



THE WORLD BANK

HIV/AIDS, NUTRITION, AND FOOD SECURITY: WHAT WE CAN DO

A SYNTHESIS OF INTERNATIONAL GUIDANCE



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PREFACE

HIV and AIDS are having a devastating effect in Sub-Saharan Africa. Of the 10.8 million deaths estimated to have occurred in the year 2000, HIV caused over 20 percent of them (Jamison et al. 2006). The annual toll of AIDS deaths in Sub-Saharan Africa continues to grow, despite progress in some countries. While mortality rates have been reduced through prevention interventions, counseling, testing, support, and treatment, the potential for nutrition to contribute to a decline in HIV- and AIDS-related morbidity and mortality has neither kept pace nor lived up to its potential.

In the past several years an increasing body of evidence has demonstrated the links between malnutrition, HIV, and AIDS and the cumulative effect they have on economic growth. There is little debate as to the integral role that nutrition plays in HIV prevention, treatment, and mitigation or to its importance in caring for HIV-positive individuals, affected households, and communities.

Since 2000 the World Bank has financed 34 HIV/AIDS projects, including five sub-regional projects, with commitments in excess of US\$1.3 billion. The approach has been to provide assistance for prevention, care and support, treatment, and capacity building, with a large portion of the resources channeled through civil society organizations (with more than 50,000 such interventions). Additionally, through the Poverty Reduction Strategy process and debt-forgiveness, resources are being mainstreamed to continue the fight against HIV and AIDS. As the Bank's program has evolved, and with increased knowledge about the importance of nutrition to effective responses to HIV and AIDS, the Bank has recognized the need to better understand how to integrate nutrition into programs for HIV and AIDS (and how to integrate considerations about HIV and AIDS into nutrition programs).

Many organizations have produced excellent state-of-the art papers and guidelines on different technical aspects of nutrition responses to HIV and AIDS, but the materials have not necessarily found their way into the work and resource allocations of national HIV and AIDS commissions or secretariats or other national partners, in the public sector or elsewhere. Moreover, many of these materials do not focus exclusively on the nutritionally relevant aspects of prevention and treatment of HIV and AIDS. Information has been somewhat scattered across and within various documents. Thus a synthesis of existing technical guidance on HIV and AIDS, nutrition, and food security was seen as a valuable contribution to efforts to integrate nutrition projects and programs for HIV and AIDS.

With funding from the Bank-Netherlands Partnership Program (BNPP), the World Bank initiated a wide consultative process to produce such a synthesis, to collate and summarize existing technical knowledge and guidance at global and regional levels. The synthesis aims to provide decisionmakers and service providers, especially those who design and manage programs, with guidance on how nutrition may be integrated into HIV prevention and AIDS treatment. A main purpose of the synthesis is to provide guidance to national AIDS programs in Sub-Saharan Africa (especially those supported through the World Bank Multi-Country HIV/AIDS Program, or MAP, projects). Therefore, the document was developed and field-tested for use in the Africa region. However, most of the recommendations draw on international guidelines and should also be applicable in other HIV-affected regions in the world where public resources are constrained.

The initial draft synthesis was reviewed and discussed in August 2006 at a consultative meeting involving a broad range of UN, bilateral, research, and non-governmental organizations. Participants at the consultation agreed that the synthesis, once finalized, should be widely disseminated as a generic guide and not restricted to World Bank programs.

The synthesis draws from available international guidelines and other related documents prepared by AED/FANTA, FAO, IFPRI, PATH, UNAIDS, UNHCR, UNICEF, USAID, WFP and WHO. For those topics on which there were limited or no official international guidelines, the document also refers to guidance from other national and international organizations (see Annex I). The nutrition and HIV/AIDS community provided helpful comments and inputs throughout, in particular AED/FANTA, IFPRI, PATH, SARA, UNAIDS, UNICEF, USAID, WFP, and WHO.

This synthesis is an output of the first phase of a two-part effort funded by BNPP, the "Integration of Nutrition into HIV/AIDS Programs: Strengthening Operational Capacity in Eastern and Southern Africa." In the second phase, the Bank and its partners are adapting this global guidance to focus on operational aspects in specific country contexts. Currently the Bank is piloting adaptation and dissemination activities of the synthesis in two African countries, Mozambique and the Republic of Congo.

We hope the resulting technical guidance helps generate a one-stop resource document for program managers and decisionmakers in Sub-Saharan Africa and elsewhere. Still, we recognize more has to be done. For example, the document does not fully differentiate between situations with generalized epidemics and those where epidemics are highly concentrated. Policymakers would probably like to have more information on cultural considerations, institutional constraints, and use of appropriate policy frameworks. They would like to know more about how to put recommendations and protocols into practice and about the cost and effectiveness of various program options. This would include additional information on operations and implementation, including implications for staffing, training, management, supply needs, and associated costs. We envision this as a future effort, with experiences from Mozambique, the Republic of Congo, and other countries a first step.

Furthermore, given the dynamics of HIV and AIDS and nutrition, new knowledge arises regularly, and recommendations are being reviewed constantly as new knowledge emerges. Thus this synthesis is a "living document" on which to build as more is learned. Our goal is to distribute this guide widely, and gauge its usefulness. Please share your experiences in using this tool, and let us know how it might be improved. You may send comments to individual partner organizations or to the World Bank, at nutrition@worldbank.org.

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ACRONYMS & ABBREVIATIONS

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AED	Academy for Educational Development
AFASS	acceptable, feasible, affordable, sustainable, and safe
AIDS	Acquired Immune Deficiency Syndrome
ANC	antenatal care
ART	antiretroviral therapy
ARV	antiretroviral drug
AZT	azidothymidine or zidovudine (ZDV)
BMI	body mass index
d	day
EFV	efavirenz
FANTA	Food and Nutrition Technical Assistance Project
FAO	Food and Agriculture Organization of the United Nations
HIV	Human Immunodeficiency Virus
IASC	Inter-Agency Standing Committee
IBFAN	International Baby Food Action Network
IFPRI	International Food Policy Research Institute
IMCI	Integrated Management of Childhood Illness
IYCN	Infant and Young Child Nutrition Project
IU	international units
Kcal	kilocalorie
LBW	low birth weight
MTCT	mother-to-child transmission
MUAC	mid-upper arm circumference
NCHS	National Center for Health Statistics
OVC	orphans and vulnerable children
PAHO	Pan-American Health Organization
PATH	Program for Appropriate Technologies in Health
PCR	polymerase chain reaction
PEM	protein-energy malnutrition
PEPFAR	President's Emergency Plan for AIDS Relief
PLHIV	person living with HIV
PLWHA	person living with HIV/AIDS
PMTCT	prevention of mother-to-child transmission
RDA	recommended dietary allowances
RENEWAL	Regional Network on AIDS, Livelihoods, and Food Security
SARA	Support for Analysis and Research in Africa
TB	tuberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
USAID	US Agency for International Development
VCT	voluntary counseling and testing
WFP	World Food Programme
WHO	World Health Organization

Please see Glossary for definitions of additional terms.

