

A User's Guide

MODULE 4. Nutrition Support

MARCH 2018



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WHAT IS NUTRITION SUPPORT?

Nutrition support to prevent and treat malnutrition is one of the components of nutrition, assessment, counseling, and support (NACS) (see [Module 1](#) for more information on NACS). It includes nutrition-specific¹ interventions such as counseling on infant and young child feeding (IYCF) and optimal dietary habits and the provision of micronutrient supplements and specialized food products to address the immediate (direct) causes of malnutrition. It also includes nutrition-sensitive² interventions that can help improve food security, nutritional status, and health outcomes, such as water, sanitation, hygiene, early childhood development, agriculture, and education interventions, as well as referral to economic strengthening and livelihood support. Some aspects of nutrition support such as therapeutic and supplementary food prescriptions can only be provided by trained health care providers. However, all aspects can be promoted and supported at the community level. Note, nutrition support is used to address nutrition issues only; medical treatment for co-morbidities or other illnesses should be addressed additionally by a health care provider but are not discussed in this module.

This module covers the main nutrition-specific and nutrition-sensitive interventions that are used in NACS. It discusses the following nutrition-specific interventions: provision of micronutrient supplements and specialized food products to prevent and treat malnutrition. Two other important interventions to prevent and address malnutrition are nutrition education and counseling. However, these interventions are covered in depth in [Module 3](#) and therefore are not discussed in this module. Although it is outside of the scope of this module to cover all relevant nutrition-sensitive interventions, this module also covers the following nutrition-sensitive interventions: water, sanitation, and hygiene (WASH) support; and economic strengthening and livelihood support.

¹ Bhutta, ZA et al. 2013. "Evidence-Based Interventions for Improvement of Maternal and Child Nutrition: What Can Be Done and at What Cost?" *The Lancet*. Vol. 382 (9890): 452–477.

² Ruel, MT and Alderman, H. 2013. "Nutrition-Sensitive Interventions and Programmes: How Can They Help to Accelerate Progress in Improving Maternal and Child Nutrition?" *The Lancet*. Vol. 382 (9891): 536–551.



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What nutrition conditions are covered in this module?

AMONG CHILDREN (INCLUDING ADOLESCENTS)

Stunting (chronic malnutrition) occurs when a child grows poorly because of the long-term effects of inadequate diet and/or frequent illness and is much shorter than would be expected for a healthy child the same age. Stunted children are more likely to die of infectious diseases and to have compromised cognitive and motor development than well-nourished children.³

Acute malnutrition occurs when a child is wasted (too thin compared to a healthy child)—because of rapid weight loss or inadequate weight gain—or experiences bilateral pitting edema. It is caused by an inadequate amount or quality of food, severe and/or repeated infections, or a combination of these. It is identified using weight-for-height (children under 5), BMI-for-age (children 5–19 years), and/or mid-upper arm circumference (MUAC), and by assessing for bilateral pitting edema. Treatment is based on the severity of the condition.

- A child with **moderate acute malnutrition (MAM)** is moderately wasted (low weight-for-height, BMI-for-age, and/or MUAC) and does not have bilateral pitting edema. Children with MAM are three times more likely to die of infectious diseases than well-nourished children.⁴ Little agreement exists on affordable and scalable treatments for MAM. However, addressing MAM is important to ensure children grow and develop optimally and to prevent their nutritional status from deteriorating to SAM.
- A child with **severe acute malnutrition (SAM)** is severely wasted (very low weight-for-height, BMI-for-age, and/or MUAC) and/or has bilateral pitting edema. Children with SAM are up to nine times more likely to die than well-nourished children⁵ and require urgent medical treatment and specialized foods to recover. Because of breastfeeding, children under 6 months were once considered to be at low risk for SAM; however, it is now recognized that young infants are also at risk for SAM.

3 Black, RE et al. 2013. "Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries." *The Lancet*. 382 (9890): 427–451; Grantham-McGregor, S et al. 2007. "Developmental Potential in the First 5 Years for Children in Developing Countries." *The Lancet*. 369 (9555): 60–70; Hoddinott, J et al. 2008. "Effect of a Nutrition Intervention During Early Childhood on Economic Productivity in Guatemalan Adults." *The Lancet*. 371 (9610): 411–416.

4 Black, RE et al. 2008. "Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences." *The Lancet*. 371 (9608): 243–260.

5 Black, RE et al. 2008. "Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences." *The Lancet*. 371 (9608): 243–260; WHO and UNICEF. 2009. *The WHO Child Growth Standards and the Identification of Severe Acute Malnutrition in Infants and Children*. Geneva: WHO.

ADULTS

Underweight/thinness occurs when an adult's weight is too low for his/her height. It can be caused by rapid weight loss over a short period, or it can reflect chronic (long-term) malnutrition. Underweight/thinness may result from inadequate dietary intake (quantity or quality); severe, repeated, or chronic infections/illness (e.g., tuberculosis, HIV/AIDS, cancer); or a combination of inadequate diet and disease. In addition to increased risk of infection, slower recovery from illness, and increased risk of death,⁶ underweight adults also have reduced work capacity and productivity.⁷ In adults, underweight is categorized by degree of thinness, often referred to as degree of malnutrition (see below).

