stress).

Heightened Deaths from Preventable Diseases

Death rates of displaced populations may be ten to twenty times higher than death rates for the same populations during normal times. These extraordinarily high mortality rates are often observed during the first few months of displaced people arriving in camps. Many Rwandan refugees died within the first weeks of their flight from Rwanda to Zaire, as well as numerous other displaced populations including the Southern Sudan and Ethiopian refugees.

There is a strong link between malnutrition and infections such as measles, diarrhoeal diseases, and acute respiratory infections. Severe malnutrition, including micronutrient deficiencies, increases the incidence, duration, and severity of infection, while frequent infections often lead to malnutrition. The relationship between nutritional status and the incidence of infections is shown in Figure 6-2.

Figure 6-2: Malnutrition Infection Cycle



Source: Tomkins and Watson, 1989

International assistance for displaced people often encourages large refugee settlements with high population densities. However, the risk of disease epidemics with high levels of mortality is higher in large settlements, particularly among rural populations that have not been previously exposed to urban diseases. When possible, arrange for populations to receive aid at their homes, or if they are already displaced, in small camps with strong referral networks.

MALNUTRITION AND MICRONUTRIENT DEFICIENCIES

*Hunger is not caused by a scarcity of food but a scarcity of democracy.
Those who go hungry are those without a voice in their societies.*

— Frances Moore Lappe

Causes of Malnutrition

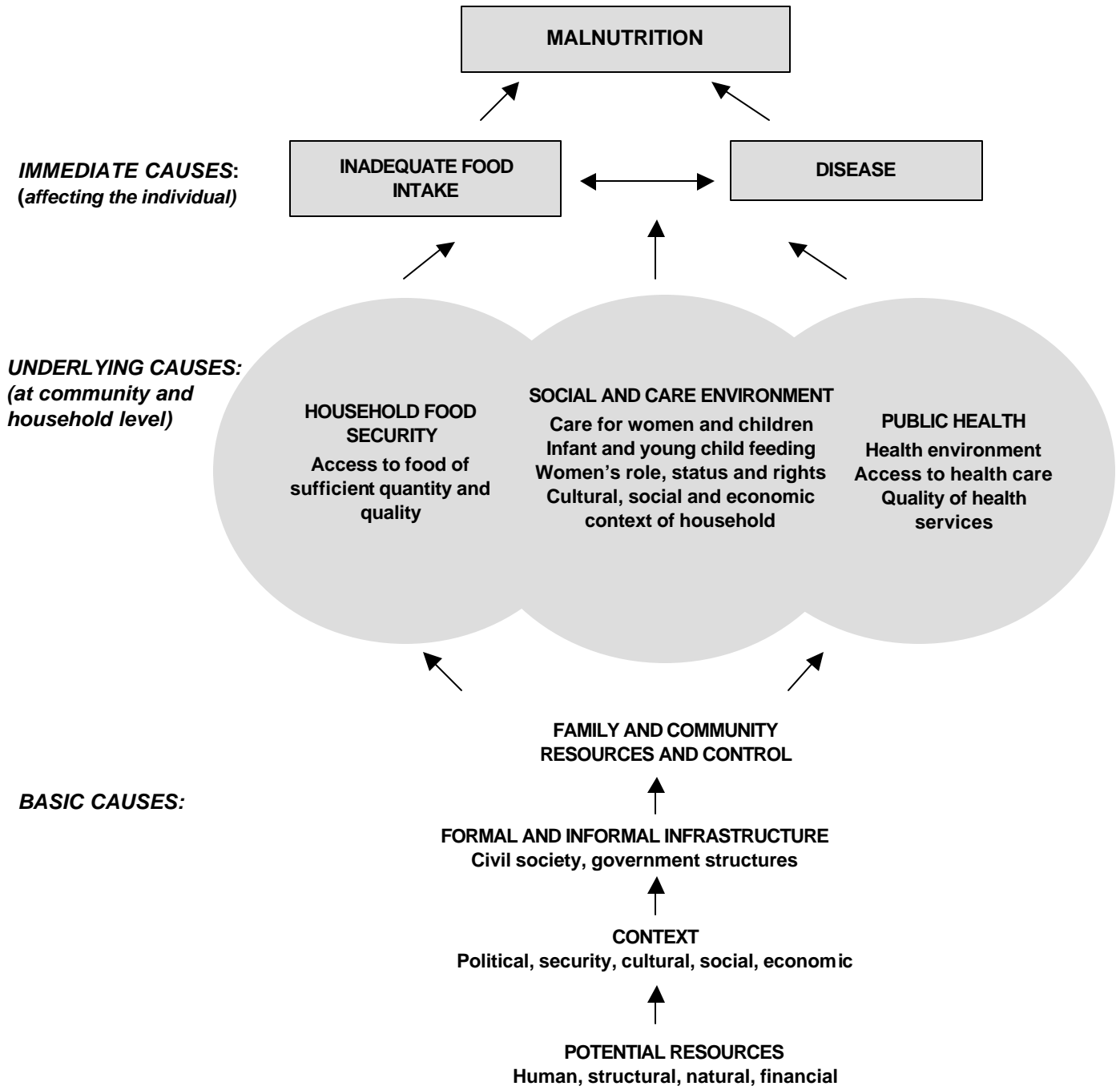
Good nutrition is vital for the body to grow, function, and resist disease. All foods contain one or more of the following **nutrients** (parts that may be absorbed and/or used by the body):

- *Carbohydrates* — a primary source of energy; found in starches, sugar, cereals, etc.
- *Fats and oils* — secondary sources of energy even if they contain more energy than carbohydrates.
- *Proteins* — essential for the body's growth and repair; found in almost all foods, especially in animal products (milk, meat, eggs, cheese, fish)
- **Micronutrients** — required in very small quantities to help the body stay alive and healthy, for example:
 - *Vitamins* — essential for adequate functioning of the body; commonly found in raw fruits and vegetables, animal products, cereals, and legumes.
 - *Minerals* — essential for the formation and function of cells in the body. Deficiencies in some minerals (e.g., iron) may be critical. Different minerals can be found in vegetables, pulses (e.g. chickpeas, soybeans), animal products, seafood, etc.

Malnutrition is a condition in which health is impaired as a result of a lack, an imbalance, or an excess intake of one or more nutrients. It is a common problem in many developing countries, even in normal situations. Anyone can develop malnutrition (including young infants, older children, adolescents, and adults), but children between the ages of 6 months and 5 years are the most vulnerable.

Malnutrition may result from a combination of factors, including political, economic, biological, social, and cultural factors. This means that poor maternal health, inadequate access to health care, lack of education, etc. may be as important in causing malnutrition and death as inadequate food intake. Figure 6-3 shows the framework of the causes of malnutrition in emergencies, defined at the individual, family, and society level.

Figure 6-3: A Conceptual Model of the Causes of Malnutrition in Emergencies



Source: Sphere Project, 2000

The following key points may be drawn from the conceptual model of the causes of malnutrition in emergencies (shown in Figure 6-3):

1. Nutrition status is the outcome of multiple processes in society.
2. Malnutrition is a result of immediate, underlying, and basic causes.
3. Access to sufficient food, adequate care of children and women, and access to basic health services, together with a healthy environment are necessary conditions for nutritional well-being.

4. The availability and control of family and community resources determine the potential for fulfilling the three necessary conditions for nutritional well-being.
5. Formal and informal infrastructure influences how resources are used in efforts to achieve the three necessary conditions.
6. The political and security context of the emergency situation depends on the availability and management of the potential resources.

Effects of Malnutrition and Micronutrient Deficiencies

Malnutrition may affect people in various ways, e.g., interfering with their normal growth and development, causing permanent disability or reducing their ability to work, learn, and enjoy themselves.

1. Wasting and/or Oedema (Acute Malnutrition)

Children with severe acute malnutrition can appear with **wasting** and/or **oedema** (accumulation of interstitial water within limb extremities). Wasting results from recent, rapid weight loss or failure to gain weight due to inadequate food intake or disease. The risk of death is high among malnourished children with oedema. The emotional and social development of these children may also be affected. The table below describes the clinical forms of severe acute malnutrition that may occur in children less than five years.

Table 6-2: Signs and Symptoms of Severe Forms of Malnutrition

SEVERE MALNUTRITION	KEY SIGNS/SYMPTOMS	OTHER SIGNS/SYMPTOMS
Marasmus	Wasting, hunger, old-man appearance	Hunger, old-man appearance
Kwashiorkor	Oedema, poor appetite, flaky paint dermatosis, moon face, sparse, loose, straight hair, irritable	Poor appetite, flaky paint dermatosis, moon face, sparse, loose, straight hair, irritable
Marasmic kwashiorkor	Wasting + oedema; Any of the above	Any of the above

Even though a significant number of older children, adolescents, and adults may be acutely malnourished, only a few may show clinical signs and symptoms. Adolescents may experience delayed growth and maturation. Malnutrition may increase the risks of pregnancy and child-birth complications in women, such as low-birth weight babies, maternal mortality, and impaired lactation. Elderly people may become more vulnerable to disability and death.

2. Stunting (Chronic Malnutrition)

Stunting may result from long-term nutrition problems that existed before the emergency. Children may look normal but have a low height for their age. By the age of two years, any deficit in height may be irreversible. Stunting in women increases the risks of childbirth complications and death of the mother and the baby.

3. Micronutrient Deficiency Disorders

Micronutrient deficiencies are other forms of malnutrition that result from lack of certain vitamins and minerals. These disorders can lead to severe disability or even death. They often co-exist with acute malnutrition but emerge only during treatment of or recovery from severe malnutrition. Crises in Africa have repeatedly led to epidemics of scurvy, pellagra, and beriberi. Even though food baskets may contain

protein, grain, and oil, they may not provide enough vitamins and minerals. As a result, the following micronutrient deficiency disorders can occur among displaced populations:

- a. **Iron deficiency anaemia:** In refugee camps world-wide, anaemia (defined as low haemoglobin levels) due to lack of iron is often recorded as one of the top medical complaints in refugee outpatient and inpatient clinics, whether in Thailand, Sudan, or Honduras. In addition to interfering with the growth of children and reducing adult work output, iron deficiency anaemia increases the risk of death during pregnancy and childbirth for millions of refugee women.
- b. **Vitamin A deficiency** is almost as widespread as anaemia, particularly among displaced populations that depend on food aid that lacks vitamin A. (Vitamin A is mostly found in meats and green leafy vegetables.) Because deficiency of vitamin A makes children vulnerable to respiratory and diarrhoeal diseases, it is a major contributor of illness and death in emergencies.
- c. **Zinc deficiency:** It is increasingly suspected that populations that mainly live on bulk grains for long periods are prone to deficiency in zinc (a mineral) that can lead to stunted growth.
- d. **Niacin deficiency, or pellagra,** is likely to occur among populations that use maize (corn) as their main food source. This is because niacin is trapped in maize and is biologically unavailable. A large pellagra epidemic in the late 1980s among Mozambican refugees in Malawi showed why paying attention to the niacin content of diets is important. Pellagra is not only associated with emergencies, but also appears regularly in maize-reliant countries in sub-Saharan Africa, from Tanzania to Mozambique.
- e. **Thiamin (vitamin B1) deficiency** is known as **beriberi**, which is observed in various refugee communities that primarily consume polished rice, without other sources of B vitamins. Because it is associated with rice-based diets, this deficiency has often been observed in emergencies that occurred in Southeast Asia.
- f. **Vitamin C deficiency, or scurvy,** is even more localised than niacin and B1 deficiencies. Almost all outbreaks of scurvy in emergencies have been reported among Ethiopian and Somalis populations, principally those who have been cut off for months from camel milk markets. Though scurvy is an obvious indicator of poor variety in one's diet, it is not considered to be a serious or life-threatening risk (unlike vitamin A deficiency).
- g. **Iodine deficiency:** Though uncommon in emergencies, iodine deficiencies may be a problem among populations living in isolated, inland or mountainous areas. Iodine deficiency is associated with a wide range of disorders, such as goitre and cretinism, which affects infants born to mothers who lack iodine. It is important for aid agencies, like WFP, UNHCR, and other NGOs to promote salt iodisation by only purchasing iodised salt for ration distributions. This can reinforce national efforts to encourage small-scale salt sellers to iodise salt as per regulations.
- h. **Other micronutrient deficiencies:** Other disorders may result from lack of other vitamins and minerals, such as the following:

osteoporosis — calcium
bleeding disorder — vitamin K

rickets — vitamin D
anaemia — folic acid or vitamin B12

The following table summarises the signs and symptoms of micronutrient deficiency disorders that may affect displaced populations. Most signs of micronutrient deficiencies are sub-clinical. So, reported epidemics may only reflect the obvious deficiencies, when actually there are many more hidden deficiencies.

Table 6-3: Micronutrient Deficiency Disorders

Micronutrient	Deficiency Disorder	Key Signs & Symptoms	At-Risk Populations
Vitamin A	Xerophthalmia	<ul style="list-style-type: none"> • Night blindness • Bitot's spots • Corneal xerosis/ulcers 	<ul style="list-style-type: none"> • Many populations in developing countries. Highest prevalence rates in SE Asia and Africa. • Displaced population reliant on food aid for many years. • Children suffering from measles, diarrhoea, respiratory infections are at increased risk.
Thiamin	Beriberi	Several syndromes: <ul style="list-style-type: none"> • Infantile beriberi: vomiting, restless, pallor • Wet beriberi: oedema, cardiac failure • Dry beriberi: neuritis, limb paralysis 	<ul style="list-style-type: none"> • Populations who consume non-parboiled polished rice as a staple are at risk, particularly where the rice is contaminated with moulds.
Niacin	Pellagra	<ul style="list-style-type: none"> • Diarrhoea, dementia and dermatosis (of exposed areas) 	<ul style="list-style-type: none"> • Maize-eating populations who do not treat the maize to release niacin. • Emergency affected populations whose ration does not include legumes, e.g. peanuts. • Women at higher risk than men; risk increases with age.
Vitamin C	Scurvy	<ul style="list-style-type: none"> • Infants: painful, swollen bones/joints • Others: bleeding, swollen gums (no pus), slow healing of wounds 	<ul style="list-style-type: none"> • Populations with no access to fruits, vegetables. • Emergency affected populations dependent on inadequate rations. • Women (especially if pregnant) at higher risk than men; risk increases with age.
Iron	Iron-deficiency anaemia	<ul style="list-style-type: none"> • Mild/moderate: no definite pallor • Severe: tiredness, pallor (palms, tongue), headache, breathlessness 	<ul style="list-style-type: none"> • Populations in areas where malaria and intestinal parasitic infestations are prevalent. • Women of child-bearing age. • Pregnant and breastfeeding women. • Babies exclusively breastfed beyond the age of 6 months. • Weaning-age children.