I. IMPROVING HIV AND AIDS OUTCOMES THROUGH NUTRITION SUPPORT

Evidence has shown important links between improved HIV and AIDS outcomes and nutrition. Adequate nutrition is necessary to maintain the immune system, manage opportunistic infections, optimize response to medical treatment, sustain healthy levels of physical activity, and support optimal quality of life for a person living with HIV (PLHIV). Good nutrition may contribute to slowing the progression of the disease (Castleman et al. 2004). Nutrition interventions can also help to optimize the benefits of antiretroviral drugs (ARVs) and may increase compliance with treatment regimens, both of which are essential to prolonging the lives of PLHIVs and to preventing the transmission of HIV from mother to child.

Nutrition counseling has been shown to be effective in improving body weight and body cell mass in PLHIVs (Dowling et al. 1990; McKinley et al. 1994; Rabeneck et al. 1998). It has also been shown to help mitigate the effects of HIV- and AIDS-related symptoms such as diarrhea, nausea, vomiting, anemia, oral thrush, loss of appetite, and fever (FANTA 2004).

For HIV-positive women, optimal nutrition during pregnancy increases weight gain and improves maternal nutrition which, in turn, improves birth outcomes. For HIV-exposed infants, adequate nutrition counseling and support can lower the risk of HIV transmission from mother to child and increase HIV-free survival of infants (WHO 2005a). For HIV-positive children, safe feeding practices and improved dietary intake are critical to regain weight lost during opportunistic infections. Periodic vitamin A supplementation in HIV-positive children reduces illness and death and improves growth (Piwoz 2004a).

The broader relationships and interactions between HIV, AIDS, food security, and nutrition are complex. Food insecurity and poverty may lead to high-risk sexual behaviors and migration, increasing the risk of acquiring HIV. At the same time, HIV weakens a household's ability to provide for basic needs. When a PLHIV cannot work, food production or earnings may decrease. Healthy family members may need to stop work to care for sick family members. Household labor constraints can lead to reductions in cultivated land, shifts in crops, and depletion of livestock. For households that are food insecure prior to a member's falling ill, the effects can be devastating. As the epidemic progresses in highly affected areas, communities are weakened as traditional safety nets are stretched (Gillespie and Kadiyala 2005; Piwoz 2004a). Postponing interventions until PLHIVs or their families become malnourished or food insecure can be counterproductive and costly. Thus, maintaining adequate nutrition and food security can be instrumental in mitigating the impact of HIV and caring for PLHIVs, their affected households, and communities (World Bank 2006).

Nutritional concerns should therefore be taken into account in the preparation of HIV and AIDS strategies and action plans at national and sub-national levels. These plans should be evidence-based, with actions and interventions that are prioritized and costed. The choice of the appropriate nutrition response will be country-specific. Within a given country, that response will be determined by the nature of the epidemic, the extent to which necessary policies are already in place, and the human, institutional, and financial capacities of stakeholders. It will also depend on the extent to which those knowledgeable about the linkages between HIV, AIDS, and nutrition articulate this nexus to decisionmakers at all levels.

II. TREATMENT, CARE, AND SUPPORT

A. NUTRITION SUPPORT FOR ADULTS LIVING WITH HIV (PLHIVS)

GOAL: The goal of nutrition support for PLHIVs *not yet in need of ART* is to improve their overall health and nutritional status, prevent malnutrition, and support recovery from opportunistic infections.

The goal of nutrition support for PLHIVs *in need of ART* is to stabilize nutritional status prior to and during treatment, help people regain strength, and contribute to improving nutritional status during treatment. In places where food insecurity prevents people from accessing or adhering to treatment regimes, food support can play an important role in increasing uptake and adherence to treatment (Megazzini et al. 2006).

A.1. Nutrient Requirements

To prevent weight loss or maintain weight, fight infection, and build and maintain muscle mass, it is important to have sufficient nutrient intake at all times. PLHIVs need a diet that provides all the essential nutrients to meet increased nutritional needs.

ENERGY REQUIREMENTS: PLHIVs have additional energy requirements due to HIV, opportunistic infections, nutrient malabsorption, and altered metabolism. Energy needs depend on whether the PLHIV is symptomatic (e.g., fever, wasting, diarrhea, weight loss) or asymptomatic.

- When asymptomatic (WHO stage 1), HIV-positive adults need to increase energy intake by 10 percent over the level of energy intake recommended for healthy non-HIV-infected persons of the same age, sex, and physical activity level (FANTA 2004; WHO 2003a).
- In the presence of symptoms (WHO stage 2 and above), HIV-positive adults need to increase energy intake by 20 to 30 percent over the level of energy intake recommended for healthy non-HIV-infected persons of the same age, sex, and physical activity level (WHO 2003a).

PROTEIN REQUIREMENTS:

- Evidence suggests that HIV-positive persons require the same level of protein as healthy non-HIV-infected persons of the same age, sex, and physical activity level, although few studies of protein requirements have been done. The recommended protein intake for a healthy non-HIV-infected adult is 12 to 15 percent of total energy needs, or 0.8g/kg body weight for females and 0.85g/kg body weight for males (WHO 2003a).
- HIV-positive people often have pre-existing protein-energy malnutrition (PEM) resulting from inadequate intake or poor utilization of food and energy (FANTA 2004). Nutrition support programs may need to address this by encouraging increases in food consumption to meet recommended intakes.

“Adequate nutrition, which is best achieved through consumption of a balanced healthy diet, is vital for health and survival for all individuals regardless of HIV status.”

Nutrient Requirements for People Living with HIV/AIDS: Report of a technical consultation. WHO, Geneva, Switzerland, May 13-15, 2003.

“Adequate nutrition cannot cure HIV infection, but it is essential to maintain the immune system and sustain physical activity, and to achieve optimal quality of life.”

Participants’ Statement, WHO Consultation on Nutrition and HIV/AIDS in Africa, Durban, South Africa, April 10-13, 2005.

FAT REQUIREMENTS:

- The recommended fat intake for an HIV-positive person is the same as for a healthy non-HIV-infected person, i.e., 30–35 percent of total energy needs (WHO 2003a).
- For PLHIVs, certain ARVs, or infection symptoms such as diarrhea, may require changes in the timing or quantity of fat intake.

“Micronutrient intakes at daily recommended levels need to be assured in HIV-infected adults and children through consumption of diversified diets, fortified foods, and micronutrient supplements as needed.”

Participants’ Statement, WHO Consultation on Nutrition and HIV/AIDS in Africa, Durban, South Africa, April 10-13, 2005.

“A complete baseline nutrition assessment should be performed as part of the multidisciplinary care plan development, with regular follow up as indicated.”