- **Moderate malnutrition (MAM in this module)** refers to moderate thinness, as identified by low BMI and/or low MUAC (under a certain cutoff). For more information on cutoffs see the MAM management section below. MAM results from inadequate intake (quantity or quality) and/or utilization of food; severe, repeated, or chronic infections/illness (e.g., tuberculosis, HIV/AIDS, cancer); or a combination of these.
- **Severe malnutrition (SAM in this module)** refers to severe thinness, as identified by low BMI, low MUAC (under a certain cutoff), and/or the presence of bilateral pitting edema of nutritional origin. For more information on cutoffs see the SAM treatment section below. Adults suffering from SAM are at increased risk of death. Individuals with SAM need medical treatment and require specialized therapeutic foods to recover.⁸

A NOTE ON MALNUTRITION TERMINOLOGY

In children under 5 years of age, differentiating between chronic and acute malnutrition is reasonably straightforward because there are distinct anthropometric indicators and manifestations (i.e., chronic malnutrition refers to stunting; acute malnutrition refers to wasting or bilateral pitting edema).

For adults, who have stopped gaining height, it can be difficult to determine whether the nutrition condition is acute or chronic based on anthropometric indicators. Therefore, the nutrition condition is often simply referred to as moderate malnutrition or severe malnutrition. However, programs around the globe often use the terms MAM and SAM to describe adult malnutrition. Therefore, this module has continued to use those terms for both children and adults.

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6 Navarro-Colorado, C. 2006. *Adult Malnutrition in Emergencies: An Overview of Diagnosis and Treatment—Field Guidelines*. France: Action Contre la Faim (ACF); Flegal, KM, Graubard, BI, Williamson, DF, and Gail, MH. 2005. "Excess Deaths Associated with Underweight, Overweight, and Obesity." *JAMA*. 293 (15): 1861–1867.

7 WHO. 1995. *Physical Status: The Use and Interpretation of Anthropometry—A Report of WHO Expert Committee*. Geneva: WHO.

8 WHO. 2011. *Integrated Management of Adolescent and Adult Illness (IMAI) District Clinician Manual: Hospital Care for Adolescents and Adults—Guidelines for the Management of Illnesses with Limited Resources. Volume 2*. Geneva: WHO.



Functions and sources of select micronutrients and signs of deficiency

Micronutrient deficiencies (children and adults)

Often called “hidden hunger,” micronutrient deficiencies are a leading cause of preventable blindness, neural tube defects, and intellectual and developmental disabilities. They are both an underlying and a direct cause of maternal and neonatal morbidity and mortality. Deficiencies of vitamins and minerals, especially iron, iodine, vitamin A, and zinc, are still prevalent around the world.

Children under 5 and pregnant women are at highest risk of micronutrient deficiencies, which are particularly harmful when they occur during the first 1,000 days (from pregnancy through the child’s second birthday). For example, children born to women with iron deficiency anemia are more likely to have a low birth weight, be born preterm, die in the first month of life, and be stunted by age 2 and women with calcium and/or iron deficiencies have a higher risk of dying from pregnancy-related causes.⁹

Rapid growth and inadequate diets make young children particularly vulnerable to micronutrient deficiencies. Typically, exclusively breastfed infants receive all their nutritional needs from breastmilk (if the mother is not malnourished) from 0–6 months of age. Beginning at 6 months of age, when complementary feeding of family foods begins, children are likely to develop micronutrient deficiencies if their families are unable to provide optimal complementary foods and practice optimal feeding behaviors. Therefore, micronutrient supplementation for children 6–23 months of age may be necessary and particularly beneficial.



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⁹ Black, RE et al. 2008. “Maternal and Child Undernutrition: Global and Regional Exposures and Health Outcomes.” *The Lancet*. 371 (9608): 243–260. Black, RE et al. 2013. “Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries.” *The Lancet*. 382 (9890): 427–451.

What are nutrition-specific interventions under NACS?

Under NACS, programs that aim to prevent **chronic undernutrition** include nutrition counseling (see [Module 3](#)) to promote optimal nutrition practices (including counseling on optimal IYCF), monthly growth monitoring for the first 2 years of life, and nutrition support such as provision of fortified food rations and/or micronutrient supplementation. Because the linear growth deficits that contribute to stunting in children under 5 typically begin during the first 1,000 days of life and accumulate over time, program efforts focus on prevention interventions during pregnancy and the first 2 years of life.

Interventions that aim to prevent **acute undernutrition** focus on preventing non-malnourished individuals from becoming malnourished and preventing the conditions of individuals classified with MAM from worsening to SAM. Nutrition support programs that prevent acute malnutrition usually involve large-scale distribution of supplementary food products, including fortified-blended food (FBF) such as corn soya blend (CSB), Super Cereal, lipid-based nutrient supplements (LNS), and vitamin and mineral supplements.

Provision of FBF such as CSB and wheat-soy blends. FBF is partially precooked, milled, and blended cereals, soya, beans, and pulses that have been fortified with micronutrients (vitamins and minerals). A study in Haiti examined the ability of two program models (preventative versus recuperative interventions) to reduce childhood stunting, wasting, and underweight. The results demonstrated that the provision of FBF, as part of an intervention package, was effective in preventing undernutrition.¹⁰ See Box 1, on the next page, for an example of a preventative approach to reduce malnutrition among children under 2 years of age.

Provision of lipid-based nutrient supplements. LNS refers to a range of lipid-based products that contain a blend of macronutrients and micronutrients. Several studies assessing the effect of LNS provision on malnutrition prevention have shown positive results in children at high risk of undernutrition.¹¹ In addition, a 2013 WHO review of current evidence found that macronutrient supplementation had positive effects on adult weight gain

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10 Ruel, MT et al. 2008. "Age-Based Preventive Targeting of Food Assistance and Behavior Change and Communication for Reduction of Childhood Undernutrition in Haiti: A Cluster Randomized Trial." *The Lancet*. 371 (9608): 588–595.