Iodine	Range of iodine deficiency disorders (IDDs)	<ul style="list-style-type: none"> • Goitre: swollen thyroid gland • Cretinism: mental defect • Deaf-mutism, squint 	<ul style="list-style-type: none"> • Populations in mountainous areas of Europe, Asia, America and Africa with limited access to sea foods. • Prevalence increases with age and peaks during adolescence. • Affects girls more than boys. • Affects women more than men because of increased thyroid activity during pregnancy.
---------------	----------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Management of Malnutrition and Micronutrient Deficiencies

In emergencies, prevention and treatment of malnutrition is necessary since it is associated with a high risk of illness, disability, and death.

Prevention of Malnutrition and Micronutrient Deficiencies

Ensuring that displaced people have adequate food and micronutrients can reduce the risk of acute malnutrition. This will improve their survival by increasing resistance to diseases and reducing disability. All displaced people should consume sufficient quantities of the following foods:

- a. an *appropriate staple food* — usually cereals (maize, wheat, rice, millet, or sorghum)
- b. a *protein-rich food* — usually legumes (lentils, beans, peas, etc.) or groundnuts
- c. a *rich source of energy* — for example, vegetable oil
- d. an *adequate intake of micronutrients* — usually found in fresh or fortified foods. Among the food aid commodities for displaced populations in Africa, only **blended foods** are fortified. The following foods are milled, cooked, and fortified together to make blended foods:
 - Cereal – maize, sorghum, millet, wheat or a combination, providing carbohydrate and protein
 - Pulses – chickpeas or soya beans as an additional source of protein
 - Oilseeds (groundnuts, dehulled sunflower seeds, sesame), soya beans or stabilised vegetable oil as an additional source of oil
 - Vitamin/mineral supplement (1 kg vitamin premix plus 3 kg mineral premix per metric ton of finished product)
 - Sugar if required, replaces an equivalent amount of cereal

Treatment of Malnutrition and Micronutrient Deficiencies

Severe malnutrition is easily reversible with appropriate health care and nutrition intake. The primary concerns when treating individuals with severe acute malnutrition are fluid and electrolyte imbalance, infections, hypoglycaemia, prevention of measles, hypothermia, and congestive heart failure. Initially, these individuals require precise quantities of specially prepared food (usually composed of dry skim milk, oil and sugar). Depending on their rate of recovery, their diet will be changed gradually until they can resume their normal diet. The following table summarises the management of severely malnourished children:

Table 6-4: Management of Severe Malnutrition

	THERAPEUTIC CARE
PHASE I About 1-7 days (24-hour care)	<ul style="list-style-type: none"> • Keep warm and treat or prevent hypoglycaemia by feeding every 2-3 hours • Treat or prevent dehydration with ReSoMal* • Correct electrolyte imbalance: Potassium supplements or bananas • Treat incipient or developed septic shock: broad spectrum antibiotics • Feed the child: Therapeutic Milk or High energy milk (nasogastric tube if necessary) • Treat infections: cotrimoxazole, ampicillin, gentamycin, chloramphenicol • Give measles vaccination • Treat micronutrient deficiencies: vitamin A, folic acid, fortified foods • Manage complications: severe anaemia, cardiac failure
PHASE II About 14 days (day care)	<ul style="list-style-type: none"> • Nutritional rehabilitation: Therapeutic Milk or High Energy Milk/Porridge, local meals, • Re-initiate or encourage breastfeeding • Emotional and physical stimulation • Preparation for discharge: counselling of caregivers, social support, replace with family diet, provide missed immunisations

Source: WHO, 1999

* Severely malnourished children require a special ORS solution that contains less sodium but more potassium than the amount found in standard ORS. Resomal may be prepared by diluting the standard WHO-recommended ORS in 2 liters of water instead of 1liter, and adding 50 g of sucrose and 40 ml of a mineral mix solution.

Treatment of micronutrient deficiencies is complicated because of difficulty in identifying them. Simple, rapid diagnostic tests are currently available only for xerophthalmia and goitre, which can easily be identified and corrected through population-level interventions (vitamin A supplements and salt iodisation). The following table summarises the recommended treatment protocols for micronutrient deficiencies:

Table 6-5: Treatment Protocols for Micronutrient Deficiency Disorders

DISORDER	TREATMENT
SCURVY	1 g ascorbic acid daily for 2-3 weeks
BERIBERI	<p><i>Acute beriberi:</i></p> <p>Infants: give 25-50 mg thiamine IV then 10 mg IM daily for 7 days then 3-5 mg orally daily for at least 6 weeks</p> <p>Adults: 30-100 mg thiamine IV then 10 mg/day orally for 7 days then 3-5 mg/day orally for at least 6 weeks.</p> <p><i>Moderate beriberi:</i></p> <p>Infants & adults: 10 mg/day orally for 1 week then 3-5 mg/day orally for at least 6 weeks</p>
PELLAGRA	300 mg nicotinamide daily in 3-4 divided doses for 3-4 weeks
XEROPHTHALMIA	<p>3 doses of 200,000 IU vitamin A orally on 1st day, 2nd day and 4 weeks later</p> <p>Use half the dose (100,000 IU) for infants 6-11 months and one-fourth the dose (50,000 IU) for infants below 6 months of age.</p> <p>Children/adults with severe malnutrition – full treatment as above</p> <p>Children with persistent diarrhoea and other infections – 200,000 IU orally once</p>
ANAEMIA*	<p>Children 0-23 months – give 3 mg iron /kg body weight daily</p> <p>Children 2-5 years – 2 mg iron /kg body weight daily (up to 30 mg/day)</p> <p>Children of school age and adolescents – 30 mg iron + 250 ug folate daily</p> <p>Women of child-bearing age – 60-120 mg iron + 400 ug folate daily</p> <p>Pregnant women – 60-120 mg iron + 400 ug folate daily</p>

	Other adults – 60 mg iron daily Note: <i>Treat all anaemic patients living in a malaria endemic zone with an effective anti-malaria cure</i>
IODINE DEFICIENCY	If iodised salt is not available: 400 mg iodine in iodised oil covers needs for 12 months and prevents births of cretins. Is especially important for children and pregnant and fertile women. For non-breast-feeding infants, 200 mg iodine.
RICKETS	25 ug calciferol daily for 6 months

***Iron therapy for severe anaemia:** Individuals may present with haemoglobin concentrations below 25 g/L (2.5 g %). Blood transfusion should be avoided because of the danger of circulatory overload and transmission of infectious diseases, including HIV/AIDS. However, if congestive heart failure or a need for emergency surgery arises, it is advisable to give a potent diuretic (such as intravenous furosemide), and transfuse blood as packed red cells, while performing a simultaneous venesection to prevent volume overload from occurring.³

PRINCIPLES OF FOOD AID AND NUTRITION

*Every man, woman and child has the inalienable right to be free from hunger
(Declaration from the First World Food Conference in Rome, 1974)*

It is important to understand the basic principles of food and nutritional interventions in emergencies when planning emergency nutrition programs.

1. Recognise and Build on How Refugees “Cope” and Spend their Time?

Principle 1: Long-term expectations (durable solutions, i.e., repatriation) greatly influence refugees’ behaviour and attitudes, and their approaches to food exchange and self-reliance. Refugees who believe that they are likely to repatriate soon (within less than 18 months) will not invest time in building roads, clearing land, irrigation channels, dikes, etc. They will not undertake to learn the local language, customs, and market data (what sells, where to sell it, etc.).

The following have been identified as coping mechanisms for refugees faced with food shortages:

- Search for wild foods and game
- Sending children away to be cared for by others
- Plucking fruits from trees in the area
- Travel to local markets
- Stealing from food stores

Observation: Relief programs are designed so as to maximise output and minimise costs incurred by international humanitarian organisations. They rarely take into account the tremendous resourcefulness and time costs on the recipient populations.

Principle 2: Place supplementary feeding sites at regular intervals in the middle of camps. This will reduce the transit time of women and older children who are responsible for bringing malnourished children for feeding. This increases compliance/attendance.

Refugee women face severe tradeoffs between the time they spend on childcare, complying with supplementary feeding programs, processing and cooking food, collecting and disinfecting (boiling) water,

and searching for food and fuel. If all observational surveys are taken as accurate, then women would spend more than 24 hours per day performing all these tasks.

2. Provide Culturally Appropriate Food

Principle: Foods that are not consumed have no nutritional value.

Emergencies are not a suitable time to introduce a new type of food. Yet a common problem with food aid is that the foods provided are not culturally acceptable. Disaster victims may be forced to accept unfamiliar food, which may not be consumed or can cause diarrhoea or other side effects. To achieve long-term nutritional recovery of affected populations, relief food for displaced populations should be:

- fit for human consumption
- nutritionally suitable
- culturally acceptable (particularly the cereal or staple)
- readily prepared and usable by the beneficiaries, using available facilities and fuel supplies

The following table lists the primary sources of food for typical refugee households:

Table 6-6: Primary Sources of Food for Refugee Households

a. Ration food aid (whole grains, oil, beans)
b. Selective feeding food aid
c. Market purchases (vegetables, meats, processed foods, biscuits, alcohol)
d. Growing crops: <ul style="list-style-type: none">• day labour, commercial farms (cash crops)• refugee plots – allocated or leased (staple and beans)• household garden plots at living compound (vegetables, sunflower seeds, leaves)
e. Inter-household sales
f. Sharing, or communal cooking
g. Special supplementary feeding programs (oil, milk, blended foods, dried milk, biscuits)
h. Gifts, feasts, cultural obligations
i. Stored food brought by displaced persons from country of origin (grains, livestock)
j. Raise poultry

Relief planners can identify the appropriate foods by consulting the “List of Major Foods Consumed in Selected Countries” report.⁴ Fresh foods, spices, tea, yeast, etc. should also be made available to the population where possible. They will provide an additional source of micronutrients and increase the palatability and acceptability of prepared foods. They also enable the beneficiaries to prepare meals in a more familiar manner.

3. Anticipate and Account for How Refugees Use Foods

Principle: The more desperate refugees are, the more they invest their time into finding transactions that give them the most income value for their assets. Therefore, a great deal can be learned from examining the self-reliance strategies of self-settled refugees who quickly become self-provisioning.

The following table summarises how food aid that is received by average households is typically used:

Table 6-7: How Food Aid Is Used

<ul style="list-style-type: none"> a. Consume in diet (all of sugar, 1/2 of grain, 2/3 of lentils, 1/3 vegetable oil). Children will consume more of lentils b. Exchange between households (milk, lentils/beans), partly to balance hot/cold attributes c. Barter for other foods (more sugar, tea, coffee, flour, pasta, bread, spices, fresh fruits) d. Men will eat more of meats e. Barter or sell to obtain other goods (shoes, shirts, antibiotics, painkillers) f. Barter or sell to afford other essentials (bus fare, school fees, medical fees, savings for return) g. Give as gifts (to wayfarers, non-registered refugees, celebrations) h. Pay as taxes (to community leaders, militia...) i. Feed to household animals (milk to pigs, chaff to chickens, lentils to goats...) j. Store for later (packaged, canned goods, particularly foods that are unfamiliar) k. Waste (foods that rot, flour, beans).

Observation: Nutritionists spend a significant amount of time calculating whether the required total food energy is 1850 or 2100 kcal per day (while adjusting for workload, temperature, etc.). They imagine that fine-tuning these requirements will correspond with actual consumption. However, the following table shows that the ideal ration in a camp rarely reflects the actual diet:

Table 6-8: Comparing the General Ration to Typical Consumption Practices

General Ration Provided		Typical Consumption	
• Maize	350 kcal/capita/day	• Maize	150 kcal/day
• Red Beans	60 kcal/cap/day	• Beans	10 kcal
• CSB	50 kcal/cap/day	• CSB	0
• Sugar	10 kcal/cap/day	• Sugar	20 grams
• Vegetable oil		• Vegetable Oil	0
		• Local meats/fish	5 grams
		• Breads, pasta	10 grams
		• Mango, papaya, etc.	20 grams
		• Cassava, millet...	50 grams
		• Leaves, vegetables	50 grams
		• Coffee/tea/soft drinks	a lot

4. Assess the Impact of Food Aid on the Market

Principle 1: All food programs have a “market” impact. Any food brought into a country has the effect of depressing local prices and reducing incentives to farmers to expand their crop. All efforts in local purchases have a corresponding incentive on local food production.

Often, the aid agencies are part of a “cycle of trade” with the refugees.

Principle 2: High-value foods reap higher returns when traded by the recipients while low-value foods are “self-targeting” to the poor and vulnerable. Choosing low-value foods means these foods are more likely to be eaten by those you are seeking to feed.

Emergency-affected recipients of aid will sell much of it. It is their main or only opportunity to exchange for other needs. The general order of food preferences from highest to lowest value is as follows:

- sugar
- vegetable oil
- rice
- wheat flour
- maize flour
- coarse grains

Principle 3: Markets always exist. If you have something valuable to trade, outside merchants will find you. If you have the means to buy food, merchants will bring goods to you.

Observation: Every refugee camp in the world has stores and stalls for selling food and other items established within the first week of existence. By the end of one or two years, many large camps have a thriving marketplace for trade, as any highly populated village. Because refugee camps are more densely populated than local towns or villages, the major trading centre for a whole region may be located inside a refugee camp. Efforts to prohibit markets in a refugee camp always fail to shut off trade, as markets merely go underground. This increases the transaction costs for the refugees and locals, and reduces the total income and diet for refugees.