Position of the American Dietetic Association and Dietitians of Canada: Nutrition Intervention with Human Immunodeficiency Virus Infection, J Am Diet Assoc., 2004.

MICRONUTRIENT REQUIREMENTS: Micronutrient deficiencies are common in areas where HIV is prevalent. PLHIVs often suffer from micronutrient deficiencies, which potentially compromise their immune function and, in turn, their ability to fight infection (FANTA 2004).

- To ensure micronutrient intakes at daily recommended levels, HIV-positive adults are encouraged to consume adequate diets (WHO 2003a).
- Diet alone may not be sufficient to correct nutritional deficiencies. If a PLHIV has signs of a micronutrient deficiency, it should be treated according to standard protocols (FANTA 2004). Recent evidence suggests that a PLHIV with multiple nutrient deficiencies may require more than one recommended dietary allowance (RDA) per day to reverse these deficiencies (WHO 2004).

There is conflicting evidence regarding the relationships between high-dose micronutrient supplements and disease progression and mortality for PLHIVs. The research currently underway will provide further guidance on micronutrient supplementation and on the therapeutic and preventive use of multivitamins (WHO 2003a).

A.2. Nutritional Assessment¹

Initial nutritional screening and assessment gathers information on the current nutritional status of PLHIVs, the adequacy of their diet, their food habits, and their dietary constraints. Screening and assessment can identify poor eating behaviors and ways to improve the diet. In addition, nutritional assessment provides the basis for appropriate counseling and decision making about the need for interventions such as food support.

Nutritional screening and assessment includes a baseline physical exam to identify any conditions requiring treatment that may affect nutritional status. Anthropometric measurements, i.e., measurement of body size, such as weight and height, can be used to calculate BMI (body mass index). BMI can be used to assess nutritional status (underweight, normal, or overweight) and any changes over time.² The use of mid-upper arm circumference (MUAC) is recommended for measuring nutritional status in pregnant women (see Section II. B.2) and may also be considered when scales and height-measuring equipment are not available.

1. This section is based on Fields-Gardner and Fergusson 2004; WHO 2004; WHO 2006a; Zambia 2004.

2. While those working in nutrition recognize the value of using BMI for nutritional assessment, it is not yet widely used in HIV and AIDS programs.

A nutritional screening and assessment should:

- Evaluate current diet, eating patterns, oral health, and other factors influencing food intake. This involves assessing individual- and household-level food security, in particular the constraints to food access and consumption.
- For women of reproductive age, consider reproductive status (pregnant, lactating, pregnant and lactating, non-pregnant non-lactating) since nutritional requirements differ for these groups.
- Evaluate the PLHIV's support system (friends, family, and support groups).
- Review the PLHIV's lifestyle practices, such as smoking, alcohol, and drug abuse, as they may influence food and nutrient intake and are contraindicated with some medications.
- Assess the living environment of the PLHIV, including the cleanliness and sanitation of the PLHIV's living area, food hygiene, and the use of safe and clean water.
- Find out what medications, nutritional supplements, and traditional therapies the PLHIV currently uses.
- Conduct laboratory tests to confirm HIV-infection status; measure hemoglobin and CD4 counts where possible; and screen for tuberculosis and malaria, with diagnostic testing for other coinfections and opportunistic diseases where clinically indicated. Test for pregnancy in women if initiation of efavirenz (EFV) is being considered.
- Take measurements regularly to adequately assess and monitor body weight. Loss of body weight is an early indicator of health and social problems and should necessitate further follow-up care.

“Dietary and nutritional assessment is an essential part of comprehensive HIV care both before and during ARV treatment.”

Participants' Statement, WHO Consultation on Nutrition and HIV/AIDS in Africa, Durban, South Africa, April 10-13, 2005.

A.3. Dietary Recommendations and Care Practices³

A diverse and balanced diet, rich in macro- and micronutrients, plays an important role in maintaining a healthy lifestyle and body. A nutritious diet can help maintain the proper functioning of the immune system and provide the energy, protein, and micronutrients needed during all stages of HIV infection.

Dietary management of HIV- and AIDS-related symptoms can prevent malnutrition and improve the overall health and nutritional status of PLHIVs. Good food and dietary practices can decrease the effects of AIDS-related symptoms on food intake and nutrient absorption, improve comfort while eating, and prevent dehydration due to diarrhea and fever. In addition, they can help maintain body weight, provide nutrients to compensate for losses, and strengthen the immune system. They can also help manage certain symptoms, such as nausea and constipation, and reduce the severity of symptoms by providing specific nutrient needs (FANTA 2004).

3. This section is based on FANTA 2004; FAO and WHO 2002.

“A broad consensus emerged from the Durban conference on the need to keep the focus on three overlapping and interacting sets of problems: HIV/AIDS, food insecurity, and malnutrition. Interactions between these problems may require certain modifications to interventions, to maximize their effectiveness in the context of HIV/AIDS.”

Gillespie, S (ed) 2006. *Highlights of the IFPRI Conference on HIV/AIDS and Food and Nutrition Security, Durban, 14-16 April 2005.*

PLHIVs should eat a balanced and diverse diet with foods in sufficient quantities to meet their energy, protein, and micronutrient needs. Annexes II and IV contain dietary recommendations and care practices for symptoms and illnesses associated with HIV in adults. Country-specific nutrition guidelines and food group recommendations for adults should be developed to provide more detailed dietary guidance.

GENERAL DIETARY RECOMMENDATIONS:

- Optimally, PLHIVs should consume a balanced and diverse diet, including staple foods, cooked legumes, nuts and nut butters, animal foods, milk products, fats and oils, and fruits and vegetables.
- As in the general population, PLHIVs should consume 30 to 35 percent of total energy in the form of fats or oils, particularly oils from vegetables and fish that provide omega-3 fatty acids. PLHIVs with fat malabsorption and those on ARV drugs that show evidence of metabolic abnormalities (e.g., high blood triglycerides) may need to consume less energy from fats.
- Particularly in settings where access to a diverse diet is limited, diets should include micronutrient-fortified foods as a way of meeting micronutrient requirements, including those for iodine, iron, and vitamin A.
- Individuals should maintain adequate hydration with at least eight cups of safe, clean water a day.

To meet their increased energy needs and avoid weight loss, PLHIVs need to:

- Increase the amount and variety of foods they eat.
- Eat more often throughout the day, having small, frequent meals and snacks.
- Eat more nutrient-dense foods with each meal.

A.4. ART and Other Medications⁴

Antiretroviral therapy (ART) based on combinations of antiretroviral drugs is prescribed to PLHIVs with immune suppression, signs and symptoms of AIDS based on clinical staging criteria, or both. These drugs suppress viral replication, allowing the immune system to restore itself and helping to slow HIV disease progression.