11 Defourmy, I et al. 2009. "A Large-Scale Distribution of Milk-Based Fortified Spreads: Evidence for a New Approach in Regions with High Burden of Acute Malnutrition." *PLoS ONE*. 4: e5455; Isanaka, S et al. 2010. "Reducing Wasting in Young Children with Preventive Supplementation: A Cohort Study in Niger." *Pediatrics*. 126: e442-50; Isanaka, S et al. 2009. "Effect of Preventive Supplementation with Ready-To-Use Therapeutic Food on the Nutritional Status, Mortality, and Morbidity of Children Aged 6 to 60 Months in Niger: A Cluster Randomized Trial." *JAMA*. 301: 277–285; Dewey, KG et al. 2017. "Lipid-based Nutrient Supplementation in the First 1000 Days Improves Child Growth in Bangladesh: A Cluster-Randomized Effectiveness Trial." *Am J Clin Nutr*. 105: 944–957.

and adherence to medication in people with HIV.¹² Similarly, a study among people with HIV in Vietnam found that the provision of RUTF (a large-quantity LNS) was acceptable to both adults and children and resulted in significant weight gain among both groups.¹³ While the evidence is still limited, studies have provided useful information on the costs and cost-effectiveness of LNS supplementation.¹⁴

MANAGEMENT OF MODERATE ACUTE MALNUTRITION

Qualified health care providers should assess the nutritional status of their patients to identify individuals with MAM (see Module 2). MAM is defined in children 6–59 months as having a MUAC ≥ 115 to < 125 mm or a weight-to-height z-score ≥ -3 and < -2 in children 0–59 months. For children/adolescents 5–19 years of age, MAM (moderate thinness) is defined as a BMI-for-age z-score ≥ -3 to < -2 and among adults a BMI of < 18.5 – 16.0 .¹⁵ There are no standard global MUAC cutoffs to identify MAM in older children, adolescents, and adults; therefore, different countries use different MUAC cutoffs. Note, most countries also have separate cutoffs for pregnant and lactating women.

12 Willumsen, J. 2013. “Macronutrient Supplementation for People Living with HIV/AIDS: Biological, Behavioural and Contextual Rationale.” WHO eLibrary of Evidence for Nutrition Actions (eLENA).

13 Wieringa, FT et al. 2013. *Acceptability of Two Ready-to-Use Therapeutic Foods among HIV-Positive Patients in Vietnam*. Washington, DC: FHI 360.

14 See the Rang Din Nutrition Study in Bangladesh as an example.

15 WHO. 2007. *Growth Reference Data for 5–19 Years*. Geneva: WHO.

BOX 1 PREVENTING MALNUTRITION IN CHILDREN UNDER 2 APPROACH (PM2A)

Research has found that individual and combined food supplementation and nutrition education interventions targeted to children 6–23 months and their caregivers have improved nutritional status in children.^a One approach that provides targeted interventions during the 1,000-day window of opportunity (the period of rapid growth that occurs during the first 1,000 days of life) is the Preventing Malnutrition in Children under 2 Approach (PM2A), a food-assisted approach to reduce the prevalence of child malnutrition. PM2A provides a package of health and nutrition interventions to all pregnant women, mothers of children 0–23 months, and children under 2 in food-insecure areas, regardless of nutritional status. PM2A interventions include providing fortified food rations (e.g., corn soya blend), requiring attendance at regular preventive health visits, and engaging patients in social and behavior change activities.^b A study in Burundi found that PM2A had a positive effect on household access to food, child feeding practices, and child morbidity.^c

a Roy, SK et al. 2005. “Intensive Nutrition Education with or without Supplementary Feeding Improves the Nutritional Status of Moderately Malnourished Children in Bangladesh.” *Journal of Health, Population and Nutrition*. 23 (4): 320–330; Dewey, KG and Seth, A. 2008. “Systematic Review of the Efficacy and Effectiveness of Complementary Feeding Interventions in Developing Countries.” *Maternal and Child Nutrition*. 4: 24–85; Bhandari, N et al. 2004. “An Educational Intervention to Promote Appropriate Complementary Feeding Practices and Physical Growth in Infants and Youth in Rural Haryana, India.” *Journal of Nutrition*. 134: 2342–2348.

b Food and Nutrition Technical Assistance II Project (FANTA). 2010. *Title II Technical Reference Materials. TRM-01: Preventing Malnutrition in Children under 2 Approach (PM2A): A Food-Assisted Approach*. Washington, DC: FHI 360/FANTA.

c Leroy, JL et al. 2016. “Tubaramure, a Food-Assisted Integrated Health and Nutrition Program in Burundi, Increases Maternal and Child Hemoglobin Concentrations and Reduces Anemia: A Theory-Based Cluster Randomized Controlled Trial.” *Journal of Nutrition*. 146 (8): 1601–1608.

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Types of specialized food products

MAM is treated most commonly on an outpatient basis. Management of MAM typically consists of treating medical complications, addressing underlying infections, counseling on the optimal use of locally available food to improve nutritional status and prevent SAM, providing supplementary food products (a type of specialized food for treatment of MAM), and monitoring health and nutritional status. If vulnerable individuals (children 6–59 months; pregnant women; lactating women with infants under 6 months; individuals with special needs, such as people with HIV or TB; and the elderly) cannot obtain adequate nutrients from locally available food, supplementary food products can be added to their diet to compensate for deficiencies in energy, protein, and micronutrients. Such food is prescribed only when specific anthropometric criteria are met and may include RUSF, FBF, or other specialized food products (see Box 2).¹⁶

¹⁶ Specialized foods refer to a group of food products used to improve an individual's nutritional status. Supplementary foods are a subcategory of specialized food products used in the management of MAM and/or the prevention of malnutrition. Therapeutic foods are a subcategory of specialized food products that are used to treat individuals with SAM.