Observation: Livestock are rarely consumed directly by refugees. Most valuable livestock belonging to refugees are sold to locals for higher prices.

5. Need for Uniform Standards in Food Aid

Although absolute standardisation of food aid may be neither possible nor appropriate, the following principles should be followed:⁵

- *Competition between agencies must be avoided — all organisations should provide similar general food rations to different communities in generally similar conditions.*
- *Provisions for refugees and displaced persons should not exceed what is available to the local population. If necessary, provisions should be made for the surrounding population.*
- *The same standards for food aid should be followed for refugees in similar situations in different countries.*

Observation: Food baskets (the collection of food items which make up the rations for a general food program) for displaced people in different regions may differ greatly, as shown in Table 6-9.

Table 6-9: Food Baskets for Various Regions of the World⁶

	EUROPE	ASIA	AFRICA
Food Basket	<ul style="list-style-type: none"> • Wheat flour • Beans • Oil • Pasta • Canned meat • Dried milk • Yeast • Salt • Tea/coffee • Dried fruits • Sugar 	<ul style="list-style-type: none"> • Rice • Lentil • Oil • Salt • Sugar • Blended food • Fresh vegetables 	<ul style="list-style-type: none"> • Maize grain • Beans • Oil • Salt • Sugar • Blended food
Quantity/g	838	650	575
Energy /kcal	3,129	2,049	1,878

Protein/g	115	48	60
Cost/ USD	0.75	0.18	0.12

6. Recognise the Prevalence of Sub-Clinical Nutritional Deficiencies

Principle: Uprooted people are always at heightened risk of developing micronutrient deficiencies due to their narrowed dietary variety. In camp situations, where the main source of food for long periods (sometimes 10 years) is the food aid (i.e., one type of staple, beans and vegetable oil), epidemics of micronutrient malnutrition are inevitable and easy to predict.

Disability and death may result from micronutrient deficiencies that emerge during treatment of or recovery from severe malnutrition. The minimum daily requirements of essential vitamins and minerals must be assured in the diet of populations fully dependent on food aid. Possible ways of ensuring an adequate supply of micronutrients for displaced populations include the following (in order of preference) ⁷:

- Promoting the production of vegetables and fruits
- Providing fresh food items
- Adding to the ration a food rich in a particular vitamin or mineral
- Providing fortified food (blended food)
- Distributing micronutrient supplements, e.g., vitamin A, vitamin C, iron, and folic acid with supplementary and therapeutic feeding and prenatal care

Note: *Selling of food aid by recipients often increases dietary diversity and nutrient consumption.*

7. Correct Common Misconceptions on Nutrition of Refugees⁸

Although inadequate organisation and resources limit the effectiveness of a nutrition program in emergencies, correcting the following misconceptions can safeguard the life, health, and well-being of displaced populations.

Table 6-10: Common Misconceptions on Nutrition of Refugees

MISCONCEPTION	CORRECTION
Starving people can eat anything.	<ul style="list-style-type: none"> • Starving people are often ill and may not have a good appetite. • Even if hungry, people do not often consume adequate quantities of unvaried and unfamiliar food for long periods. • People fail to thrive on a monotonous diet of three commodities (e.g., wheat, beans, and oil) from month to month.
Refugees can manage with less.	<ul style="list-style-type: none"> • Refugees have the same basic human rights to food, shelter, and care as non-refugee populations. • Refugees will often need more than normal food requirements if they were malnourished and sick before arriving at a camp or have inadequate protection against the elements.
A standard ration (2000 kcal) is suitable for all populations.	<p>Using a single figure (e.g., 2000 kcal/person/day) is likely to lead to either a deficit or waste. The daily caloric requirements for a refugee population will vary according to the following:*</p> <ul style="list-style-type: none"> • the demographic composition • the nutritional and health status of the population (allowing for “catch-up” growth where people are malnourished) • the level of activity • the environmental temperature • the likely waste along the food supply chain
Energy (kcal) adequacy means nutritional adequacy.	<ul style="list-style-type: none"> • The diet should be adequate in both quality and quantity, providing the required calories, proteins and micronutrients.

	<ul style="list-style-type: none"> • Often, a ration is designed to meet the minimum energy needs, while micronutrients are left to look after themselves. How micronutrient needs are to be met must be specified. • The ration must be designed to fully meet the nutritional requirements where refugees are completely dependent on the ration provided (e.g., during the acute emergency phase), or cannot trade to diversify their diet. • Foods should be diverse and palatable, and the special needs of weaning children must be met.
Trading foods indicates that people do not need all of the rations.	<ul style="list-style-type: none"> • If the food basket does not provide all the required nutrients, then trading may need to be encouraged to prevent undernutrition and micronutrient deficiencies among the refugees. • The fact that some foods may be traded to add variety to the diet is no justification for reducing the ration.
Children with diarrhoea should not be fed intensely.	<ul style="list-style-type: none"> • Any child with diarrhoea must be fed, with a nasogastric tube if necessary, while being rehydrated. Not feeding a severely malnourished child who has diarrhoea can be fatal. • Even if diarrhoea is profuse, some nutrients are absorbed and can start the recovery process.

* For a healthy population with a typical African demographic composition, under normal nutrition conditions and environmental temperature of 20° C, the average requirement is estimated as 1,950-2,210 kcals/person/day for light activity (1.55 BMR).

8. Recognise the Role of Women in Household Food Security

Typically, women are primarily responsible for preparing daily meals for the family. During emergencies, the burden of women increases as family units often break down and men may be absent. They are forced to adopt the most direct coping mechanisms to obtain food for the family. Some of these mechanisms may be at the cost of the family's health and livelihood.

Relief agencies should recognise the value of women as sources of information about the local food economy. They should also consider the impact of their projects on women, taking care not to increase their responsibilities or burdens. When planning food aid programs, every opportunity should be taken to empower women and other disadvantaged groups, both economically and socially.

OVERVIEW OF EMERGENCY NUTRITION PROGRAMS

Direct Food Aid

The key to successful food aid is to supply enough food resources for people to survive and recover with dignity. Direct food aid should be short term, ensuring that the general ration meets overall survival needs. Any food supplements should be in addition to, not a substitute for, the general ration, as described below:

General Rations

This is the distribution of food commodities in sufficient quantities to meet a family's basic nutritional requirements. The food basket and rations are designed to bridge the gap between the affected population's requirements and their own food sources. The same amount of ration is given to every family member, regardless of age or individual needs, while providing a buffer against shortages or spoilage. The general ration usually consists of basic foods (e.g., staples, pulses, oil, and sugar). *Complementary foods*

(such as fruits, vegetables, blended foods, spices, iodised salt, tea, and coffee) may be given to add nutrients, taste, and variety to basic foods and to enable people to make or improve their traditional meals.

There are many problems associated with the supply and distribution of the general ration. Many problems arise because of inadequate food supplies or nutrients. Adequate food supplies does not guarantee that it will be fairly distributed and consumed by each family and individual. Completing the registration of the affected population as soon as possible can minimise these problems.

Selective Feeding Programs

Two types of selective feeding programs are commonly set up during nutritional emergencies — *supplementary feeding* and *therapeutic feeding*. Each feeding program is described below:

1. Supplementary Feeding Programs (SFP)

Supplementary feeding is the distribution of additional foods to the general ration. This supplement covers the needs of individuals who are malnourished or at risk of being malnourished, such as:

- Children under 3 years whose family is short of food (using the height cut-off for 3 years as less than 90 cm).
- Moderately malnourished children under 5 years (using MUAC less than 13.5 cm or weighing less than 80% WFH).
- Any individuals who have been discharged from therapeutic feeding programs.
- Pregnant women of 4 months or more and nursing mothers till 6 months post-delivery.
- Any pregnant women or nursing mothers who look thin (using MUAC less than 22 cm as the cut-off indicator for pregnant women).
- Older children, adolescents, adults, elderly persons and medical referrals who are malnourished (based on WFH, BMI, MUAC or clinical signs).

Supplementary feeding may be carried out in two ways:

1. *Take Home* or *Dry Rations* — provide 1,000-1,200 kcal/person/day and 35-45 grams of protein for off-site preparation and consumption. How frequent these rations are distributed depends on the objectives of the program.
2. *On-Site Feeding* or *Wet Rations* — provide from 500-700 kcal/person/day and 15-25 grams of protein in the form of prepared meals for targeted individuals once or twice daily for on-site consumption.

The following table compares the advantages of dry and wet rations.

Table 6-11: Comparison of Dry Rations and Wet Rations

DRY RATIONS	WET RATIONS
<ul style="list-style-type: none"> • Less time to set up, fewer resources needed • Can serve larger numbers. • Particularly appropriate for dispersed populations who would have to travel long distances to attend daily. • Carries less risk of cross-infection since large numbers of malnourished and sick children do not have to be near each other while feeding. • Costs mothers less time to participate, leading to better coverage and lower default rates. • Keeps the responsibility for feeding the child within the family. 	<ul style="list-style-type: none"> • Ensures the target individual consumes the whole ration. • Feeding problems can be identified and dealt with effectively. • Allows provision of complementary health services on-site (e.g., immunisation, health education, micronutrient supplementation, deworming and growth monitoring). • Participants do not need a supply of fuel or cooking utensils. • Provides security if beneficiaries fear being robbed of weekly food supplies on the way home.

The benefit of supplementary feeding has been increasingly questioned. Although most field workers of supplementary feeding programs consider them valuable, they are not cost-effective. In addition, supplementary feeding may lead to the following consequences:

- If supplementary rations are given as incentives for improving attendance (e.g., prenatal care, school), there is the risk of attendance decreasing when supplies are interrupted.
- Availability of food for SFP may discourage health workers from investigating and dealing with other causes of malnutrition.
- Distributing supplementary rations may distract health workers from activities with a longer-term impact, such as nutrition education.

2. Therapeutic Feeding Programs (TFP)

Therapeutic feeding is an intensive, round-the-clock nutritional and medical treatment program that is only provided under the supervision of health workers. The following may be enrolled into a TFP:

- Children under 5 years (or less than 110 cm tall) who are severely malnourished (weight less than 70% WFH and/or nutritional oedema)
- Severely malnourished older children, adolescents, and adults (based on available WFH standards or presence of oedema)
- Low birth weight (LBW) babies
- Orphans younger than one year (when traditional care is unavailable or inadequate)
- Mothers of children less than 1 year with breastfeeding failure

Because many children enrolled in TFPs are in fragile condition—due to underlying infectious diseases such as measles, diarrhoea, and tuberculosis—they do not survive. More efforts should be directed toward preventing people from deteriorating to an extent where they require therapeutic feeding.

It is not necessary to set up selective feeding programs in response to every nutritional emergency. Relief planners need to understand the criteria for starting and closing selective feeding programs, which are summarised in the following table:

Table 6-12: Criteria for Setting Up and Closing Selective Feeding Programs

	WHEN TO START	WHEN TO CLOSE
SUPPLEMENTARY FEEDING PROGRAM	<ul style="list-style-type: none"> • At onset of an emergency, before food distribution systems are in place. • If there are problems in delivering or distributing the general ration. • If the prevalence of acute malnutrition is above 10% or expected to worsen. • In case of micronutrient deficiency, to provide micronutrient-rich food to target population. 	<ul style="list-style-type: none"> • Once general food distribution is adequate. • If prevalence of moderate malnutrition is stable at, or declining to, acceptable levels. • If there are no cases of scurvy, beriberi or pellagra. • Once disease control measures are effective. • No deterioration in nutritional status is expected.
THERAPEUTIC FEEDING PROGRAM	<ul style="list-style-type: none"> • When the number of severely malnourished individuals cannot be treated adequately in other facilities. <p>Note: Availability of trained health staff is a prerequisite for establishing TFPs.</p>	<ul style="list-style-type: none"> • When the number of patients in TFP is decreasing (e.g. less than 20). • If there is adequate medical and nutritional treatment in the clinic or hospital for all severely malnourished patients.

Source: UNHCR Guidelines

Note: UNHCR/WFP have developed the “UNHCR/WFP Guidelines for Selective Feeding Programs in Emergency Situations” to help design, implement, and monitor Selective Feeding Programs in emergency situations. See the Appendix for the basic principles for these guidelines.

Other Emergency Interventions

To sustain improvement in nutritional status, direct food aid must be combined with other public health measures, such as:

1. Promoting Breastfeeding and Safe Infant Feeding

In emergency situations, where hygiene is poor and risks of infection are increased, breastfeeding remains the healthiest way to feed infants. Breast milk is ideal because it contains antibodies that help prevent or reduce infant morbidity and mortality. WHO estimates that up to 1.5 million infant deaths world-wide could be prevented through improved breastfeeding practices.⁹ Even when clean water and fuel to sterilise feeding utensils are available, breast-milk substitutes are not recommended, because they do not provide antibodies that protect infants from infections. Thus, artificially fed infants have more than 20 times the chance of dying from diarrhoea and other infectious diseases than those who are exclusively breastfed.¹⁰ In emergencies, safe and adequate nutrition for infants can be achieved in the following two ways:

- a. *Promoting and Supporting Breast-Feeding* – Table 6-13 describes how breast-feeding among displaced populations can be promoted and supported:

Table 6-13: Ways to Promote and Support Breast-Feeding Among Displaced Populations

- Educate the community on the superiority of breast milk over other infant foods.
- Encourage all mothers to start breastfeeding within one hour of birth and thereafter feeding on demand (including night feedings).
- Encourage mothers to exclusively breastfeed their children until the age of six months, and thereafter to sustain breastfeeding at least till the age of two years while introducing appropriate complementary foods.
- Encourage mothers to increase the frequency of breastfeeding during and after illness.
- Provide extra rations for breastfeeding mothers (including sick and malnourished mothers) to build their body stores of nutrients and to help conserve their strength.
- Some women are willing to breastfeed babies of other women who died or are unable to produce milk. Encourage women to do this, give them extra rations.
- Encourage mothers known to have HIV infection to breastfeed their babies, where the risk of death from infectious diseases and malnutrition is high.