Whenever possible, patients who are not yet eligible for ART should be monitored for clinical progression and by CD4 count measurement every six months or more often, if clinically indicated (WHO 2006a). Clinical evaluation should include the same parameters as in baseline evaluations, including weight gain or loss and development of clinical signs and symptoms of

4. This section is based on Castleman et al. 2004; FANTA 2004; WHO 2004.

progressive HIV disease. These clinical parameters and the CD4 cell count should be used to update the WHO disease stage at each visit and to determine whether patients have become eligible for co-trimoxazole prophylaxis or ART (WHO 2006a).

Food may help or interfere with ARV uptake, affecting absorption and effectiveness. Therefore, it is important to know when to take the drugs, whether to take them with or without food, and to be cautious with meal components. Some drugs have side effects, such as nausea, vomiting, and diarrhea, which can affect food intake. Initiating ARV treatment may also be accompanied by an increase in appetite, as patients begin to feel better. All of these conditions have implications for PLHIVs. Thus, counseling to support appropriate nutrition actions plays a critical role in the safety and efficacy of ARVs and other medications commonly taken by PLHIVs.

- Nutrition counseling is recommended (with regular follow-up) to provide information on whether drugs should be taken with or without food, and to monitor changes in nutritional status and body composition after treatment is initiated (FANTA 2004).
- Health education in managing the common side effects of ARVs and other medications is advised.
- If metabolic abnormalities are detected and are minimal, nutrition counseling is also necessary to minimize the consequences and improve treatment outcomes and patient well-being. If metabolic abnormalities are significant, the patient should be referred.

A.5. Management of Wasting and Severe Malnutrition

PLHIVs are at greater risk for malnutrition than non-HIV-infected adults. At present, however, there are no specific guidelines for management of severe malnutrition in HIV-positive adults, and thus recommendations for management of severe malnutrition in the general adult population apply to those living with HIV (WHO 1999).

WHO (2004) provides the following advice for HIV-positive women:

- Refer for consideration of commencement of ARV treatment.
- Refer for additional care, including those programs that can provide screening for food security and food assistance support, when needed.
- Advise on the potential role of physical activity in increasing strength and muscle mass.

A.6. Provision of Food Supplements for PLHIVs

As adequate food and micronutrient intake contribute to improved nutritional status, treatment and support programs often provide food supplements according to defined protocols. Most of these involve providing food to people based on socio-economic or biological criteria, or both. PLHIVs that do not have sufficient food intake due to food insecurity should be provided

food supplements to help cover their deficit (Piwoz 2004a; Uganda 2003; WFP 2004). Such support should be linked to nutritional assessments. Therapeutic feeding in particular can play a vital role in stabilizing patients prior to and during ART; however, programs should take into account the possibility that rations destined for individual clients may end up being shared with other household members. For this reason, in many situations, household rations can be an important strategy for supporting the needs of particularly vulnerable families.

“Nutrition counseling can improve health outcomes and is an integral part of HIV care at any stage of the disease, from helping newly infected people to stay healthy to assisting people taking ARVs to manage their therapy, to allowing people with end-stage AIDS to die with dignity.”

Position of the American Dietetic Association and Dietitians of Canada: Nutrition Intervention with Human Immunodeficiency Virus Infection, *J Am Diet Assoc.*, 2004.

Programs have developed various rations for PLHIVs using available commodities. To address nutritional risks, often the foods provided are fortified with micronutrients or are more nutrient dense than available staple foods. Programmatic objectives, and potential opportunities and limitations (such as the fact that food support is not provided indefinitely), as well as information on clients’ diet deficiencies, food habits, relative costs, and patterns of food security should inform the development of appropriate actions.

A.7. Nutrition, Food, and Health Education and Counseling⁵

To manage AIDS-related symptoms and improve diets, nutrition, and health education and counseling should form an integral component of PLHIV treatment, care, and support. Nutrition counseling should be incorporated into treatment protocols.

Nutrition counseling and support should engage clients in dialogue about food and dietary constraints, practices, and preferences, and utilize the understanding gained to help PLHIVs improve their diet.

Counseling and support should provide information on:

- Dietary recommendations. It is also advised to conduct a session with the client that translates the recommendations into a daily or weekly meal/snack plan involving local foods, sufficient water consumption, and macro- and micronutrient supplements as needed (see also Section II. A.3).
- Drug-nutrient interactions for any currently prescribed medications and how to manage them (see Annex III for specific information on drug-nutrient interactions).
- Management of oral and digestive tract problems and other related symptoms that may affect the consumption or utilization of food (see Annexes II and IV).
- Traditional therapies, as needed. Traditional approaches are not well documented. Their nutritional effects and how they interact with drugs are mostly unknown. In addition, the evidence of their efficacy is limited, and some have unpleasant side effects (see Annex IV for some traditional ways of dealing with common illnesses and symptoms of AIDS).

5. This section is based on FANTA 2004; Fields-Gardner and Fergusson 2004; Uganda 2003; Zambia 2004.

If lack of food or micronutrients has been identified as a problem, referral to programs that provide food, micronutrients, training, or other appropriate assistance may be needed. Periodic follow-up on specific identified issues and ongoing counseling are advised.

A.8. Healthy Lifestyle Education and Counseling⁶

Healthy lifestyle education can help prevent infections and improve the quality of life for PLHIVs. Education should include information on:

- Hygiene, such as food and water safety, sanitation, and personal hygiene (see Annex V for a list of potential topics).
- Lifestyle habits, such as smoking, alcohol, and drug abuse, and their detrimental effects on food intake, absorption, and use.
- The importance and promotion of adequate amounts of physical activity as it maintains muscle mass, stimulates appetite, and enhances the feeling of well-being. Individuals who are very or overly active may need to reduce their level of physical activity.
- The importance of adequate sleep and extra rest.
- The importance and promotion of safe sex practices in order to avoid transmitting HIV to others and to prevent reinfection.
- Psychosocial support as it decreases depression, stigma, and stress, and improves quality of life, often with positive impacts on appetite and nutritional intake.
- The recognition and prompt treatment of illnesses, as well as identification of appropriate and accessible sources of care. Since PLHIVs often become sick, with illnesses affecting food intake and nutritional status, any illness should be treated quickly.

6. This section is based on FAO and WHO 2002; Uganda 2003; Zambia 2004.

B. NUTRITION SUPPORT FOR HIV-POSITIVE PREGNANT AND LACTATING WOMEN

GOAL: To preserve maternal nutritional status and improve birth outcomes through the provision of quality nutrition care and support to HIV-positive pregnant and lactating mothers and to increase HIV-free survival rates of infants.

Providing appropriate nutrition support to HIV-positive pregnant women is contingent on women knowing their HIV status which, in turn, depends on increasing access to voluntary counseling and testing (VCT) services among the general population and, specifically, pregnant and lactating women.