BOX 2 SUPPLEMENTARY FOOD FOR THE MANAGEMENT OF MAM

Ready-to-use supplementary food (RUSF) typically contains oil, dried skim milk or soy protein isolate, groundnuts, sugar, a vitamin and mineral premix, and maltodextrin. RUSF brands include Plumpy'Sup, which comes in sachets.

Fortified blended food (FBF) is a blend of partially precooked cereal (wheat, corn, rice, and/or soy) that has been fortified with vitamins and minerals. FBF may also contain pulses, oil seeds, sugar, vegetable oil, and/or milk powder or whey protein concentrate. FBF is usually mixed with water and cooked as a porridge. FBF brands include Super Cereal (formerly CSB+) and Super Cereal Plus (formerly CSB++). Super Cereal does not contain milk, whereas Super Cereal Plus contains milk powder. Super Cereal Plus is typically targeted to children 6–59 months. Sorghum-pea, oat-soy, and millet-pulse blends of FBF are under development.^a

Other specialized food products include nutrient-dense drinks, bars, biscuits, or pastes. They are usually packaged in individual doses. Examples include the World Food Programme's High-Energy Biscuits (HEB) and High-Energy Bars for Integrated Management of Malnutrition (HEBI), produced in Vietnam. These types of specialized food products are designed for the management of MAM in children and to promote linear growth in children under 2.

^a World Food Programme. 2015. "[Specialized Nutritious Foods](#)." Rome: WFP.

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BOX 3 THE FOOD BY PRESCRIPTION EXPERIENCE


In 2006, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) issued guidance on food and nutrition support for people with HIV and orphans and vulnerable children (OVC). Interventions addressing nutrition outcomes of adults with HIV included the provision of therapeutic food to treat acute malnutrition as well as nutritional assessment and counseling. These interventions, commonly referred to as 'Food by Prescription' programs, were initially implemented in five African countries with PEPFAR support. The provision of specialized food products became the main focus of Food by Prescription programming, with limited attention to counseling patients on how to prevent malnutrition or maintain improved nutritional status after treatment. Recognizing the need to highlight the range of interventions to prevent malnutrition and treat it successfully, in 2009, PEPFAR began promoting the term "Nutrition Assessment, Counseling, and Support (NACS)." ([read more](#))

BOX 4 SUPPLY CHAIN MANAGEMENT OF SPECIALIZED FOOD PRODUCTS

Like other commodities for nutrition support (e.g., micronutrients and point-of-use water purification products), specialized food products have to be procured from international or local (in-country) suppliers. They need to be stored safely, under appropriate conditions, and then be transported to distribution sites, distributed to patients, and monitored.

In 2013, the World Food Programme published guidance on nutrition commodity planning, procurement, quality management, and logistics, titled [Managing the Supply Chain of Specialized Nutritious Foods](#).

Various tools have been developed to forecast quantities of specialized food products needed for NACS.

 [FAQs from SCMS about specialized food products](#)

 [UNICEF forecasting tool](#)

 [NACS product cost calculator tool](#)

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TREATMENT OF SEVERE ACUTE MALNUTRITION

Treatment of SAM involves the following:

1. Outpatient care for patients with SAM without medical complications
2. Inpatient care for patients with SAM and medical complications

Qualified health care providers should assess the nutritional status of their patients to identify individuals with SAM (see **Module 2**). Infants and children 6–59 months who have a MUAC < 115 mm, a weight-for-height/length z-score < -3, and/or presence of bilateral pitting edema should be admitted immediately to a program for the management of SAM.¹⁷ For older children, adolescents, and adults, SAM is identified by low BMI, low MUAC (under a certain cutoff), and/or the presence of bilateral pitting edema of nutritional origin. For children and adolescents 5–19 years of age, SAM is defined as a BMI-for-age z-score < -3; among adults, a BMI < 16 indicates SAM. There are no global standard MUAC cutoffs to identify SAM in older children, adolescents, and adults. Therefore, different countries use different cutoffs to determine SAM. Note, most countries also have separate cutoffs for pregnant and lactating women.

Patients who are identified as having SAM should be clinically assessed to determine whether they have medical complications and whether they have an appetite. Severely malnourished patients who pass an appetite test and do not have medical complications can start

treatment for SAM in outpatient care and continue dietary treatment in the home. Severely malnourished patients with medical complications or who fail the appetite test are admitted to a hospital for inpatient care and referred to outpatient care (if available) as soon as their medical complications have resolved, they have good appetite, and they are clinically well. Once released from inpatient care, patients should continue receiving treatment in outpatient care and at home.

Treatment of SAM with appetite and no medical complications

Patients with SAM who pass an appetite test and have no medical complications are treated in outpatient care. Trained health care providers prescribe a home ration of RUTF for a specific duration, depending on individual assessment and program design, to patients who meet strict eligibility criteria. See entry and exit criteria for the prescription of specialized food products for more information.

The client's clinical condition is monitored at the health facility, mobile clinic, or decentralized health outreach point at each follow-up visit. Patients are discharged from treatment when they meet the exit criteria. Periodic follow-up should be provided to clients to monitor nutritional status.