Note: Re-stimulation of lactation is possible for mothers who have ceased breast-feeding.

- b. *By Restricting the Donation and Use of Breast Milk Substitutes* — Infants whose mothers cannot produce enough breast milk, orphans, and unaccompanied minors younger than one year are at increased risk of becoming malnourished. Unless a wet nurse can be found, breast milk substitutes are the only option. However, these substitutes should only be provided if the milk can be prepared safely and sufficient supplies can be guaranteed.

Note: Even in the worst famine, do not introduce other foods or liquids to infants for at least 6 months. For no crisis is it advisable to hand out breast milk substitutes to the general population.

2. Nutrition Education

Information, education, and communication (IEC) of nutritional information is one of the most efficient interventions, particularly when it targets women. The aim of nutrition IEC is to change existing behaviour and reinforce positive food practices among mothers, families, and the community. Nutrition education

may be delivered at health units, feeding centres, schools, or within the community, in various ways, such as group talks, role-plays, individual or family counselling, posters, and food demonstrations. It should raise public awareness in the following areas:

- The planned food aid interventions and the reasons for implementing them.
- How to improve the family diet using available resources (general rations, kitchen gardens).
- The causes of malnutrition (including non-food causes, such as frequent infections, closely-spaced births).
- The special food needs of sick or vulnerable individuals (young children, pregnant and nursing mothers, and the elderly)
- The value of nutrition-related health activities (e.g., prenatal supplements, breastfeeding, growth monitoring)
- The need for family planning/child spacing (particularly where prolonged food shortages are expected)
- Available sources of information on food and nutrition (at schools, health clinics, feeding centres)

3. Disease Control Measures

Disease prevention is a key component of nutrition programs. This requires collaboration with other sectors. Strengthening the following disease control measures will ensure a greater improvement in overall food security and nutritional status of a displaced population:

- Providing vitamin A to all young children
- Promoting measles immunisation
- Improving water supply, hygiene, and the environment
- Ensuring availability of ORS for anyone suffering from diarrhoea
- Controlling mosquitoes
- Deworming all children periodically
- Promptly identifying and treating anyone who is acutely sick
- Preventing the spread of HIV/AIDS
- Carrying out disease surveillance

NUTRITIONAL ASSESSMENT AND SURVEILLANCE

Improving the nutritional status of displaced populations has been slow despite decades of nutrition interventions. Better assessment and surveillance in emergencies may improve decision-making and ensure that nutritional interventions are more effective.

Nutritional Assessments

There are various ways of conducting nutritional assessments:

- **Anthropometric assessments** for nutritional status of individuals or a population
- **Clinical assessment** of nutritional status (wasting, micronutrient deficiency disorders)
- **Assessment of food security** at the household and community level

Anthropometric Assessments

Anthropometry is the measurement of human growth and body size to obtain information about an individual's health status in terms of his intake of nutrients and past illness. The aim of carrying out anthropometric assessments may include:

- To assess the prevalence of malnutrition in a community or population (initial assessment).
- To monitor trends and changes in the nutritional status of a community or population (follow-up surveillance).
- To monitor the nutritional status of individuals attending a nutrition rehabilitation program.

Various **anthropometric measurements** may be used to assess the type and degrees of growth failure, e.g., *height* (or *length* for children less than 2 years), *weight*, *age*, and *mid-upper arm circumference*.

Anthropometric measurements are usually carried out in children less than 5 years because their growth responds more rapidly to the effects of food shortages, disease outbreaks, or inadequate health care. Even though anthropometric measurements can be done in adults, they are more difficult because:

- They may involve carrying less portable equipment.
- Not all the adults may be at home during the time of the interview (particularly males).
- Decision-makers may not consider adult undernutrition a priority.

Because comparing different anthropometric measurements is meaningless, each individual's measure is compared to similar measures of a reference healthy (or normal) population to obtain **anthropometric indicators**.¹¹ This allows comparison between different populations.

The following are examples of anthropometric indicators:

- Height for age* (HFA) — expresses the height of a child in relation to the standard height for a normal child of his age. It is useful for measuring stunting (chronic malnutrition).
- Weight for age* (WFA) — expresses the weight of a child in relation to the standard weight for a normal child of his age. It helps determine if an individual is underweight, but does not explain why.
- Weight for Height* (WFH) — expresses a child's weight in relation to the standard weight for a normal child of his height. It is useful for measuring wasting. This chapter uses weight-for-height and weight-for-length interchangeably for children younger than 24 months of age, less than 85 cm tall, or too ill to stand.
- Mid-Upper Arm Circumferences* (MUAC) — defines wasting in terms of fat and muscle mass in the mid-upper arm. It is stable (about 14 cm) for healthy children aged between 1-5 years.
- Birth Weight* — any weight below 2500 g is considered as low birth weight. Although a good indicator for social development of the population or the nutritional status of the mother before delivery, it is not useful for populations that prefer delivering outside health facilities.
- Body Mass Index* (BMI) — a measure of thinness or energy deficiency in adults (expressed as weight/height²). The normal lower limit of BMI for adult men and women is 18.5. It is useful for measuring acute or short-term adult malnutrition. BMI is also a useful indicator of the welfare of populations.

In emergencies, Weight for Height (WFH), Weight for Age (WFA), and the Mid-Upper-Arm Circumference (MUAC) of children between the ages of 6-59 months are commonly used for nutrition assessments. (Height cut-offs of 65-110 cm are used when the ages of children cannot be determined). The advantages and disadvantages of using these indicators are summarised in the following table:

Table 6-14: Advantages and Disadvantages of Commonly Used Anthropometric Indicators

INDICATOR	ADVANTAGES	DISADVANTAGES
WFH	<ul style="list-style-type: none"> • Best index for acute malnutrition (wasting) • Permits useful comparisons, based on reference populations • Useful where assessment of correct age is not possible • Permits monitoring of individual growth 	<ul style="list-style-type: none"> • More time-consuming to measure • Requires training and certain experience
WFA	<ul style="list-style-type: none"> • Most widely used in health centres because of simplicity and availability of scales 	<ul style="list-style-type: none"> • Does not clearly distinguish between wasting and stunting • Not possible when the age is not known
MUAC	<ul style="list-style-type: none"> • Easier and quicker to measure than WFH • Low cost – requires a strip of tape and little training • More practical where interviewers have to walk long distances • Useful for screening large numbers of children, as well as adults* • No need for reference data** 	<ul style="list-style-type: none"> • Needs supervision to ensure accurate measurement • Less sensitive to individual weight change than W/H • Preferentially identifies younger children as malnourished • Variable cut-offs used to classify malnutrition • Tends to work better for younger ages

* Appropriate cut-offs need to be defined for adults. For pregnant women MUAC less than 23.0 cm indicates moderate risk of growth failure in the foetus, less than 20.7 cm indicates severe risk.

** Reference data for MUAC is now available, including: MUAC-for-Age (for boys and girls aged 6-59 months, WHO); MUAC-for-Height (QUAC stick for adjusting AC measurements for height, ICRC); MUAC-for-Height (reference values, CDC)

Note: *Weight-for-Height, Weight-for-Age, and Height-for-Age can be expressed in two ways:*

- *Percent of median* e.g. % WFH = $\frac{\text{Actual weight}}{\text{Median weight of reference children}} \times 100$
- *SD-score or Z-score* e.g. WFH = $\frac{(\text{Actual weight} - \text{Reference weight})}{\text{Standard deviation of reference population}}$

Malnutrition may be defined in terms of different anthropometric indicators, such as the following:

- Median WFH less than 80% indicates wasting
- Median HFA less than 90% indicates stunting
- Median WFA less than 80% median indicates underweight
- MUAC less than 12.5% indicates wasting
- BMI less than 17 indicates wasting in adults
- Malnutrition rate is the proportion of children aged 6 months to 5 years who are below –2 Z-scores or the median 80% of the reference value.

Note: *Refer to the Appendix for a summary of anthropometric cut-off levels for different age groups.*

Clinical Assessments

Anthropometric measurements do not reveal all the signs of nutritional deficiencies that affect mortality or productivity. Clinical assessments are needed to identify the following:

- Presence of nutritional oedema* — kwashiorkor (sign of severe malnutrition)
- Signs of vitamin deficiencies* — e.g. night blindness and damaged eyes (vitamin A); diarrhoea and skin rash on exposed body parts (vitamin B1); bleeding gums or swollen painful joints (vitamin C)
- Signs of mineral deficiencies* — e.g., anaemia (iron), goitre (iodine)

- d. *Signs of infectious diseases* — observed anthropometric values must be weighed against past illness, such as a child with moderate malnutrition who is suffering from dehydration or pneumonia should receive the care for severe malnutrition.

The prevalence of mineral deficiencies in a population may be assessed in various ways:

- Measuring the level of haemoglobin in a finger prick blood sample. This is only practical for individuals, not at the community level.
- Carrying out surveys on the household food consumption over the last 24 hours.
- Collecting salt from different households and testing it for iodine content, etc.

Food Security Assessments

Assessing the causes of food insecurity and how people cope with the changes in food security can help planners determine the most appropriate interventions. The following indicators may be monitored:

- *Food Security indicators* — markets, food production, livestock, household assets, employment, food gathering, sufficiency of food and fuel, food preparation and consumption, breastfeeding, endemic micronutrient deficiencies, etc.
- *Public Health indicators* — disease patterns, access to health services and feeding centres, nutrition education, environmental risk factors, hygiene measures, traditional medicinal practices, etc.
- *Social and Care Environment indicators* — especially with respect to vulnerable populations (such as minority or separated groups, pregnant women, breastfeeding mothers), infant and young child feeding practices, shelter and overcrowding, and social support systems.

Nutritional Surveillance

Reducing mortality requires monitoring the evolving nutritional emergency, as well as the relief response. Most nutritional surveillance has been limited to nutrition surveys and growth monitoring. These assume that lack of food is the primary cause of malnutrition. Less attention has been given to indicators of health, access to food, and care. This is because most surveillance systems are not based on the conceptual framework of the causes of malnutrition, which considers the larger aspects of the problem. In addition, decisions to increase food aid are usually based on political factors or past practices rather than on nutritional surveillance information.

Any surveillance system that is set up should be able to detect existing food security and nutrition problems, identify the causes and possible solutions, and communicate this information in a way that can help decision-makers take appropriate actions. Figure 6-4 below shows how a surveillance system can help identify the underlying causes of a disaster situation:

Figure 6-4: Using a Surveillance System to Identify Causes of Disaster

In May/June 1994, several hundred thousand Rwandans crossed into Tanzania, settling into three large camps around Benako, and a dozen smaller camps further north in the Kigoma area. Because EPI was so good in Rwanda, there was very little excess mortality from vaccine-preventable diseases.

In mid-July 1994, approximately 700,000 Rwandans crossed into North Kivu, around the town of Goma. 80,000 people died in the next few weeks. Excess mortality of 80,000.

Why did they die? Because of cholera shigella plus unknown mediating factors.

Why did they die? Because of transit, fatigue, worry, and malnutrition.

Why did they die? Because NGOs were unable to provide rehydration.

Why did they die? Because NGOs were not well organised and many of the staff did not know how to organise ORS Programs.

A nutrition information system should be set up to operate at the household, community, program, and district level. The following objectives may be defined for various levels of nutritional surveillance:

- To monitor the nutritional status of individuals undergoing nutritional rehabilitation
- To monitor the nutritional status of a community or population
- To improve decisions about targeting of nutrition-related services
- To improve decisions on the use of existing resources for nutrition improvement
- To improve availability and access to resources for nutrition improvement

The key functions of various nutritional surveillance systems are summarised in the following table:

Table 6-15: Examples of Nutritional Surveillance Systems

SYSTEM	KEY FUNCTIONS
1. Surveillance of individuals (Growth monitoring)	<ul style="list-style-type: none"> • Weigh each child under five years monthly. • Plot each child's weight on a chart and connect points and compare the rate of weight gain to weight gain of healthy children. • Investigate the possible causes of growth failure through discussions with the mother.* • Provide appropriate nutrition intervention when necessary.
2. Community surveillance	<ul style="list-style-type: none"> • Conduct nutritional surveys to estimate the number of malnourished. • Compare results with those of other surveys and discuss findings with the health committees. • Review morbidity data on malnutrition from hospitals, health centres and the community. • Initiate community-level and household-level interventions.
3. Surveillance for program management	<ul style="list-style-type: none"> • Monitor the number of children attending monthly weighing sessions. • Monitor food distribution, including number of calories per person per day (food basket surveys). • Monitor the number of admissions and the progress of patients (cured, dropouts, deaths) in therapeutic feeding programs. • Investigate the reasons for declining attendance. • Develop a plan with community leadership for improving attendance.
4. Surveillance of policy and planning	<ul style="list-style-type: none"> • Identify vulnerable groups with a high prevalence of malnutrition. • Determine reasons for high prevalence among these groups. • Recommend targeting of public health or other development programs toward the most vulnerable.
5. Surveillance for timely warning	<ul style="list-style-type: none"> • Review agro-meteorological reports biweekly. • Collect information from existing famine early warning systems. • Compare findings with historical values and agreed cut-off points. • Recommend immediate and long-term relief interventions that can prevent a crisis.

* Growth failure may be defined as a loss of 1 kg or more in 1 month, or any weight of 2 kg or more below 80% of the median or no weight gain for at least 2 months.

Analysing Nutritional Data

It is not enough to carry out nutritional assessments and surveillance. The information must be analysed and presented to decision-makers in a manner they can understand. Any actions recommended from the analysis should be based on the following:

- The type and extent of malnutrition
- The relative importance of the underlying causes of malnutrition
- The perceptions and priorities of the affected population, including coping strategies
- The available resources, including technical, financial and infrastructure
- The practical constraints, including access to resources and the time-frame for response.