B.1. Nutrient Requirements

ENERGY REQUIREMENTS: No data currently exist on the impact of HIV and AIDS on energy needs during pregnancy and lactation. Thus, the recommended increased energy intake for HIV-positive adults according to disease stage should be added to the pregnant woman's average daily energy intake. During the asymptomatic phase, an HIV-positive woman requires an additional 10 percent of energy intake per day as compared with a non-HIV-infected woman, and an additional 20 percent and 30 percent during early symptomatic and symptomatic phases, respectively (see Table 1).

For example, a non-HIV-infected, moderately active 28-year-old woman who is not pregnant or lactating requires 2140 kcal/day. She should receive an additional 285 kcal/day if she is pregnant and 500 kcal/day more if lactating (FANTA 2004). When this woman is HIV-positive her needs increase accordingly, so that, for example, an HIV-positive woman in the symptomatic stage who is lactating should receive 1,142 kcal/day more than a woman who is not infected with HIV, pregnant, or lactating.

TABLE 1. *Estimated Changes in the Daily Energy Intakes of a 28-Year-Old, Moderately Active, HIV-Positive Woman and a Non-HIV-Infected Woman, By Disease Stage and Lifecycle⁷*

Non-infected or stage of the disease	Recommended daily energy intake for moderately active* adult women (kcal)	Additional energy due to HIV** (kcal)	Additional daily energy required by pregnancy (kcal)	Total (kcal) with pregnancy	Additional daily energy required by lactation (kcal)	Total (kcal) with lactation
Non-infected	2140	—	+ 285	2425	+ 500	2640
HIV-positive Asymptomatic	2140	+ 214	+ 285	2639	+ 500	2854
HIV-positive Early Symptomatic	2140	+ 428	+ 285	2853	+ 500	3068
HIV-positive Symptomatic	2140	+ 642	+ 285	3067	+ 500	3282

* Daily energy intake for a 28-year-old moderately active woman: Multiply Basal Metabolic Rate (BMR) by adjustment factor for the activity level = $1305 \times 1.64 = 2140$ kcal

** 10 percent daily energy intake increase during the asymptomatic phase = $2140 \times .10 = 214$; 20 percent daily energy intake increase at the early symptomatic phase = $2140 \times .20 = 428$; and 30 percent daily energy intake increase during the symptomatic phase = $2140 \times .30 = 642$.

7. Table 1 adapted from FANTA 2004. This is an example only and those with symptomatic infection may have a lower activity level.

PROTEIN REQUIREMENTS:

- Protein requirements during pregnancy are the same for HIV-positive women as for non-infected women. Pregnant women require 1.1 g/kg per day as opposed to 0.8g/kg per day for non-pregnant women (FANTA 2004).

MICRONUTRIENT REQUIREMENTS:**IRON**

Anemia is common among all pregnant women, and iron deficiency is often a cause. Among HIV-positive pregnant women, anemia is more pervasive and often more severe than in non-HIV-infected women. Severe anemia increases the risk for pre-term delivery, low birth weight infants, and maternal mortality. In HIV-positive women, anemia is an independent predictor of more rapid HIV progression and mortality (WHO 2004). To address the problem of iron deficiency anemia, most governments have adopted a protocol for iron and folic acid supplementation for all pregnant women that should be followed.

- WHO currently recommends daily iron and folic acid supplementation (400ug folate and 60 mg iron) for at least six months of pregnancy to prevent anemia, and twice daily supplements in order to treat severe anemia (hemoglobin < 70 g/l) (WHO 2003a; WHO 2004).
- To improve iron intake and enhance absorption, increase foods rich in bio-available iron, such as meat, or consumption of vitamin C-rich foods together with non-meat sources of iron.

VITAMIN A

Pregnant women in developing countries often suffer from vitamin A deficiency, which may negatively affect the content of breast milk and, in turn, infant stores. In most countries, governments have protocols for supplementing postpartum women and infants. For HIV-positive women, well-designed randomized control trials have shown that daily as well as single high-dose vitamin A supplementation does not reduce MTCT and that, in some situations, it may increase the risk of HIV transmission. Thus, the daily vitamin A intake during pregnancy and lactation should not exceed the RDA.

- Encourage the consumption of vitamin A-rich foods during pregnancy.

IODINE

Iodine deficiency has been linked to miscarriage, stillbirths, lower IQ, and cretinism in infants in non-HIV-infected populations. To address this, governments have protocols on the universal consumption of iodized salt.

- Pregnant women with HIV, like the general population, should be encouraged to consume iodine-fortified salt (FANTA 2004). If iodized salt is not available, pregnant women should be provided iodized oil supplements.

“Studies have shown that some micronutrient supplements may prevent adverse pregnancy outcomes... HIV infected pregnant women experience more frequent micronutrient deficiencies.”

Participants' Statement, WHO Consultation on Nutrition and HIV/AIDS in Africa, Durban, South Africa, April 10-13, 2005.

OTHER MICRONUTRIENTS

- Encourage eating a balanced and varied diet, including local fruits and vegetables, animal products, staples, and fortified foods whenever available, feasible, and affordable.
- When consuming an adequate diet is not possible or in areas where multiple micronutrient deficiencies are common, provide a daily supplement to HIV-positive pregnant and lactating women, as it may improve maternal nutritional status and birth outcomes (WHO 2004).

HIV-POSITIVE PREGNANT WOMEN WITH INCREASED NUTRIENT REQUIREMENTS: Adolescents, underweight women, women with inadequate weight gain during pregnancy, and women performing physically demanding work all have higher nutrient and energy requirements than other women during pregnancy, in addition to the increased energy needs associated with HIV. Nutrition counseling and support should consider these additional nutritional requirements.

LACTATION ENERGY, PROTEIN, AND MICRONUTRIENT REQUIREMENTS:⁸

- Lactation energy and protein requirements for HIV-positive women are the same as for healthy non-infected women. Lactation requires an additional 500 calories per day and 1.1 grams of protein per kg of maternal weight per day (as opposed to 0.8 g/kg for non-lactating women).
- Lactation micronutrient requirements for HIV-positive women are the same as for healthy non-infected women, with lactation micronutrient requirements increased due to the transfer to breast milk. Nutrition counseling should promote eating a variety of fruits, vegetables, and animal products, including dairy foods.
- Where vitamin A deficiency is endemic, WHO recommends a single high dose of vitamin A (200,000 IU) for women as soon as possible after delivery and not later than 6-8 weeks after delivery (WHO 2003a).

B.2. Nutritional Assessment⁹

In order to gather information about her current nutritional status, diet, and eating habits, a baseline nutritional and dietary assessment should be conducted when a woman is first seen during pregnancy and during postpartum follow-up. The objective of these assessments, in addition to gathering information regarding her current nutritional status and trends, is to identify risk factors for developing future nutritional complications (see Section II. A.2 for information on what data should be included in a nutritional assessment).

What follows are modified or additional recommendations that pertain to pregnant and lactating HIV-positive women.