How to give an appetite test



Anthropometric cutoffs for select countries

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¹⁷ WHO. 2013. *Guideline: Updates on the Management of Severe Acute Malnutrition in Infants and Children*. Geneva: World Health Organization.

Treatment of SAM with medical complications and no appetite

Some severely malnourished patients may present with medical complications that require immediate admission to a health facility and treatment on an inpatient basis. Global guidelines are available for medical treatment of children under 5 with SAM, but not yet for older children, adolescents, and adults.

Although there is no global guidance for treatment of adults with SAM, Action Contre la Faim (ACF) has published guidance on addressing SAM in adults.¹⁸

Patients who need inpatient management of SAM are treated by skilled health care providers in wards or health facilities that provide 24-hour inpatient care. Therapeutic milk is provided for the stabilization phase (F-75) and the transition phase (F-100), and F-100 or RUTF is provided for the rehabilitation phase (see Box 5, on the next page, on therapeutic food and the link to entry and exit criteria for the prescription of specialized food products).

In cases where outpatient services are available, patients may be transferred to outpatient care if their medical complications have resolved, they have a good appetite, and they are clinically well. Following discharge from inpatient care, patients receive follow-up and RUTF in outpatient care and continue treatment at home. Patients continue receiving RUTF until their SAM has resolved. Then, they are transitioned to RUSF, if available, until they are discharged from treatment. Discharge from treatment occurs when patients meet the exit criteria. For patients under 5 years of age, the WHO-recommended exit criteria are: weight-for-height z-score ≥ -2 and no edema for at least 2 weeks; or MUAC ≥ 125 mm and no edema for at least 2 weeks.

If outpatient therapeutic feeding services are not available, the patient is treated in inpatient care until the SAM has resolved. Some countries refer all children under 6 months with SAM to inpatient care.



WHO Guidelines for the management of SAM in children



ACF Guidelines for the management of SAM in children



Entry and exit criteria for the prescription of specialized food products

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¹⁸ Navarro-Colorado, C. 2006. *Adult Malnutrition in Emergencies: An Overview of Diagnosis and Treatment—Field Guidelines*. France: Action Contre la Faim (ACF).

BOX 5 THERAPEUTIC FOOD

Therapeutic food is a type of energy-dense, micronutrient-fortified, specialized food that has been manufactured specifically to treat SAM.

Therapeutic milk must be used under medical supervision and is not distributed directly to patients.

F-75 was developed for phase 1 (stabilization) treatment of SAM. Low in protein, fat, and sodium and rich in carbohydrates, it contains milk powder, vegetable fat, sugar, and a mineral and vitamin complex. **Manufacturer's specifications for F-75**

F-100 was developed for phase 2 (transition and rehabilitation) treatment of SAM. F-100 contains milk powder, vegetable fat, sugar, and a vitamin and mineral complex. Its low-osmolarity formula improves nutrient absorption. **Manufacturer's specifications for F-100**

Reconstituted F-75 and F-100 can be kept for 3 hours at room temperature and up to 16 hours in a refrigerator. The packets can be used up to 24 months after the date of manufacture.

Ready-to-use therapeutic food products are energy-dense, micronutrient-fortified, and designed to accelerate weight gain. They are usually lipid based, meaning that most of the energy they provide comes from lipids. RUTF products are also called large-quantity, lipid-based nutrient supplements (LQ-LNS) because they are provided in large amounts.

Some RUTF products such as Plumpy'Nut consist of a highly fortified groundnut-based paste containing sugar, vegetable fat, skimmed milk powder, and vitamins and minerals. Each 92-g packet provides 500 Kcal. Depending on the manufacturer, RUTF can be used up to 12–24 months after the date of manufacture. RUTF is not water based, so it resists bacterial growth. It does not require refrigeration or dilution with water and can be eaten directly from the packet.

Unlike F-75 and F-100, RUTF can be provided directly to patients and used on an outpatient basis without medical supervision.

Note: For infants under 6 months, therapeutic foods are not appropriate (except under very specific circumstances). Careful management by health professionals is needed when therapeutic milks may be indicated for SAM, as described in the **WHO guidelines on the management of SAM in infants and children**. Therapeutic foods to treat or prevent moderate acute malnutrition are not appropriate for infants under 6 months.



PREVENTION AND TREATMENT OF MICRONUTRIENT DEFICIENCIES

Provision of micronutrient supplements. It is recommended that children 6–59 months of age receive vitamin A supplementation every 4–6 months and that children under 5 receive zinc for 10–14 days for any episodes of diarrhea.¹⁹ In areas where the prevalence of anemia is 20% or higher in children 2–15 years of age, WHO recommends intermittent iron supplementation to reduce the risk of anemia. In malaria-endemic areas, WHO recommends that iron supplementation be conducted in conjunction with malaria prevention and management measures.²⁰

To prevent maternal anemia, WHO recommends daily iron and folic acid supplementation for pregnant women. In areas with a prevalence of night blindness that is greater than or equal to 5%, vitamin A supplementation is recommended for pregnant women. Some studies have shown that maternal multiple micronutrient supplementation may reduce the risk of low birth weight and small size for gestational age.²¹ However, WHO currently does not recommend maternal multiple micronutrient supplementation.²²

In areas where available food does not meet micronutrient needs, individuals, including those with chronic conditions such as HIV and TB, may need micronutrient supplements prescribed based on individual dietary assessment.

Note: People who consume specialized food products, which are highly fortified, should not take micronutrient supplements, except in certain cases of identified deficiencies.

Provision of micronutrient powders (MNPs).