The following table summarises benchmarks for nutritional data that can guide decision-making on nutritional interventions:

Table 6-16: Benchmarks for Nutritional Data

FINDING	INTERPRETATION	ACTION REQUIRED
Malnutrition rate greater than or equal to 15% OR 10-14% with aggravating factors*	Serious situation	<ul style="list-style-type: none"> • General ration • Supplementary feeding for at-risk groups • Therapeutic feeding for severely malnourished individuals
Malnutrition rate 10-14% OR 5-9% with aggravating factors*	Risky situation	<ul style="list-style-type: none"> • No general rations • Supplementary feeding to malnourished individuals among at-risk groups • Therapeutic feeding for severely malnourished individuals
Malnutrition rate under 10% with no aggravating factors OR 5-9% with aggravating factors*	Acceptable situation	<ul style="list-style-type: none"> • No need for population level interventions • Attend to malnourished individuals through regular community services
Household food availability less than 2100 kcal	Unsatisfactory situation	<ul style="list-style-type: none"> • Improve general rations until local food availability and access becomes adequate

Source: WHO – Rapid Health Assessment, 1999

* Aggravating factors include:

- General food ration below the location-specific mean energy requirement
- Crude death rate greater than 1/10,000/day
- Epidemic of measles or whooping cough (pertussis)
- High prevalence of respiratory or diarrhoeal diseases

PLANNING EMERGENCY FOOD AND NUTRITION PROGRAMS

An effective response to nutritional emergencies involves more than simply providing food aid. Since multiple factors contribute to malnutrition, planning of food and nutrition programs must involve people from different relief sectors (e.g., the public health nurse, nutritionist, water and sanitation engineer, and logistician), local authorities, and the affected population. It should begin with a rapid assessment. All identified problems should be prioritised in order to find the most appropriate solution. Planning of the nutrition program should be based on clear goals and objectives in order to allow for monitoring and evaluation.

Assessment

A rapid nutritional assessment may be organised and carried out in 4 to 7 days. Objectives of the assessment may include the following:

- To confirm that a nutritional emergency or the risk of a nutritional emergency exists.

- To assess the severity and geographical extent of the nutritional emergency.
- To identify the main causes of the nutritional emergency.
- To assess the possible evolution and impact of the emergency on health and nutritional status.
- To determine who is most affected or vulnerable (which age, social or ethnic group).
- To identify measures that can minimise or prevent the nutritional emergency.
- To assess the local response capacity and needs.
- To establish or expand nutritional surveillance.

Several methods can be used to collect data, including direct observations, quick surveys, and interviews. Possible sources of information include the affected community (including women), the health workers, the local authorities, any famine early warning system, and sometimes the media. The following table summarises some of the information that may be gathered during the assessment:

Table 6-17: Checklist for Nutrition Assessment

<p>Indications of an ongoing nutritional emergency:</p> <ul style="list-style-type: none"> • Problems with access to food • Deteriorating nutritional status • Obviously elevated mortality <p>Indications of nutritional risk:</p> <ul style="list-style-type: none"> • Rumours of famine and malnutrition • Drought or flooding • Major pests affecting crops or livestock • Reports of excessive sale of household assets • Shift to eating crisis food • Declining food stocks at household/district/ national level • Rising market prices • Disruptive conflicts • Large population displacements <p>Identify main causes of nutritional emergency:</p> <ul style="list-style-type: none"> • Types and quantities of food available at the household, community, district (& national) level • Availability of staple foods and changes in price • Current and expected availability of food • Purchasing power (income, employment, sale of assets) • Availability and cost of other essential commodities (e.g., water, fuel) • Access to land • Availability of seeds and fertiliser • Recent migrations (inwards, outwards) • Food distribution (frequency, type, energy content) • Inaccessible areas, logistic problems 	<p>Assess the severity, geographical extent, and groups at risk:</p> <ul style="list-style-type: none"> • Occurrence of epidemics and endemic diseases • Coverage of health services, environment, water, sanitation and food safety programs • Patterns of settlement, displacement, shelter and clothing • Change in work patterns and sources of household food supplies • Signs of family disruption, violence, abandoned children and elderly, interruption of breastfeeding, decreased school attendance <p>Assess the population's health and nutritional status:</p> <ul style="list-style-type: none"> • Presence of kwashiorkor and/or marasmus, micronutrient deficiencies among children • Presence of adult malnutrition • Assess child morbidity and mortality <p>Identify measures to minimise/prevent emergency:</p> <ul style="list-style-type: none"> • Need for direct food interventions • Need for indirect food interventions • Need for technical support (e.g., nutritionist) • Other public health responses (e.g. immunisation) <p>Assess the local response capacity:</p> <ul style="list-style-type: none"> • General response – coping mechanisms, priority nutrition interventions and constraints • Technical capacity – for setting up food and nutrition programs • Availability of food stocks – central, district level • Logistics and managerial capacity – roads, warehouses, security, registration, communication • Public health response capacity – shelter, water
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	supply and sanitation, immunisation services
--	----------------------------------------------

Source: WHO – Rapid Health Assessment, 1999

After the assessment, key findings should be analysed and presented to all concerned. This will ensure co-ordinated assistance. Assessment findings can also be used as baseline data for monitoring the future response. If necessary, more thorough population-based surveys may be carried out later.

Identify Problems and Priorities

It is not enough to identify and treat all the individuals that are identified as malnourished. After the rapid assessment, a food security and nutrition survey (which requires two to three weeks to organise) may be carried out to define the causes of malnutrition and guide intervention strategies. The following causes of malnutrition may be identified:

- Basic causes of malnutrition
 - family unable to earn any form of income
 - children lack access to supplementary feeding
- Underlying causes of malnutrition
 - not enough food available to households
 - inadequate public health measures
 - mothers lack understanding of the nutrition needs of children
- Outcomes of nutritional stress
 - high prevalence of moderate to severe malnutrition
 - excessive loss of calories due to diarrhoea and other infections
 - micronutrient deficiency disorders

All identified problems should be reviewed and prioritised. Particular attention should be given to micronutrient deficiencies that may have existed prior to the emergency situation. Planners may use various criteria to rank different options for correcting micronutrient deficiencies, such as:

- Improving the nutritional quality of food rations by adding one or more micronutrients to staples (fortification)
- Providing special food stuffs that are rich in micronutrients as a supplement to rations
- Promoting nutrition education and kitchen gardens to improve the quality of family diets
- Distributing micronutrient supplements to target groups, e.g., vitamin A, iron and folate.

In the table below, adding micronutrients to staples and promoting nutrition education/kitchen gardens are ranked as the most suitable options for correcting micronutrient deficiencies existing in the displaced population.

Table 6-18: Ranking Different Options for Correcting Micronutrient Deficiencies

	Add nutrients to staples	Supplementary feeding with specialty foods	Nutrition education and kitchen gardens	Distribute capsules of micronutrients
COVERAGE (1 = poor, 4 = good)	4	1	2	3
RELIABILITY (1 = uncertain, 4 = high)	4	2	1	1

COST (1 = high, 4 = low)	2	1	4	4
LONG-TERM BENEFITS (1 = low, 4 = high)	3	2	4	1
RISK OF OVERDOSE (1 = high, 4 = low)	3	3	4	2
NEED FOR SUPERVISION (1 = significant, 4 = low)	4	1	3	2
VALUE IN UNSTABLE SETTINGS (1 = low, 4 = high)	4	3	2	1
TOTAL	24	13	20	14

Adapted from Steve Hansch¹²

Define Strategies for Promoting Access to Food

Strategies for food aid will depend on the nature or phase of the emergency, the physical condition of the general population, and the needs of vulnerable groups, as follows:

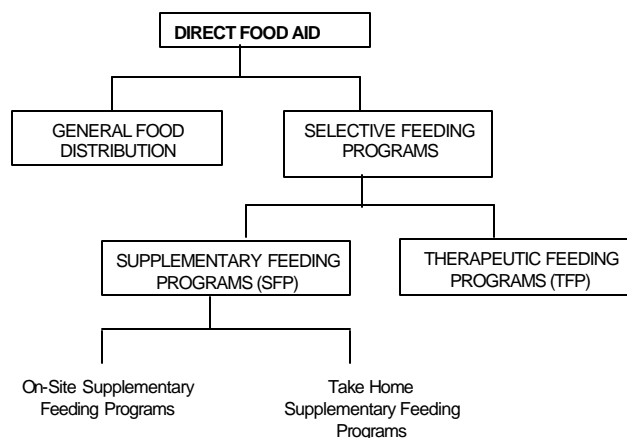
- During the early phase of a food emergency, families may need help to increase their economic security. Populations experiencing a later stage of a food emergency require both economic assistance and direct forms of food aid for the most needy. Implementing counter-famine measures early will ensure access to food and maintain the nutritional status of affected people.
- Victims of nutritional emergencies require life-saving measures that address the immediate and some underlying causes of malnutrition. Combining direct feeding programs with public health measures (e.g., oral rehydration therapy (ORT), vitamin A supplementation, immunisation) will improve nutritional status and increase disease resistance. Economic assistance at this stage is not a priority.
- As affected populations recover from nutritional emergencies, more productive forms of assistance should be provided such as employment, income generation, and market interventions. This will depend on many factors, e.g., the health status of the target population, their ability to grow food or engage in other income generating activities, the security situation, and host government policies.

Note: *This chapter will focus on strategies for addressing nutritional emergencies. For details on counter-famine strategies, refer to the suggested readings listed at the end of the chapter.*

Strategies for Acute Emergency Phase

During the acute phase, direct food aid strategies for correcting malnutrition should address the immediate, basic and underlying causes in ways that foster the recovery of the affected population.

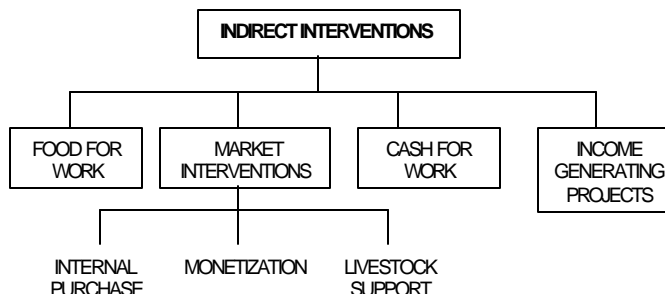
Figure 6-5: Feeding Program Strategy (Adapted from UNHCR/WFP: Guidelines for Selective Feeding, 1999)



Strategies for the Post-Emergency Phase

The following Figure shows strategies that may be used after the emergency phase to phase out direct food aid and promote self-reliance.

Figure 6-6: Strategies for the Post-Emergency Phase



Set Program Goals and Objectives

Defining the goals and objectives of the program will help identify the necessary inputs, activities, and outputs. In addition, they are needed for evaluating the outcome of food and nutrition programs. The goal of most humanitarian programs is to reduce or prevent excess mortality. Closely associated with this goal is eliminating excess disability. Objectives for specific interventions may have short or long-term benefits. The following table gives examples of objectives for different programs:

Table 6-19: Examples of Objectives for a Food and Nutrition Program

PROGRAM	OBJECTIVES
General Ration	<ul style="list-style-type: none"> To restore as soon as possible people's ability to obtain and produce food. To provide an income transfer with which people can recover their health, welfare and a reasonable existence.
Supplementary Feeding Program (SFP)	<ul style="list-style-type: none"> To reduce the prevalence of acute malnutrition in children under 5 years. To increase the attendance of pregnant and nursing mothers in health clinics. To provide follow-up for those discharged from Therapeutic Feeding Programs.

Therapeutic Feeding Program (TFP)	<ul style="list-style-type: none"> • To rehabilitate individuals who are severely malnourished. • To reduce the risk of excess mortality and morbidity in children under 5 years.
Food Fortification	<ul style="list-style-type: none"> • To enhance the quality of food available to displaced populations. • To reduce the level of morbidity and disability in a target population.
Nutrition Education	<ul style="list-style-type: none"> • To improve the use of general ration by displaced families. • To increase awareness about the food and non-food causes of malnutrition.
Food for Work	<ul style="list-style-type: none"> • To prevent or relieve hunger among vulnerable families. • To improve food security by developing the land and infrastructure.
Market Interventions	<ul style="list-style-type: none"> • To revitalise local food markets. • To improve access to foods for affected populations.
Income Generating Projects	<ul style="list-style-type: none"> • To provide alternative sources of income for most affected families. • To increase the ability of families to obtain or produce food.
Seeds and Tools Distribution	<ul style="list-style-type: none"> • To increase the amount of grain harvested. • To build the capacity and increase self-sufficiency of displaced families.

Identify Resources for Emergency Nutrition Programs

This section defines the steps for identifying resources for direct food aid. The same approach may be used to identify resources for other food and nutrition interventions.

1. Resources for the General Ration

a. Determine the Nutritional Requirements

In the first stages of an emergency situation, when no other information is available and only the number of affected people is known, an estimated energy requirement of 2,100 kilocalories (kcal) should be used for the immediate provision of food.¹³ Once population-specific information is available, this figure may be adjusted. The following table summarises the recommended nutritional requirements for the initial emergency phase:

Table 6-20: Nutritional Requirements for the Initial Phase

NUTRIENT	MEAN REQUIREMENTS/PERSON/DAY
Energy	2,100 kilocalories (kcal)
Protein	10-12% of total energy (52-63 g), but < 15%
Fat	17% of total energy (40 g)
Vitamin A	1666 IU (or 0.5 mg RE)
Thiamine (B1)	0.9 mg (or 0.4 mg/1000 kcal intake)
Riboflavin (B2)	1.4 mg (or 0.6 mg/1000 kcal intake)
Niacin (B3)	12.0 mg (or 6.6mg/1000 kcal intake)
Vitamin C	28.0 mg
Vitamin D	3.2-3.8 ug calciferol
Iron	22 mg (low bioavailability 5-9%)
Iodine	150 ug

Adapted from WHO 1997 Draft, WFP/UNHCR 1997

b. Select the Food Basket for General Distribution

It is important to consider the objectives of general distribution when selecting the food basket. The energy and nutrient content of the food basket is important where the objective is to improve

the nutritional status. If possible, the food basket should consist of locally available and culturally acceptable foods. The following table shows examples of food rations that may be appropriate.