- For pre-pregnant, postpartum, and lactating women, measure height and weight so that Body Mass Index (BMI) can be calculated and maternal nutritional status determined. However, for pregnant women, MUAC screening is recommended. Height measurements

8. This section is based on FANTA 2004; WHO 2004.

9. This section is based on WHO 2004.

can be used to determine short stature (<145 cm) as it is a risk factor for obstetric complications (WHO 1995).

- Weigh pregnant women at each antenatal visit and record their weight on an antenatal card. This information is used to determine if the pregnant woman is gaining sufficient weight. Insufficient weight gain is associated with low birth weight (LBW) and small-for-gestational-age infants.
- For women with normal weight prior to pregnancy, a weight gain of 12.5 kg during pregnancy is recommended; however, for underweight pre-pregnant women (BMI < 19.8), a higher weight gain is advised. The recommended weekly weight gain during the second and third trimesters of pregnancy is 0.3 to 0.5 kg (FANTA 2004). A weight gain of 1 kg per month or less in the last two trimesters of pregnancy is cause for serious concern and action (see Annex VI for a chart that includes the recommended total and weekly weight gain during pregnancy by pre-pregnancy BMI).
- If poor gestational weight gain or loss occurs, the woman should be screened for underlying diseases. A dietary and nutritional assessment should also be carried out to identify other possible causes and develop an action plan with the woman to improve her weight gain. Family members or additional outside assistance (food supplementation, community or household support) may need to be enlisted to ensure successful treatment and follow-up. A follow-up schedule should be established and respected to ensure that the action plan is followed and weight gain is improved.
- Normally, women lose weight postpartum. A lactating woman with HIV should take steps to minimize postpartum weight loss. If she loses too much weight, counseling to promote weight maintenance/gain should be provided, along with medical screening for disease. An action plan, similar to the one described above, should be developed, maintained, and monitored carefully.

B.3. Dietary Recommendations and Care Practices¹⁰

- The dietary recommendations for HIV-positive pregnant women should be based on the information provided in Section II. A.3 and Annexes II and IV.
- To meet the additional nutritional needs of pregnancy, animal source foods, including meat, fish, eggs and dairy products, local foods rich in iron and calcium, and fortified foods, should be emphasized, whenever feasible and culturally appropriate.
- Adapt all recommendations to changing personal circumstances as information is gathered during the assessment and follow-up visits.

Information on managing HIV- and AIDS-related symptoms may be particularly helpful for HIV-positive pregnant women, as this advice may be needed to decrease the effects of pregnancy symptoms, as well as any related to diseases.

10. This section is based on Uganda 2003; Zambia 2004.

B.4. ART and Other Medications during Pregnancy and Lactation¹¹

HIV-positive pregnant women may take ARV medications to prevent MTCT (referred to as ARV prophylaxis) or to treat their HIV disease. WHO guidelines outline when to initiate ARV treatment, with special consideration of pregnant and lactating women. The length and type of ARV regimens will influence their impact on food and drug interactions (see Section II. A.4).

B.5. Management of Wasting or Severe Malnutrition

Specific guidance on the management of wasting or severe malnutrition does not exist for HIV-positive pregnant or lactating women. Section II. A.5 outlines recommendations for the management of wasting in HIV-positive women.

“Nutrition advice, counseling, care, and support for HIV-infected women are especially important because of the dual burdens of HIV and reproduction (pregnancy and breastfeeding) on nutritional vulnerability.”

Nutrition Counseling, Care and Support for HIV-Infected Women: Guidelines on HIV-related Care, Treatment and Support for HIV-Infected Women and their Children in Resource-Constrained Settings, WHO, 2004.

B.6. Provision of Food Supplements for HIV-Positive Pregnant and Lactating Women

Given the increases in energy and nutrient requirements of pregnancy along with the additional energy requirements associated with HIV, providing a food supplement to women who are food insecure can be an important intervention for improving maternal nutritional status and pregnancy weight gains, which in turn, can lessen disease progression, prevent HIV transmission and improve birth outcomes. Making a food supplement available to HIV-positive pregnant and lactating women determined to be in need may also increase service uptake and improve attendance in PMTCT services (WFP 2004). It is particularly critical when serving HIV-positive pregnant women that the foods provided address the nutrient and energy deficits in a culturally appropriate manner, and that they are correctly targeted and, in turn, consumed by the intended beneficiary.

Often such programs make the most sense in settings where food is also provided through MCH, ANC, or HIV/AIDS clinical care and treatment centers, thereby minimizing the potential for discrimination on the basis of HIV status.

B.7. Counseling Issues during Pregnancy and Lactation¹²

Sections II. A.7, II. A.8, and Annex V review information on what counseling topics to include. What follows are modifications or additions to recommendations that pertain to pregnant and lactating HIV-positive women.

- When providing nutrition counseling, consider cultural foods, traditional therapies, food taboos, and practices that are beneficial or harmful during pregnancy and lactation.
- Advise on dietary management of and appropriate treatment for diarrhea, nausea, vomiting, malabsorption, loss of appetite, and oral thrush, as these conditions may prevent weight gain and negatively impact nutritional status.

11. This section is based on FANTA 2004; WHO 2004.

12. This section is based on Uganda 2003; Zambia 2004.

- Provide routine counseling and support to pregnant and postpartum women on infant feeding (see Section II. C).
- Provide information on food and water safety and hygiene to help avoid food-borne illnesses.
- Discuss the effect of high physical activity workloads.

B.8. Health Education and Treatment for HIV-Positive Pregnant and Lactating Women¹³

In addition to nutrition and infant feeding support, antenatal care, including health education, should provide information on the following topics and offer the treatments specified (also see Sections II. A.7 and II. A.8):

- Advise pregnant/lactating women to seek immediate treatment for all infections, such as fever and diarrhea, or any suspected loss of weight.
- Refer for ARV care and treatment if conditions indicate treatment eligibility.
- Encourage prompt treatment for malaria and tuberculosis, including presumptive treatment and prevention through the use of insecticide-treated mosquito nets, and TB prevention and Directly-Observed Treatment, Short-Course (DOTS).
- Provide advice on hookworm infestations and de-worming.
- Encourage HIV-positive pregnant women to regularly access antenatal care so that they can maintain their health and nutritional status during pregnancy and so that complications can be managed, should they arise.
- Encourage HIV-positive pregnant women to deliver with a skilled birth attendant at a health facility to help ensure safe birthing practices and proper management of blood and other products.
- Promote postpartum family planning and dual protection (use of condoms) to ensure healthy infants and children and prevent infection or reinfection.

13. This section is based on Uganda 2003; Zambia 2004.

C. NUTRITION SUPPORT FOR INFANTS AND YOUNG CHILDREN (0 TO 24 MONTHS) BORN TO HIV-POSITIVE WOMEN

GOAL: To prevent malnutrition, improve the nutritional status of infants and young children, to reduce the transmission of HIV infection from the mother to child after delivery, and to increase HIV-free survival of infants.