Complementary foods are sometimes fortified with MNPs to improve micronutrient intake in children 6–23 months of age. Single-dose packets of MNPs such as ‘Sprinkles’ can be sprinkled onto semi-solid food to provide multiple vitamins and minerals in powder form. Eight trials in Asia, Africa, and the Caribbean found an association between the use of MNPs for home fortification of complementary foods and a reduced risk of anemia and iron deficiency in children under 2 years.²³ Similar trials have been conducted among women, but WHO does not recommend the routine use of MNPs as an alternative to iron and folic acid supplements during pregnancy.²⁴

Consumption of fortified foods. Food fortification can provide needed micronutrients to populations that lack access to adequate quantities of micronutrient-rich fruits, vegetables, and other foods. One way to ensure that pregnant and lactating women, young children, and other vulnerable groups meet their micronutrient needs is through promotion and provision of foods fortified with micronutrients. Food fortification improves the nutritional content of staple foods through the addition of essential vitamins and minerals (e.g., iron, vitamin A, folic acid, iodine). Commonly fortified foods include staples such as salt, flour, sugar, vegetable oil, milk, and rice.



Guidelines for micronutrient supplementation

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19 Horton, S, Begin, F, Grieg, A, and Lakshman, A. 2009. *Best Practice Paper: Micronutrients for Child Survival (Vitamin A and Zinc)*. Copenhagen: Copenhagen Consensus Center.

20 WHO. 2016. *Intermittent Iron Supplementation in Preschool and School-Age Children in Malaria-Endemic Areas*. Geneva: WHO.

21 Kawai, K et al. 2011. *Bulletin of the World Health Organization*. 89: 402–411B; Haider, BH and Bhutta, ZH. 2015. *Cochrane Database of Systematic Reviews*. 11.

22 WHO. 2016. *WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience*. Geneva: WHO.

23 De-Regil, LM, Suchdev, PS, Vist, GE, Walleser, S, and Peña-Rosas, JP. 2013. “Home Fortification of Foods with Multiple Micronutrient Powders for Health and Nutrition in Children under Two Years of Age.” *Cochrane Database of Systematic Reviews*. 9:CD008959.

24 WHO. 2011. *Multiple Micronutrient Powders for Home (Point of Use) Fortification of Foods in Pregnant Women: A Systematic Review*. Geneva: WHO.

What are nutrition-sensitive interventions under NACS?

This section describes interventions to address underlying factors that contribute to malnutrition, including economic and food insecurity and poor hygiene and sanitation. NACS includes referral of clients from health facilities to services that can help improve health, economic and food security, and nutritional status. Such services can be provided by the health, agriculture, social protection, or rural development sectors.

WATER, SANITATION, AND HYGIENE SUPPORT

Diarrheal disease is the second leading cause of mortality and morbidity in children under 5. WHO estimates that 85–90 percent of diarrheal illnesses in developing countries can be attributed to unsafe water and inadequate sanitation and hygiene practices, including poor food hygiene.²⁵ There is a vicious cycle between diarrhea and undernutrition: people with diarrhea eat less and are less able to absorb the nutrients from food, and malnourished people are more susceptible to diarrhea when exposed to fecal material from the environment. Diarrhea affects most people living with HIV and results in significant morbidity and mortality,

especially in children.²⁶ Diarrheal illness can interfere with the absorption of antiretroviral drugs.

The following water, sanitation, and hygiene improvements (see **Module 3. Nutrition Counseling**) can reduce the incidence of diarrheal disease:

- Distributing point-of-use (POU) water treatment products or vouchers for POU water treatment and counseling on water treatment options (boiling, adding chlorine, solar disinfection, and filtering).
- Counseling on safe water storage, including keeping water in clean containers with tight-fitting lids or narrow necks and makeshift lids, storing water containers off the floor, and pouring water into cups rather than dipping cups and hands into containers.
- Providing safe water kits (a water treatment product, a water storage container, and soap) as an incentive to increase the use of health services and sustain health facility attendance.²⁷
- Distributing a basic care package including a water container, hypochlorite solution, information on handwashing, a treated bed net for malaria prevention,

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25 Prüss-Üstün A, Kay D, Fewtrell L, and Bartram J. 2004. "Chapter 16: Unsafe Water, Sanitation and Hygiene." *Comparative Quantification of Health Risks*. Volume 2. Geneva: WHO.

26 C-Change and WASHplus Projects. 2012. *Integrating Sanitation into the Basic Care Package*. Washington, DC: FHI 360.

27 Hygiene Improvement Project. 2013. *Integrating Water, Sanitation, and Hygiene Promotion into Nutrition Programming*. Washington, DC: FHI 360/The WASHplus Project.



Resources on community-led total sanitation



Water and Sanitation Program (WSP) Tanzania's Training of Trainers Manual on Hygiene and Sanitation

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and a bar of soap. This package could also include materials on how and when to wash hands, how to build a water-saving handwashing device called a tippy tap, and how to manage feces safely in the home.

- Mobilizing communities to improve sanitation and hygiene by eliminating open defecation. Community-led total sanitation is an approach that helps communities analyze open defecation issues and take action to become open defecation-free.

ECONOMIC STRENGTHENING, LIVELIHOOD, AND FOOD SECURITY (ES/L/FS) SUPPORT

The relationship between disease, economic and food insecurity, and malnutrition is well known. Illness and malnutrition reduce labor productivity and disrupt household livelihood patterns, which can reduce food access and income flow just as added health care costs simultaneously strain the household budget. In turn, food insecurity and poverty may contribute to health challenges by necessitating coping strategies such as migration for work or high-risk sexual behaviors, thereby increasing vulnerability to HIV infection and other diseases. Families and communities are the main safety nets for people with chronic illness. However, without efforts to slow down or halt their downward economic slide, the number of extremely vulnerable households can overwhelm the capacity of community safety nets.