Table 6-21: Food Basket for General Rations

ITEMS	RATIONS (Quantity in g/person/day)				
	RATION 1*	RATION 2*	RATION 3*	RATION 4**	RATION 5*
Cereal flour/rice/bulgur	400	420	350	420	450
Pulses	60	50	100	60	50
Oil (vitamin A fortified)	25	25	25	30	25
Canned fish/meat	-	20	-	30	-
Fortified blended foods	50	40	50	-	-
Sugar	15	-	20	20	20
Iodised salt	5	5	5	5	5
Fresh vegetables/fruits	-	-	-	-	100
Spices	-	-	-	-	5
Energy: kilocalories	2113	2106	2087	2092	2116
Protein/g (% kcal)	58g (11%)	60g (11%)	72g (14%)	45g (9%)	51g (10%)
Fat/g (% kcal)	43g (18%)	47g (20%)	43g (18%)	38g (16%)	41g (17%)

Source: WFP/UNHCR Guidelines, 1997

* The cereal used for calculation of this ration is maize meal.

** This ration has rice as a cereal.

Note: Adequate fuel and cooking utensils should be given with the selected food basket, and mill and grinding facilities made available, where necessary.

Populations that are fully dependent on food aid for more than three months should also receive complementary foods to prevent micronutrient deficiencies that are most likely to occur (due to lack of vitamins A and C, iron, and folate). Long-term measures for enhancing the nutritional value should be encouraged (e.g., barter, germination, kitchen gardens.).

c. Estimate the Population's Total Food Needs

The table below can be used to determine the overall metric tons of food needed for a specific population size for a fixed number of days.

Table 6-22: Food Needs for Displaced Persons

FOOD NEEDS FOR DISPLACED PERSONS Food in MT (1 MT = 1,000 kg), based on 500 g/person/day							
Population Size	1 day	20 days	60 days	90 days	120 days	180 days	365 days
250	.13	3.8	7	11.3	15	22.5	45.6
500	.25	7.5	15	22.5	30	45	91.25
1,000	.5	15	75	45	60	90	182.5
5,000	2.5	75	150	225	300	450	912.5
10,000	5	150	300	450	600	900	1,825
20,000	10	300	600	900	1,200	1,800	3,650
50,000	25	750	1,500	2,250	3,000	4,500	9,125
100,000	50	1,500	3,000	4,500	6,000	9,000	18,250
500,000	250	7,500	15,000	22,500	30,000	45,000	91,250
1,000,000	500	15,000	30,000	45,000	60,000	90,000	182,500

Source: USAID-OFDA DART Field Operation Guide

Note: A general rule for estimating the amount of storage space is 2 m³/MT of commodity, especially whole grain. Storage space for flour and oil will vary.

2. Resources for Selective Feeding Programs

a. Estimate the Target Population

Where information about the prevalence of malnutrition is lacking, it can be assumed that 15-20% of children less than 5 years will be moderately malnourished and 2-3% may be severely malnourished during the acute emergency phase. These figures can be used to estimate the target population (as shown in the example below), as well as the requirements for the food commodities and facilities.

Example:

- Estimated number of displaced people within and outside settlement = 30,000
- Estimated number of children aged less than five years (15-20%) = 4,500-6,000
- Estimated number of moderately malnourished children (15%) = 675-900
- Estimated number of severely malnourished children (2%) = 90-120

b. Select Food Commodities for Selective Feeding Programs (SFPs)

Food for SFPs should be rich in energy (supply at least 100 kcal per 100 grams, with at least 30% of energy from fat) and nutrients (including micronutrients). In addition, it must be locally available, culturally appropriate, easily digestible, and palatable. The following table shows examples of typical rations for SFPs.

Table 6-23: Examples of Typical Rations

Item	Take-Home or Dry Ration		On-Site Feeding or Wet Ration (g/person/day)				
	RATION 1	RATION 2	RATION 3	RATION 4	RATION 5	RATION 6	RATION 7
Blended food, fortified	250	200	100	-	-	125	100
Cereal	-	-	-	-	125	-	-
High Energy Biscuits	-	-	-	125	-	-	-
Oil, fortified with vitamin A	25	20	15	-	20	10	10
Pulses	-	-	30	-	30	-	-
Sugar	20	15	-	-	-	10	10
Salt, iodised	-	-	5	-	-	-	-
Energy (kcal)	1250	1000	620	560	700	605	510
Protein (g)	45	36	25	15	20	23	18
Fat % (kcal)	30	30	30	30	28	26	29

Source: UNHCR/WFP Guidelines, 1999

c. Select Food Commodities for Therapeutic Feeding Programs (TFPs)

Diets for therapeutic feeding are based on milk or blended foods. The following table describes the basic ingredients of therapeutic feeds that may be used for the first and second phase of treatment:

Table 6-24: Composition of Therapeutic Feeds

	Therapeutic Feeds	Basic Ingredients
Phase I 80-100 kcal/kg/day	Therapeutic milk F-75*	Dried whole or skim milk, sugar, cereal flour, oil, water, mineral mix, vitamin mix
	High energy milk feed	DSM, sugar, oil, water
Phase II 150-220 kcal /kg/day	Therapeutic milk F-100**	Dried whole or skim milk, sugar, oil, water, mineral mix and vitamin mix
	High energy porridge	Corn soy milk, sugar, oil, water
	High energy biscuits	N/A
	Breast milk substitutes	Cow's milk, DSM or dried whole milk + sugar, oil, water
	Enriched local meals	Cereal flour, pulses, vegetables, meat/fish, oil, DSM, water

* Formula diet F-75

** Formula diet F-100

d. Identify Non-Food Commodities for Selective Feeding Programs (SFPs)

Medecins Sans Frontiere's (MSF) Nutrition Kit was designed to contain all non-food items needed for a feeding program. Nutrition workers can refer to this list to determine what is needed. Most materials may be purchased locally, but if essential utensils are lacking, order kits from MSF or OXFAM.

Table 6-25: Contents of MSF Nutrition Kit

CONTENTS OF MSF NUTRITION KIT	
Nutrition Surveys/Screenings	<ul style="list-style-type: none"> • Salter scales (25 kg), weighing pants, MUAC armbands, height boards, W/H tables, standard 1 kg weights, measuring tapes, nylon rope • Stationery: clipboards, notebooks, pens, pencils, erasers, sharpeners, rulers, permanent markers, calculator, manual counter, scissors • Instructions for survey staff, MSF nutrition guidelines
Screening and Registration for Nutrition Program	<ul style="list-style-type: none"> • ID bracelets, register books, individual monitoring cards, W/H tables, card boxes • Pens, pencils, rubbers, sharpeners, rulers, graph paper
Therapeutic Feeding Program (1 per 60-100 children)	<ul style="list-style-type: none"> • Cooking pots (100 L, 50 L), wooden paddles, plastic cups, plastic bowls, metal and plastic teaspoons, measuring jugs (1 L), measuring spoons, scoops, ladles, whisks, tin openers • Salter scales (25 kg, 50 kg), weighing pants, adult bathroom scale, alarm clocks/batteries • Large food mixing /washing up bowls, scrubbing brushes (floor, pots/pans), plastic water containers (20 L), plastic buckets, torches/batteries, marker pens, plastic potties, soap • Naso-gastric tubes (CH # 8, 10), syringes (60 ml, 200 ml), pestle and mortar • Water filter, water purifying tablets (chloramine) • MSF Nutrition guidelines, milk cards
On-Site Supplementary Feeding Program (1 per 250 children)	<ul style="list-style-type: none"> • Salter scales (25 kg, 50 kg) and weighing pants • Cooking pots (100 L, 50 L), wooden paddles, large food mixing bowls, plastic cups/bowls/teaspoons, metal spoons, scoops, measuring jugs (5L, 1L), measuring spoon, whisks, tin openers • Scrubbing brushes (pots/pans, floor), buckets, water containers, water purifying tablets, bars of soap • MSF Nutrition guidelines, marker pens, alarm clocks/batteries

Source: MSF: Nutrition Guidelines

Other supplies needed for therapeutic or wet feeding programs include:

- **Water** — 30 L/child/day
- **Sanitation** — 1 latrine/50 persons, bed pots for smaller children, waste buckets
- **Shelter** — buildings, tents or plastic sheets, beds/mats, blankets, bed-nets, lamps, torches
- **Fuel** — average 1 m³ firewood to boil 1000 L water
- **Medical Drugs/Supplies** — micronutrient supplements, ORS, intravenous fluids, antimicrobials, measles vaccine and immunisation kits, etc.

e. Estimate Staffing Needs

A successful selective feeding program requires a team of health and non-health staff. The actual number of staff recruited will depend on their skills and prior experience in food and nutrition programs. The following table gives an example of staffing for selective feeding programs:

Table 6-26: Staffing for Selective Feeding Programs

Supplementary Feeding	Therapeutic Feeding
<ul style="list-style-type: none"> • 1 general supervisor per feeding centre • 1 trained nurse per feeding centre • 1 nutrition assistant per 30 children • 2 outreach workers per feeding centre • 1 cook plus assistant per 50 children • 1 cleaner per 50 children • 1 or more watchmen per feeding centre 	<ul style="list-style-type: none"> • 1 medical doctor or medical assistant per feeding centre • 2 trained nurses (for overall program) • 10 nutrition assistants (1 per 10 children) • 2 outreach workers per feeding centre • 1 storekeeper • 4 cooks/assistants • 4 cleaners (2 for feeding centre, 2 for compound) • 1 or 2 watchmen • Caregivers: mothers or other family members

Source: MSF – Nutrition Guidelines

f. Staff Training

Emergency nutrition programs should be implemented by staff members who have the appropriate skills and experience to perform the necessary tasks. In emergencies, most recruited staff need training (on-the-job or periodically) to be able to perform the following tasks satisfactorily:

- Identify individuals with common nutritional disorders and micronutrient deficiencies.
- Advise the affected population on good feeding practices and care of vulnerable groups.
- Advise on safe and appropriate use and preparation of blended foods.
- Keep records of the amount of the number of rations distributed, attendance at selective feeding programs, the quality of food, etc.

Once trained, all staff members need to be adequately managed and supported. See the *Human Resource Management* chapter for further details on supervision of staff.

THE LOGISTICS OF FOOD AID IN EMERGENCIES

The aim of food supply and distribution is to deliver the right amount of food to the right number of refugees at the right time in the right place.

Food Logistics Systems

Most food aid is provided by a few key donors who procure food from their domestic markets, and then pass the food to the World Food Programme and other non-governmental organisations (NGOs). For example:

- The World Food Program provides over \$1 billion a year in food aid to refugees and emergency-afflicted populations.
- UNHCR and other NGOs provide another \$1 billion per year in assistance operations for medical care, environmental health, water and sanitation, and overall operations to ensure livelihood.
- NGOs, the Red Cross, or local government representatives are responsible for implementing food distribution and nutritional programs in the disaster-affected areas.
- Food storage and distribution is carried out largely by members of the affected populations.

Procurement and Transportation of Food

The main costs of food aid programs is the purchase and transportation of food. Food costs may vary from \$100 per metric ton of grains to \$1,500 per metric ton of oil. The largest amounts of procured food are the bulk grains, followed by beans and oil. Specialty foods such as Corn Soy Blend, F-100 re-feeding formula or high-energy biscuits are procured in limited quantities due to their high cost.

Food should be procured as locally as possible because transportation and storage of imported food is very costly. In addition, imported food may upset local market prices and discourage food production. The type of transportation will depend on the urgency of delivering food aid. The following table shows the capacity of various means of transport, in decreasing order of cost.

Table 6-27: Food Aid Carriers and Payloads

CARRIER	PAYLOAD
C-130 Hercules aircraft	21 MT
Truck & Trailer	21-30 MT
Railway freight car	30 MT
Pick up truck (large)	1 MT
Camel	250 kg
Donkey	100 kg

Challenges to Food Aid

Distributing food aid can be very challenging. Food supply and distribution for a large displaced population is one of the most difficult operations to organise. Major problems can arise, which may be complicated by politics and corrupting influences. The relief operation may even seem a wasted effort during the initial phase of an emergency when the beneficiary receives only a meagre supply. The main reason is that procurement and transportation of bulk quantities of food takes several weeks, no matter how well the operation is managed and co-ordinated, or where the food is purchased.

Common problems of food aid include the following:

1. Food Supply Failures

Failures in the food pipeline can interrupt the availability of one or more important commodities. The following steps can be taken to maintain distribution until the food pipeline is restored:

- a. Replace food commodities that are not available with other food items to maintain adequate energy and protein level in the food basket. The following substitution ratios are recommended for common food items:¹⁴
 - Blended food for beans = 1:1
 - Sugar for oil = 2:1
 - Cereal for beans = 2:1
 - Cereal for oil (not oil for cereal) = 3:1
- b. Decrease the distribution of the missing commodity in the general ration
- c. Safeguard the supplies to TFPs
- d. Distribute the deficient commodity via SFPs in the following order of priority: children under five years, pregnant/nursing mothers, older children, and other at-risk groups.
- e. During a prolonged interruption in the food pipeline, the SFP can be expanded to include other at-risk groups, depending on food availability.¹⁵

2. Low Coverage of Vulnerable Groups

Carrying out large-scale food and nutrition programs for complex emergencies covering whole regions can be very difficult and demanding. Local agricultural production and commercial markets are often interrupted or arrested. Identifying and reaching all the vulnerable groups among the entire affected population can be almost impossible, particularly in areas such as western Sudan or intensely disputed areas such as Liberia and Burundi. Increasing the number of delivery points for food aid can help but does not guarantee that all the vulnerable groups will be reached.