Women must know their HIV status to receive appropriate counseling to help them make and carry out informed infant feeding decisions. Counseling and testing of couples should be encouraged through increased access to VCT services among the general population and specifically among pregnant and lactating women.

C.1. Infant Feeding Recommendations

In general, when HIV is not a consideration, WHO recommends the following regarding infant feeding (WHO et al. 2003b):

- Infants should be exclusively breastfed for the first 6 months of life to achieve optimal growth, development, and health.
- Thereafter, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues up to 24 months or beyond. This includes human breast or other animal milk, with adequate servings of energy and micronutrient-dense complementary foods.

INFANT FEEDING AND HIV: In areas where HIV is a public health problem, all women and their partners should be encouraged to learn their HIV status.

WHO recommends the following for infant feeding for HIV-positive women (WHO 2006c):¹⁴

- The most appropriate infant feeding option for an HIV-positive mother depends on her individual circumstances, including her health status, the local situation, health services, and availability of counseling and support.
- Exclusive breastfeeding is recommended for HIV-positive women for the first 6 months of life unless replacement feeding is acceptable, feasible, affordable, sustainable, and safe (AFASS) for them and their infants before that time (see Box 1 for a brief definition of AFASS; see Annex VII for more detail).
- When replacement feeding is AFASS, avoidance of all breastfeeding by HIV-positive women is recommended.

It is particularly important to emphasize the dangers of mixed feeding (i.e., breastfeeding and formula) to HIV-positive mothers who choose replacement feeding. This is because token or partial breastfeeding (i.e., a small amount of breastfeeding in predominantly formula-fed

14. Further WHO/UNICEF recommendations on HIV and infant feeding can be obtained from materials of the Baby-Friendly Hospital Initiative (BFHI). The 2006 revision of BFHI materials includes modules on HIV and infant feeding and mother-friendly care. BFHI represents a global effort to implement practices that protect, promote, and support breastfeeding. See <http://www.who.int/nutrition/topics/bfhi/en/index.html>.

infants) carries a particularly high risk of HIV transmission compared to predominantly or nearly exclusively breastfed infants (FANTA 2004).¹⁵

- At 6 months, if replacement feeding is still not AFASS, continuation of breastfeeding with additional complementary foods is recommended, while the mother and baby continue to be regularly assessed. All breastfeeding should stop once a nutritionally adequate and safe diet without breast milk can be provided.
- Whatever the feeding decision, health services should follow up all HIV-exposed infants, and continue to offer infant feeding counseling and support, particularly at key points when feeding decisions may be reconsidered, such as the time of early infant diagnosis and at 6 months of age.
- Governments and other stakeholders should revitalize breast-feeding protection, promotion, and support in the general population. They should also actively support HIV-positive mothers who choose to exclusively breastfeed, and take measures to make replacement feeding safer for HIV-positive women who choose that option.
- National programs should provide all HIV-exposed infants and their mothers with a package of child survival and reproductive health interventions (WHO 2005b and WHO 2006b) with effective linkages to HIV prevention, treatment, and care services. In addition, health services should make special efforts to support primary prevention for women who test negative in antenatal and delivery settings.
- Governments and mandated UN agencies should ensure that the package of interventions referenced above, as well as the conditions described in current guidance, is available before any distribution of free commercial infant formula is considered.¹⁶
- Governments and donors should greatly increase their commitment to and resources for implementation of WHO/UNICEF's *Global Strategy for Infant and Young Child Feeding* (2003) and WHO's *HIV and Infant Feeding Framework for Priority Action* (2003b) in order to effectively prevent postnatal HIV infections, improve HIV-free survival, and achieve relevant UNGASS goals.

WHO et al. (2003a) provide criteria for determining whether exclusive replacement feeding is AFASS. These criteria usually need refining at country level. Annex VII gives more detail.

"Exclusive breastfeeding is recommended for HIV-infected women for the first 6 months of life unless replacement feeding is acceptable, feasible, affordable, sustainable and safe [AFASS] for them and their infants before that time".

Consensus Statement. WHO HIV and Infant feeding Technical Consultation held on behalf of the Inter-agency Task Team (IATT) on Prevention of HIV Infections in Pregnant Women, Mothers and their Infants. Geneva, October 25-27, 2006.

15. Note that breastfeeding and giving semi-solid and/or solid foods also carries high risk of HIV transmission compared to predominantly or nearly exclusively breastfeeding.

16. See http://www.who.int/child-adolescent-health/NUTRITION/HIV_infant.htm.

BOX 1. Brief Definition of AFASS: Acceptable, Feasible, Affordable, Sustainable, and Safe

ACCEPTABLE	The mother/caregiver does not see any barriers to choosing replacement feeding for cultural or social reasons, or for fear of stigma or discrimination.
FEASIBLE	The mother/caregiver has adequate time, knowledge, skills, resources, and support to correctly prepare breast milk substitutes and feed the infant 8-12 times in 24 hours.
AFFORDABLE	The mother/caregiver, with available support, can pay the costs associated with the purchase, preparation, storage, and use of replacement feedings without compromising the health and nutrition of the family. This includes the cost of replacement foods, fuel, water, storage, etc.
SUSTAINABLE	A continuous, uninterrupted supply, along with a dependable system of distribution of all ingredients and products needed to safely practice replacement feeding for at least one year, is available.
SAFE	Replacement foods are correctly and hygienically stored, prepared, and fed with clean hands, clean cups, and other utensils. The infant has access to good quality health care in order to minimize the risk of increased morbidity, malnutrition, and mortality that occurs in non-breastfed infants.

See Annex VII for a more complete definition.

C.2. Counseling HIV-Positive Women to Make and Carry Out Infant Feeding Decisions

All HIV-positive women should be provided with routine, periodic counseling and support to ensure that they are able to make safe and appropriate infant feeding decisions and carry them out effectively. Research and programmatic evidence shows that women need at least monthly contacts, with more frequent support immediately postpartum and when changes (such as breastfeeding cessation or the introduction of complementary foods) are anticipated. This counseling and support should continue through at least 18 months postpartum and ideally through 24 months.

Most HIV programs have dealt only with early infant feeding recommendations and practices, i.e., those that cover the period from birth to 6 months postpartum. Since the weaning or complementary feeding period (from 6 to 24 months) is of increasing concern to researchers and program managers, the two periods are discussed separately below.

As noted, exclusive breastfeeding for children of HIV-positive women is recommended from birth to 6 months unless replacement feeding is AFASS. Recommended practices for each of these options are below.