Economic factors affect a household's ability to access sufficient quantities of food as well as the nutritional quality of the diet. As NACS clients achieve improved health as a result of clinical services, they and their households may need access to ES/L/FS support to

prevent relapse into malnutrition. Economic resilience can help sustain health outcomes by helping clients meet their food and nutrition needs without ongoing food support. Economically stable households can better afford health-related costs such as medications or transport to health facilities, thereby increasing health-seeking behaviors.

Referral linkages between NACS and ES/L/FS services

Strong linkages between health care facilities and community-based services give clients access to support to address economic barriers to adequate food access and health care. Referrals to community ES/L/FS services can help improve nutritional status and retention in clinical care. These linkages require knowledge of available support and effective referrals to and from health facilities. The following steps support the establishment of effective referral systems to link NACS clients with available ES/L/FS opportunities:

- **Conduct a situation analysis** of the community context, including health services and distances between catchment communities and health facilities.
- **Map community services** and develop a **service directory** of ES/L/FS service providers in each catchment area.
- **Hold a stakeholders meeting** for service providers and government representatives in each catchment area to share and validate the mapping results, develop priorities for improving linkages between NACS and ES/L/FS services, and decide on an action plan to develop the referral network.

- **Identify a lead community organization or entity** to lead the implementation, maintenance, and monitoring of the referral network, including managing the referral database, ensuring follow-up of referred clients, coordinating referral committee meetings, updating the service directory, working with service providers to address gaps and inefficiencies in the system, tracking referral outcomes, and ensuring the quality of the system.
- **Develop a diagnostic tool** to assess household poverty and food security in order to match clients to the most appropriate ES/L/FS support.
- **Create or adapt referral tools** (guidelines, standardized electronic or paper-based forms and registers, clear feedback mechanisms, and a referral database that tracks receipt of services, referrals to other services, and use of those services) and train network members to use these tools to facilitate systematic, effective referrals between facility-based NACS and ES/L/FS services.
- **Identify referral contact points** to track and provide feedback on referrals and bring together facility- and community-based service providers in the network to discuss the operation of the referral system and address challenges.

Provision of ES/L/FS support

Preventing the erosion of economic resources by helping households strengthen their livelihoods and build their asset base before health crises occur is as important as helping households recover from crises. ES/L/FS support for people at their most vulnerable is expensive and time consuming and has a limited chance of long-term success. In addition, explicitly targeting ES/L/FS support based on health status (e.g., HIV or tuberculosis) can exacerbate stigma and create jealousy or resentment, particularly when other people in the area also perceive themselves as deserving of this kind of support. ES/L/FS support should instead match the level of poverty and vulnerability experienced by the household, regardless of health status. There are three broad types of ES/L/FS services for different types of households—provisioning, protection, and promotion.

Provisioning activities provide temporary support to destitute households to help them recover assets, put food on the table, and meet their basic needs. These activities can also help households avoid harmful coping strategies such as reducing food consumption, engaging in high-risk behaviors, or withdrawing children from school to work or care for sick family members. Provisioning support should be carefully targeted to the most vulnerable households

BOX 6

PRACTITIONER GUIDANCE ON REFERRAL SYSTEMS AND ANALYSIS TOOLS

For more information on referral system models, elements of referral networks, and an overview of the challenges in making clinic-community referrals see: [LIFT II's Designing Effective Clinic-to-Community Referral Systems: Analysis of Best Practices to Inform LIFT Technical Assistance](#). For practitioner guidance (e.g. for project staff, implementing partners, and stakeholders) around organizational analysis mapping, situational analysis, and quality improvement, see the series of guides available on the [LIFT project's field guidance webpage](#).





LIFT II's Technical Intervention Notes: Cash Transfer and Voucher Programs



WFP's Building Resilience Through Asset Creation



National Rural Employee Guarantee Act (NREGA)

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and matched with strategies to move households upward on the pathway to more sustainable and productive types of ES/L/FS support and to reduce dependence on external support. Provisioning activities include small basic income grants, food or cash transfers, labor schemes (food-for-work or cash-for-work), and other social protection mechanisms. Two examples of provisioning activities are described below.

- **Cash transfers** aim to support basic needs. Conditional cash transfers require recipients to comply with certain conditions, such as regular school attendance or immunizing their children, while unconditional cash transfers have no such requirements. Both have resulted in positive outcomes related to poverty, health, nutrition, and education.²⁸ Some effective cash transfer programs have included nutrition counseling.
- **Labor schemes** offer cash or food as payment for work, often as part of large infrastructure projects. Examples are the WFP's food assistance for assets (FFA) program (FFA has replaced earlier food for work, cash for work, and food for recovery programs) and the National Rural Employment Guarantee Act (NREGA) in India, which provides a minimum wage to unskilled laborers who work for up to 100 days a year on public works projects.

Protection activities help vulnerable households that are struggling to make ends meet strengthen their money management skills and/or generate additional income. Examples are financial literacy training, employment programs, and improved access to legal services. Basic income-generating activities can help households supplement incomes, increase their purchasing power, and improve dietary intake and diversity. Household gardening, which is intended to improve access to nutritious food and offset its high cost, may also provide an additional source of income for households that sell their surplus.²⁹ Another protection activity involves community savings and lending. Community-led savings and lending approaches include the well-known CARE village savings and loan associations (VSLA) and Catholic Relief Services (CRS) savings and internal lending communities. These methods, which sometimes include business training and linkages to value chain opportunities, can support households that have no access to formal microfinance support.