3. Excessive Food Losses

Most agencies accept up to 10% losses of the food aid during transportation, storage, and distribution. However, greater quantities of food may be lost due to the following:

- Packing errors — factory may decrease the contents in the bags
- Losses during transportation — bags may get lost or may leak
- Poor quality foods — food may spoil due to poor transport, storage, and handling
- Lack of security — bags may be stolen during transportation, storage, or distribution
- Possession of multiple ration cards or altering the family size information on the cards
- Over-scooping — distributors may give larger amounts to their relatives and friends
- Diversion by staff or beneficiaries

Humanitarian NGOs must establish accounting and inventory systems as soon as possible to manage, track, and account for the movement of food commodities. These are essential for reporting to donors and for determining the priority needs of the beneficiaries. In addition, the quality of food should be monitored, and food safety should be promoted at all levels of the food pipeline. The following commodity or inventory records and accounting systems are commonly used:

- Warehouse ledgers (arrivals, issues)
- Commodity losses and damage
- Stock reports (balance sheets, stock cards)
- Releases from the warehouse (release orders)
- Reports of food in transit (monthly)
- Delivery notes (waybill)

4. Dependency on Food Aid

Assisting displaced people in relief camps is not simple, and reaching those settled among host populations it is even harder. On one hand, the displaced are often fully dependent on external food aid to survive. On the other hand, food aid can induce large populations to uproot themselves and take advantage of relief supplies. This often develops when food is provided at central locations. As a result, dependency is created and indigenous efforts to produce food are disrupted.

5. Declining Food Supply

Each agency will contribute as much emergency assistance as they can at the beginning of an operation. As support for emergency programs declines, programs are scaled down to reduce dependency. However, in complex emergencies, the focus is always short-term, in response to changing circumstances such as movements of armies and bandits. Any significant reduction in food supplies may lead to increased deaths. Programs experiencing declining food supplies can minimise the number of deaths by doing the following:

- Give full ration to only a proportion of the population, and the rest receive nothing.
- Distribute a reduced ration to all people (hard rationing).
- Distribute food to members of the population according to need, i.e., age, sex, size, occupation, pregnancy (fair-share strategy).
- Use nutritional status to determine how much food to allocate to a family or group.
- Better targeting through more accurate data on needs of individual families.
- Reduce or halt food distribution after a harvest.
- Discharge healthy people from the food aid program.

LONG-TERM FOOD INTERVENTIONS

Indirect Food Aid

Successful relief agencies have learned that effective food assistance involves far more than distributing general rations and providing supplementary feeding. When people are starving, most agencies respond by sending food aid, assuming the cause is shortage of food. However, prolonged food aid is expensive, inappropriate and ineffective in promoting the recovery of the affected people. Once nutritional levels have stabilised (for at least three months), relief agencies should shift their focus from direct food aid to developing indirect ways of increasing the food supply and building food security. One or more of the following programs may be used to phase out direct food aid programs:

1. Seeds and Tools Distribution

The aim of seeds and tools distribution is to rehabilitate vulnerable families for future self-sufficiency. It may be carried out as a short- or long-term project since any skills and knowledge gained from the project can benefit displaced people after they return to their place of origin. Local farmers and experts may be consulted to identify the varieties of seeds and plants that grow in the area. Selecting and distributing the seeds and tools to be used should be decided with the beneficiaries. Distribution may target women to ensure that the seeds and tools are not sold. It may be carried out after food distribution to reduce the likelihood of seeds being consumed. Simple planting and growing instructions may be provided in the local language for those who have little experience in farming. After providing the initial inputs, local production of seeds and tools should be encouraged, e.g., through community projects. Further inputs and training may be necessary for long-term projects.

2. Income-Generating Projects (IGP)

Relief agencies may issue small loans and training to the most affected families in order to provide them with alternative sources of income once food aid is phased out. These projects should have a direct impact on improving food production, e.g., digging wells, raising poultry and small livestock, fishing or milling projects.

3. Food-For-Work (FFW) Projects

In these projects, food is given as full or partial payment of wages to people working in land improvement or community development projects. This strategy is very effective during food shortages, particularly when it targets the poor. It allows able-bodied individuals to earn food rather than become reliant on food handouts. The types of food used for payment will depend on the objectives of the project. The cash value of food to be distributed should be the primary consideration if the aim is income transfer. People are often paid every two or four weeks, at a rate of one family ration per day worked. The amount of food they receive should be sufficient to motivate them to work, without upsetting local food production or markets.

Table 6-28: Advantages and Disadvantages of Food-For-Work (FFW) Projects

ADVANTAGES OF FFW	DISADVANTAGES OF FFW
<ul style="list-style-type: none">• Gets food to needy families• Less likely to create dependencies• Effective in getting projects done	<ul style="list-style-type: none">• Requires more food than general distribution• People may sell food for other needs• May lower market prices and discourage local food production

To ensure that FFW projects do not interfere with local productivity, they should be carried out over a short period of time, and not during planting and harvesting seasons.

4. Cash-For-Work (CFW) Projects

The aim of these projects is to provide income for people involved in public works or community development projects. CFW programs can be designed to improve local food production (e.g., planting wind breaks). People are paid for completing a piece of work. Families that cannot afford to purchase food at any price are given priority for employment in these projects. Women are also employed. Organising CFW programs is simpler than FFW programs since they do not depend on a food distribution system. Paying workers a modest wage preserves their dignity and gives them a choice on what to spend their money on (which may not be food, as it is intended), whereas high wages may attract skilled workers (and farmers) from other jobs.

5. Market Interventions

During periods of food shortages, food prices usually rise so much that the poorest are not be able to purchase food. Distributing food to needy people will not make the food prices more affordable. Market interventions are more effective in lowering or controlling food prices. They reactivate markets faster, cost less, and require fewer people to implement them. The following market interventions may be appropriate for emergencies:

- *Internal purchase programs* — The amount of food available in areas of conflicts, famines, or other emergencies is much higher than expected. Food shortages occur because of problems in distribution or access. Instead of importing food aid, local food reserves may be purchased and sold at lower prices to local vendors or distributed to affected people through selective feeding programs. Purchasing food aid locally is faster, cheaper, and helps reactivate the local markets. In addition, the

food commodities are more familiar to the affected population. Care must be taken to ensure the internal purchase programs do not disrupt the local economy.

- *Monetisation* — This involves selling food aid directly to local vendors (particularly women) at subsidised rates so that food prices remain affordable for the poor. After the sale, vendors should be monitored to ensure they sell their food within the normal retail price range. Those who sell their food at higher prices or to wholesalers are not allowed to purchase any more food aid.

Note: *Some donors may limit food aid to free distribution only.*

- *Livestock interventions* — Relief agencies may pay grain in exchange for livestock whose health is deteriorating due to existing food shortages. This helps to preserve the value of livestock and provides income for pastoralists.

**For further details about the long-term food interventions, please refer to the texts listed under the References and Suggested Readings section at the end of the chapter.*

Fortification of Relief Foods

Fortification is the addition of nutrients to food somewhere in the food processing cycle for the purpose of restoring or enhancing the nutritional quality. *Micronutrient fortification* (the addition of vitamin A, thiamin, niacin, vitamin C, iron, iodine, or other micronutrients to foods) is one of the most cost-effective programs known for improving health and reducing disability.

It is possible to fortify emergency foods with about 20 vitamins and minerals using low-cost technology. Costing less than \$10 per metric ton of delivered grain, fortification may be performed at the field-level or regional level, as follows:

1. Field-Based Fortification

Relief agencies may fortify food aid in camp-based grain mills to meet the nutritional needs of a target population. Carrying out fortification at the field level is less expensive for three reasons:

- the addition of micronutrients does not involve other processes
- the closer to the point of consumption, the fewer the problems of storage and spoilage
- fortifying flour during milling in a refugee camp reduces the cost of labour and increases the shelf-life of the grain mix since vitamins and minerals are added close to the time of consumption

However, due to lack of equipment for mixing or dosing with micronutrient premix, mills in refugee camps usually do not guarantee proper fortification. Opportunities for improvement are limited because most mills are privately owned and the millers lack incentives to fortify foods properly. In order to relieve individual refugees of the burden of pounding their grains or paying high fees to commercial millers, humanitarian agencies are becoming interested in providing equipment and sometimes resources for maintenance. Not only do milling projects produce economic benefits, but they allow refugees to spend less time travelling outside camps for fuel wood required to cook bulk grains. Supporting milling projects, therefore, may initiate and promote the practice of fortification into a local industry.

2. Regional Fortification

Building local and regional capacity for fortification of emergency food aid may help make fortification a standard practice across Africa. Food aid may be passed through sophisticated roller mills at a regional level to produce fortified food. However, many commercial millers lack the necessary equipment, micronutrient premix, or experience. In addition, processing and fortifying large quantities of food at a centralised location increases the likelihood of spoilage (especially in high humidity areas). Therefore, fortification at the regional level is appropriate where relief food or locally purchased food commodities pass through major industrial centres or where food is stored for contingency purposes.

Challenges to Fortification

Certain challenges to fortification have been identified, such as the following:

1. Except for blended food, few other relief foods provide sufficient micronutrients. However, blended foods such as Corn Soy Blend, Unimix, and Wheat Soy Blend tend to be considerably more expensive than bulk grains.
2. Whole grains cost between \$90 and \$200 per metric ton. On the other hand, processing and packaging blended foods increase the cost by as much as \$350 and \$500 per metric ton. Because two or three times more emergency victims can be fed using bulk grains than blended foods, most aid agencies reserve the enriched foods primarily for selective (supplementary) feeding programs that target those people who already show signs of nutritional deficiencies.
3. Blended foods spoil more readily than whole grains. This is because mixing and blending grains and infestation at the factory site reduces their shelf-life. Despite manufacturer claims that their food products have many years of shelf-life, many relief agencies confirmed the spoilage of flour after a few weeks or months. They frequently have had to condemn and destroy entire batches.
4. Studies have shown that among displaced families, foods are consumed in different proportions. Only bulk grains appear to be eaten by everyone (in varying quantities). Therefore, it has been recommended that one effective way of achieving broad coverage of a population with micronutrients, is through the fortification of bulk grains, such as wheat, maize, and rice.

Note: *The number of food aid commodities that are likely to be fortified in the near future is increasing. These include staples, maize/wheat flour, blended cereals, dry skim milk, oil, salt, and sugar.*

MONITORING AND EVALUATING FOOD AND NUTRITION PROGRAMS

Once the food and nutrition program is established, monitoring can determine whether the program is achieving the expected results, using resources effectively, and reaching the expected standards and targets. (Refer to the *Management* chapter for more information.)

Monitoring Food Aid

Food aid programs must be monitored in a systematic manner in order to:

- document the effectiveness of the program in meeting its goals, objectives, and targets
- monitor the use of the food aid distributed
- monitor the impact of the program on the food security status of the target population

The following indicators may be used to monitor food supply and distribution:

- Periodic Inventory Reports produced every 14 days — inventory reports detailing receipts, issues, and stock balances are available for program planners
- Inventory Information used as a basis for program planning — system provides information on pledges, expected arrivals, and stocks available for programming.

It is expected that NGOs involved in distributing food aid will monitor how the food is used by the affected population. This monitoring will include the following:

- accounting and reporting along the supply chain (from origin to delivery to distribution sites)
- distribution to intended beneficiaries confirmed through records and random checks
- random household-level end-user visits to determine the acceptability and usefulness of the ration received

Monitoring end-users through household-level visits and interviews will provide feedback from the beneficiaries about the effectiveness of the food security intervention. Program evaluations should be conducted periodically and findings used to improve the running of the program, where necessary, and to provide “lessons-learned” for future operations.

Monitoring Emergency Nutrition Programs

Indicators for monitoring the outcome of nutrition programs need to be developed and agreed upon when designing the program. Indicators that may help measure the impact of the general distribution on the population include: morbidity, mortality, nutritional status, or income/self-provisioning levels.

The efficiency and effectiveness of Selective Feeding Programs should be monitored through ongoing data collection and analysis. This may include growth monitoring, nutrition surveys, and feeding centre records. Specific indicators for each selective feeding program are listed in the table below.

Table 6-29: Examples of Indicators for Selective Feeding Program

	ACCEPTABLE	ALARMING
SFP INDICATORS		
1. Recovery rate	Greater than 70%	Less than 50%
2. Death rate	Less than 3%	Greater than 10%
3. Defaulting rate	Less than 15%	Greater than 25%
TFP INDICATORS		
4. Recovery rate	Greater than 75%	Less than 50%
5. Death rate	Less than 10%	Greater than 15%
6. Defaulter rate	Less than 15%	Greater than 25%
7. Weight gain	Greater than or equal to 8 g/kg/day	Less than or equal to 8 g/kg/day
8. Coverage	Greater than 50-70%	Less than 40%
9. Mean length of stay	Less than 3-4 weeks	Greater than 6 weeks

It is important to monitor the number of cases presenting in health facilities with *scurvy*, *pellagra*, and *beriberi*, the most commonly observed micronutrient disorders in emergencies. Individual cases are most likely the result of limited access to certain foods. This may indicate a population-wide problem that requires population-wide interventions. Special attention should be paid to iron deficiency anaemia, which may be a common cause of death.

Evaluating Food and Nutrition Programs

Evaluating food and nutrition programs is important because it measures their effectiveness, identifies lessons for future preparedness, mitigation, and assistance, and promotes accountability. Sometimes, it helps determine a need to shift strategies in response to changes in the needs or disaster context. All programs should be evaluated in terms of set objectives and agreed standards. Information from the initial assessment and ongoing monitoring should be fed into program reviews and evaluations.

The following minimum standards from the Sphere Project can be used for evaluating the effectiveness and impact of an emergency food aid and nutrition program:

Note: For more details about monitoring and evaluating relief projects, refer to the Management chapter.

Table 6-30: Minimum Standards in Food Aid

MINIMUM STANDARDS IN FOOD AID	
1. ANALYSIS	Before any program decisions are made, there is a demonstrated understanding by policy makers and program implementers of the basic conditions that create risk of food insecurity and the need for food aid.
	The performance and effectiveness of the food aid and nutrition programs and changes in context are monitored and evaluated.
	The disaster-affected population has the opportunity to participate, where possible, in the design and implementation of the assistance program.
2. REQUIREMENTS	The food basket and rations are designed to bridge the gap between the affected population's requirements and their own food sources.
3. TARGETING	Recipients of food aid are selected on the basis of food need and/or vulnerability to food insecurity.
4. RESOURCE MANAGEMENT	Food aid commodities and program funds are managed, tracked, and accounted for using a transparent and auditable system.
5. LOGISTICS	Agencies have the necessary organisational and technical capacity to manage the procurement, receipt, transport, storage, and distribution of food commodities safely, efficiently, and effectively.
6. DISTRIBUTION	The method of food distribution is equitable and appropriate to local conditions. Recipients are informed of their ration entitlement and its rationale.
7. HUMAN RESOURCE CAPACITY & TRAINING	Food aid programs are implemented by staff who have appropriate qualifications and experience for the duties involved, and who are adequately managed and supported.
	Local capacity and skills are used and enhanced by food aid programs.

Table 6-31: Minimum Standards in Nutrition

MINIMUM STANDARDS IN NUTRITION	
1. ANALYSIS	Before any program decisions are made, there is a demonstrated understanding of basic nutritional situation and conditions that may create risk of malnutrition.
	There is a clear description of the problems and a documented strategy for a proper response.
	The performance and effectiveness of the food aid and nutrition programs and changes in context are monitored and evaluated.
	The disaster-affected population has the opportunity to participate in the design and implementation of the assistance program.
2. GENERAL NUTRITIONAL SUPPORT	The nutritional needs of the population are met.
	Food that is distributed is of sufficient quality and is safely handled so as to be fit for human consumption.
	Foods that are provided are appropriate and acceptable to the entire population.
	Food is stored, prepared, and consumed in a safe and appropriate manner, both at the household and community level.
3. NUTRITIONAL SUPPORT	The public health risks associated with moderate malnutrition are reduced.

FOR THOSE WHO ARE MALNOURISHED	Mortality, morbidity, and suffering associated with severe malnutrition are reduced.
	Micronutrient deficiencies are corrected.
4. HUMAN RESOURCE CAPACITY AND TRAINING	Nutrition interventions are implemented by staff who have appropriate qualifications and experience for the duties involved, and who are adequately managed and supported.
	Members of the disaster affected population receive support to enable them to adjust to their new environment and to make optimal use of the assistance provided to them.
	Local capacity and skills are used and enhanced by emergency nutrition programs.

APPENDIX

Table 6-32: Definitions of Malnutrition

	TOTAL MALNUTRITION	MODERATE MALNUTRITION	SEVERE MALNUTRITION
CHILDREN AGED 6-59 MONTHS	<ul style="list-style-type: none"> • Less than -2 Z scores WFH or • 80% median WFH or • Less than 12.5 cm MUAC +/or nutritional oedema 	<ul style="list-style-type: none"> • -3 to less than -2 Z scores WFH or • 70% to 80% median WFH or • 11.0 to less than 12.5 cm MUAC 	<ul style="list-style-type: none"> • Less than -3 Z scores WFH or • Less than 70% median WFH or • Less than 11.0 cm MUAC +/or • Nutritional oedema
CHILDREN AGED 5-9.9 YEARS	<ul style="list-style-type: none"> • Less than -2 Z scores WFH or • 80% median WFH +/or • nutritional oedema 	<ul style="list-style-type: none"> • -3 to Less than -2 Z scores WFH or • 70% to 80% median WFH 	<ul style="list-style-type: none"> • Less than -3 Z scores WFH or • Less than 70% median WFH +/or • nutritional oedema
ADOLESCENTS AGED 10-19.9 YEARS*	<ul style="list-style-type: none"> • Less than -2 Z scores BMI-for-age or • Less than -2 Z scores BMI-for-height +/or nutritional oedema 	<ul style="list-style-type: none"> • -3 to less than -2 Z scores BMI-for-age or • -3 to less than -2 Z scores BMI-for-height 	<ul style="list-style-type: none"> • Less than -3 Z scores BMI-for-age or • Less than -3 Z scores BMI-for-h height +/or nutritional oedema
ADULTS AGED 20-59.9 YEARS**	<ul style="list-style-type: none"> • BMI < 17 +/or • Nutritional oedema 	<ul style="list-style-type: none"> • 16 to < 17 BMI 	<ul style="list-style-type: none"> • < 16***

Source: The Sphere Project, 1999

* The BMI cut-offs for adolescents have not been agreed upon. Therefore they should be used with caution, and always combined with clinical assessment.

** BMI cut-offs for adult malnutrition are for chronic energy deficiency.

*** Need to correct for variations of BMI between populations. Should also distinguish between those with rapid-onset, severe malnutrition to those who are chronically energy deficient.

Note: There are no agreed anthropometric cut-offs for malnutrition in infants below six months apart from the presence of nutritional oedema. To determine whether malnutrition is a problem for this age group, assess the infant feeding practices, including access to breast milk and support for nursing mothers.

Use of Milk in Emergencies

In disaster situations, milk has frequently been requested or donated in various forms for distribution to affected populations. Fresh milk and milk products (cow's milk that is powdered, condensed, evaporated, or otherwise) are rich sources of many essential nutrients. They have a high protein quality but relatively low energy and can be consumed by people of all ages. However, uncontrolled distribution of milk can produce many unwanted effects, such as the following:

- Serious health problems due to improper dilution or contamination and indigestion due to lactose intolerance.
- Changing dietary habits among communities that do not traditionally consume milk, and thereby creating new needs and economic pressures.
- Transportation and storage problems — This requires careful supervision of supplies to prevent distributing contaminated or damaged sacks, tins, or expired milk.

The following table summarises some guidelines on the safe use of milk in emergencies.

Table 6-33: Guidelines for Safe Use of Milk in Emergencies

SAFE USE OF MILK IN EMERGENCIES
<ul style="list-style-type: none">• Milk is to be distributed only to those populations who traditionally rely on milk and only under strictly controlled and hygienic conditions.• Milk must neither be used as an item for general distribution nor as a “take-away” supplement.• Donations of milk for relief actions should only be made following a specific appeal from the implementing relief agency.• Unsolicited donations of milk will not be used if they do not satisfy bullet point 1. Donors will be advised that they should withdraw their donation or that it will be safely disposed.• Dried skimmed milk that has not been fortified with vitamin A will not be supplied or distributed.• Milk in tins or pre-packaged in liquid or semi-liquid form will not be supplied or distributed.

Source: IFRC Handbook for Delegates

Basic Principles for Selective Feeding Programs¹⁶

Every situation has individual features that lead to different objectives and to different approaches to Selective Feeding Programs. These guidelines describe the basic principles and design elements of the food and nutrition aspects of Selective Feeding Programs. These guidelines cannot cover the wide range of situations. Supplementary feeding programs, therefore, should be designed according to the situation but should nevertheless remain in line with the framework of these guidelines.

Basic Principles:

1. In emergency situations, WFP, UNHCR, and implementing agencies try to ensure the provision of an adequate general food rations. However, additional food may be needed over a certain period of time for specific groups who are already malnourished or are at risk of becoming malnourished.
2. These interventions have to be seen in the context of a general ration being distributed. The impact of Selective Feeding Programs aimed at compensating for inadequate general rations has proven very limited and not cost-effective. Therefore, to be effective, the extra ration must be *in addition to* and not *a substitute for* the general ration.
3. Many factors influence nutritional status. It therefore should be kept in mind that interventions must be multi-sectoral and cover food, health, hygiene, sanitation and care. A properly designed nutrition survey and complementary analysis of the causes of malnutrition can help to guide the need to implement Selective Feeding Programs.
4. National health authorities and NGOs have an important role to play in nutritional interventions. In emergency situations, NGOs usually organise and implement Selective Feeding Programs. They form an integral part of the efforts to prevent and treat malnutrition among young children, women, and other at-risk groups.
5. Selective Feeding Programs should have clear objectives and criteria for opening, admission, discharge, and closure. These objectives should be defined at the beginning. In order to be effective, Selective Feeding Programs need to be integrated into Community Health Programs, which offer health and nutrition services like Safe Motherhood, immunisations, nutrition and health education and growth monitoring. Integration facilitates referrals between services and phasing out of Selective Feeding Programs.

6. In addition to nutritional and medical treatment, care is an essential part of rehabilitation. Care in nutrition refers to the practices of the caregivers in the household, which translates food security and health care into rehabilitation, growth and development. These practices include care for women, breast-feeding, infant feeding, psycho-social care, sanitation and hygiene practices, food processing and preparation, and home health practice. These issues can be addressed through Selective Feeding Programs in the form of education, individual counselling, social activities and involvement of caretakers in the program.
7. The community must be consulted to the extent possible during program design and women must take part in the decision making from the outset.
8. Proximity of feeding centres to the population and availability of trained health staff are a prerequisite when Selective Feeding Programs are being considered.
9. The policy of UNHCR and WFP concerning safe and appropriate infant and child feeding, in particular the protection, promotion, and support of breast feeding must be respected.
10. When planning the food needs of Selective Feeding Programs, the energy density, fat, protein, and micronutrient content of food commodities must be considered. In addition, micronutrient supplements (especially vitamin A, iron, and folic acid) should be given.
11. It must be kept in mind that adolescents, adults, and elderly people may also be malnourished and should be included in Selective Feeding Programs.
12. The effectiveness of Selective Feeding Programs, and their impact on mortality and morbidity of affected populations should be monitored regularly.
13. The need to set up Selective Feeding Programs after the initial stage of an emergency often represents a serious warning that the assistance to the population as a whole is insufficient.
14. For interpretation of nutrition surveys, results are presented both in weight-for-height Z-scores and percentage of the median. However, during admission and discharge to feeding programs, percentage of the median is often being used. At present, no consensus has yet been reached on the use of Z-score in feeding programs.
15. The standards mentioned in these guidelines meet the set of minimum standards in disaster response as mentioned in the Sphere Project.

REFERENCES AND SUGGESTED READINGS

1. International Federation of the Red Cross and Red Crescent Societies. Handbook for Delegates, 1997. Geneva, Switzerland.
2. Medecins Sans Frontieres. Refugee Health Care: An approach to emergency situations, 1997.
3. Medecins Sans Frontieres. Nutrition Guidelines. Paris, 1995.
4. Emergency Nutrition Network. *Field Exchange*. Special Focus: Micronutrients, Issue (5), October 1998.
5. WHO/UNHCR/WFP/IFRC. The Management of Nutrition in Major Emergencies, 2000.
6. UNHCR/WFP Guidelines for Selective Feeding Programmes in Emergency Situations, February 1999.
7. WFP/UNHCR Guidelines for Estimating Food and Nutritional Needs in Emergencies, December 1997.
8. Steve Hansch. Enhancing the Nutritional Quality of Relief Diets: Overview of knowledge and experience, April, 1999.
9. WFP/UNHCR Guidelines for Locating EDPs and Operating EDP Storage Facilities, March 1997.
10. Catherine Mears with Helen Young. Acceptability and Use of Cereal-Based Foods in Refugee Camps: Case Studies from Nepal, Ethiopia and Tanzania, Oxfam 1998.
11. Edward Clay and Olav Stokke. Food Aid Reconsidered: Assessing the Impact on Third World Countries. EADI Book Series II. Frank Cass, London 1995.
12. World Health Organisation. Management of Severe Malnutrition: A manual for physicians and other senior health workers. Geneva 1999.
13. World Health Organisation. Rapid Health Assessment Protocols for Emergencies, Geneva 1999.
14. Douglas Johnson. Distributing Seeds and Tools in Emergencies, Oxfam 1998.
15. The Sphere Project. Humanitarian Charter and Minimum Standards in Disaster Response. Minimum Standards in Nutrition.
16. The Sphere Project. Humanitarian Charter and Minimum Standards in Disaster Response. Minimum Standards in Food Aid.
17. Bread for the World. The Changing Politics of Hunger. Hunger 1999, Ninth Annual Report on the State of the World Hunger.
18. Eric Noji. The Public Health Consequences of Disasters. New York: Centre for Disease Control and Prevention, 1997.
19. Cuny FC and Richard RB. Famine, Conflict and Response: A basic guide. Kumarian Press, 1999.
20. Food and Agriculture Organisation of the United Nations. Food and Nutrition in the Management of Group Feeding Programmes, Rome 1993.
21. UNHCR. Handbook for Emergencies, second edition.

¹ The United Nations ACC/SCN Second Report on the World Nutrition Situation in 1992.

² The Changing Politics of Hunger. Hunger 1999. "Update on State of the World Hunger."

³ S Baker, E Jacob "Iron" in Warren and Mahmoud 1990 *Tropical and Geographical Medicine* 2nd Edition.

⁴ From the Food Policy and Nutrition Division, Food and Agricultural Organisation, Rome.

⁵ Adapted from the IFRC Handbook for Delegates, 1997.

⁶ Presentation by Rita Bhatia, UNHCR. Enhancing the Nutritional Quality of Relief Diets Workshop. April 28-30, 1999, Washington DC, USA.

⁷ WFP/UNHCR Guidelines for Estimating Food and Nutrition Needs in Emergencies, Dec 1997.

⁸ Lancet, Vol. 340, Nov 28, 1992. *Misconception on Nutrition of Refugees*.

⁹ WHO Press Release WHA/10. The World Health Assembly Reaffirms the Importance of Breast-Feeding for Infants World-wide. May 1994.

¹⁰ Ibid.

¹¹ Anthropometric indicators relate each child's measurements with the expected value of a child of the same age (or height) from a reference population or reference stands. The international reference standards are based on two surveys of American children.

¹² Steve Hansch. Enhancing the Nutritional Quality of Relief Diets: Overview of knowledge and experience, April 1999.

¹³ WFP/UNHCR Guidelines for Estimating Food and Nutrition Needs in Emergencies, Dec 1997.

¹⁴ Ibid.

¹⁵ UNHCR/WFP Guidelines for Selective Feeding Programs in Emergency Situations, February 1999.

¹⁶ Ibid.