Promotion activities are best suited for households that are ready to grow economically and can assume greater risk, such as investing capital and other resources for future gains. Interventions in this category promote diversifying into alternative income-generating activities that require little investment. While such activities offer relatively low return on investment, they do not cause



WHO's Essential Nutrition Actions: Improving Maternal, Newborn, Infant and Young Child Health and Nutrition (pp. 82–85)



Information about the VSLA approach



CRS savings and internal lending communities

28 Bhutta ZA et al. 2008. "What Works? Interventions for Maternal and Child Undernutrition and Survival." *The Lancet*. DOI:10.1016/s0140-6736(07)61693-6.

29 A 2011 review of the impact of agricultural interventions to improve child nutritional status (Masset E, Haddad L, Cornelius A, and Isaza-Castro J. 2011. A Systematic Review of Agricultural Interventions That Aim to Improve Nutritional Status of Children. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.) found that home gardens, biofortification, aquaculture, small fisheries, dairy development, and animal-source food production interventions appeared to have a positive impact on the production of promoted food items, but their impact on total household income was less clear. Food consumption, particularly calorie consumption, generally did not respond significantly to income changes. Consumers may use increased income to buy and eat more of one food item while reducing consumption of other items.

BOX 7 CREDIT FOR PEOPLE LIVING WITH HIV IN KENYA AND UGANDA

AIDS support organizations in Kenya and Uganda provided social and health services to people living with HIV, AIDS widows, and caregivers of AIDS orphans. Initially, they provided free goods and services, including grants, but the support evolved toward credit for people living with HIV and caregivers.

These initiatives had a common pattern, with loan repayment rates ranging between 65 and 86 percent. When there were no consequences for late repayment, people who had begun by paying on time began falling behind in their payments. Most program staff considered their loan capital to be a revolving fund, but in every case, the loan fund decreased by as much as 50 percent in 2 years, mainly because of repayment problems. Because staff had to divide their time among different services, they were only able to reach a small number of patients.

Building economic strengthening support into NACS services is challenging, but organizations often feel compelled to do so because of the strong demand. Over time, most organizations decide that they need a separate mechanism to offer such services to target patients. They also learn that such a mechanism has to adhere to sound practices. In the end, some social development organizations look for specialized institutions to serve patients more effectively.

Source: Donahue (Thompson) J, Kabuccho K, and Osinde S. 2001. *HIV/AIDS—Responding to a Silent Economic Crisis among Microfinance Clients*. Nairobi: Micro-Save-Africa.

households to take on undue risk. Instead, they aim to move households beyond risk-reduction strategies by linking them to opportunities for growth and helping them generate sustainable income. The most common interventions in this category promote self-employment through microenterprise development; improve employability through workforce development or vocational training; or address structural impediments to economic growth by improving market linkages, developing value chains, or enabling environmental reform.

Value chain development methodologies focus on improving production, processing, logistics, distribution, marketing, sales, and service. When targeted appropriately, they provide very poor households with opportunities for greater market engagement. The *Integrating Very Poor Producers into Value Chains Field Guide* provides tools for reaching people below nationally defined poverty lines.

Households often do not move upward linearly through the successive provisioning, protection, and promotion categories. Periodic shocks may set them back in some cases, while in others, positive experiences may propel them forward on the livelihood pathway. Therefore, service providers in a NACS referral network should be trained to understand specific client needs and provide referrals for clients across the categories. Government, the private sector, and nongovernmental, community-based, and faith-based organizations are involved in ES/L/FS activities. Referring NACS clients to appropriate activities that can improve their livelihoods and food security is part of the complete NACS package.



Integrating Very Poor Producers into Value Chains Field Guide



LIFT II's Livelihood and Food Security Conceptual Framework categorizes household services and interventions

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BOX 8**FOOD, NUTRITION, AND LIVELIHOOD SUPPORT CAN IMPROVE FOOD SECURITY AND NUTRITION OUTCOMES FOR PEOPLE WITH HIV**

A review of the evidence on how to address the food security and nutrition dimensions of HIV found that nutrition supplementation, food assistance, and livelihood interventions can improve food security and nutrition outcomes for people living with HIV.^a HIV precipitates and exacerbates food insecurity and undernutrition, and wasting and underweight are strong risk factors for mortality, even among people on ART. Coping behaviors to mitigate food insecurity can increase the risk of HIV transmission. Research in 2010 by the AIDS Service Organization in Uganda and the Regional Network on AIDS, Livelihoods, and Food Security, coordinated by the International Food Policy Research Institute, found that household food security and individual dietary quality—a proxy for nutritional adequacy—independently predicted underweight, wasting, and quality of life among people with HIV. The researchers also found that poor dietary quality was associated with disease severity, as measured by CD4 count, moderate anemia, and mortality.^b Preliminary evidence suggested a positive association between food assistance and weight gain, but further research is needed to determine whether improved nutritional status can influence disease progression.

- a Aberman NL et al. 2014. "Food Security and Nutrition Interventions in Response to the AIDS Epidemic: Assessing Global Action and Evidence." *AIDS and Behavior*. 18 (Suppl 5): S554–65.
- b Rawat R et al. 2010. "The Impact of Food Assistance on Weight Gain and Disease Progression among HIV-Infected Individuals Accessing AIDS Care and Treatment Services in Uganda." *BMC Public Health*. 10: 316.



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