EXCLUSIVE BREASTFEEDING

If breastfeeding is determined to be the most appropriate infant feeding option (LINKAGES 2005; FANTA 2004):

- Mothers should exclusively breastfeed for the first 6 months of life, that is, only provide breast milk and prescribed medications—no water, other liquids, or foods. It is critical to reinforce the importance of avoiding mixed feeding (feeding infants with breastmilk and other fluids, and semi-solid or solid foods) as it is associated with a higher risk of HIV transmission than exclusive breastfeeding (WHO 2005c).
- During exclusive breastfeeding, mothers should be counseled on how to solve common difficulties, such as sore nipples, perceptions of “insufficient milk,” engorgement, manual expression, and storage of breast milk.
- To decrease the risk of MTCT, mothers should seek immediate treatment for mastitis, cracked nipples, infant mouth lesions, and thrush.
- Mothers should not cease exclusive breastfeeding until—with counseling and assessment—another option is determined to be AFASS. An optimum time for early cessation of breastfeeding for HIV-positive women has not been established. If cessation of exclusive breastfeeding is determined to be AFASS before 6 months postpartum, mothers should be assisted in the transition to exclusive replacement feeding or another appropriate breastmilk feeding option.
- Mothers should be counseled and assisted to ensure that appropriate complementary foods are added to infants’ diet beginning at 6 months (see Sections II. C.3 and II. C.4).

REPLACEMENT FEEDING

A mother who is replacement feeding should use replacement feeding exclusively.

Feeding commercial formula requires a number of conditions for the replacement to be AFASS, including safe water, fuel, and utensils, as well as the skills and time to prepare it correctly and hygienically.

Unacceptable options for replacement feeding include:

- sweetened condensed milk
- skimmed milk or reconstituted skim powdered milk
- coffee creamers
- soy milk
- fruit juices
- sugar water
- teas
- diluted porridge

“Studies support that exclusive breastfeeding is associated with less HIV transmission than mixed breastfeeding.”

Participants’ Statement, WHO Consultation on Nutrition and HIV/AIDS in Africa, Durban, South Africa, April 10-13, 2005.

“HIV-positive mothers who breastfeed should be provided with specific guidance and support when they cease breastfeeding to avoid harmful nutritional and psychological consequences and to maintain breast health.”

HIV and Infant Feeding: A Guide for Healthcare Managers and Supervisors, WHO, 2003.

Formula is the preferred option for replacement feeding in the first 6 months of life, but when commercial formula is too expensive or not available, animal milk can be modified at home and used for replacement feeding. This requires access to one-half liter of animal milk or milk product, safe water, and sugar, along with proper instructions for modifying the milk and the ability to follow them (LINKAGES 2005).¹⁷ As the animal milk/milk products lack micronutrients and essential fatty acids, micronutrient supplementation and cooking oil (e.g., soybean oil) are recommended with home preparation.

“When HIV-infected mothers choose not to breast-feed from birth or stop breastfeeding later, they should be provided with specific guidance and support for at least the first two years of the child’s life to ensure adequate replacement feeding.”

“Programs should strive to improve conditions that will make replacement feeding safer for HIV-positive mothers.”

HIV and Infant Feeding: A Guide for Health Care Managers and Supervisors, WHO, 2003.

Mothers/caregivers who choose exclusive replacement feeding must be shown how to prepare the replacement feeding according to instructions. The following information and support should also be provided (FANTA 2004):

- Observe the mother/caregiver preparing the infant’s replacement feeding. Correct any problems and reinforce the necessary skills and knowledge.
- Assess and resolve any problems the mother/caregiver may have with exclusive replacement feeding.
- Counsel mothers and families on proper food hygiene.
- Reinforce the risks of mixed feeding.
- Provide information on appropriate introduction of complementary foods to begin when the child is 6 months old (see Section II. C.3).
- Encourage the mother/caregiver to seek care when the infant is sick and to attend regular infant-weighing and well-baby visits.
- Ensure that the mother/caregiver has appropriate micronutrient supplements for the infant and that they are regularly given.

C.3. Feeding Infants (6 to 24 Months) Born to HIV-Positive Mothers

If recommended practices are followed, HIV-exposed infants will be exclusively breastfed or exclusively replacement fed for the first 6 months postpartum. For all HIV-exposed infants, as for non-exposed infants, complementary foods should be introduced at 6 months, in addition to either continued breastfeeding or continued replacement feeding (PAHO and WHO 2002; WHO 2005d; WHO 2006c).

APPROPRIATE TIMING OF BREASTFEEDING CESSATION

Breastfed infants of HIV-positive mothers should continue to breastfeed until, with appropriate counseling and assessment, replacement feeding is determined to be AFASS. For HIV-negative and women of unknown status, breastfeeding is recommended to continue to at least 24

17. For preparation guidelines and recipes to make infant formulas at home, see LINKAGES 2005 (http://www.linkagesproject.org/media/publications/Technical%20Reports/Infant_Feeding_Options.pdf); WHO et al. 2005.

months. Although many countries have policies that encourage abrupt breastfeeding cessation (also called abrupt weaning) for HIV-positive mothers by 6 months postpartum, this practice is no longer recommended (WHO 2006c). The optimal length and timing of transition of early breastfeeding cessation (from exclusive breastfeeding to exclusive replacement feeding) for HIV-positive women is yet to be established. Expert opinion suggests that the length of transition will usually take from 2–3 days to 2–3 weeks. This will depend on how quickly the mother and infant can make this transition, in terms of their physical and emotional health and local situation. As for when the transition should occur, since complementary foods should be introduced at 6 months, the transition to exclusive replacement feeding could take place around or beyond that time, when animal milk or another animal-source food is available.

NEW EVIDENCE ON MORBIDITY, MORTALITY, AND BREASTFEEDING CESSATION

- In settings where antiretroviral prophylaxis and free infant formula were provided, the combined risk of HIV infection and death by 18 months of age was similar in infants who were replacement fed from birth and infants breastfed for 3 to 6 months (Botswana and Côte d'Ivoire).
- Early cessation of breastfeeding (before 6 months) was associated with an increased risk of infant morbidity (especially diarrhea) and mortality in HIV-exposed children in completed (Malawi) and ongoing studies (Kenya, Uganda, and Zambia).
- Early breastfeeding cessation at 4 months was associated with reduced HIV transmission but also with increased child mortality from 4 to 24 months in preliminary data presented from a randomized trial in Zambia.
- Breastfeeding of HIV-positive infants beyond 6 months was associated with improved survival compared to stopping breastfeeding in preliminary data presented from Botswana and Zambia.

COMPLEMENTARY FEEDING

The complementary feeding principles for non-breastfed young children are similar to those for breastfed children when sufficient quantities of an alternate milk source are available; however, when this is not the case, providing an adequate diet is difficult, and growth faltering is common among non-breastfed infants. Diets without animal food sources (meat, poultry, fish, or eggs, plus milk products) cannot meet all the nutrient requirements for infants or young children unless fortified foods and/or nutrient supplements are used (WHO 2005d).

- **AMOUNT OF FOOD NEEDED:** Ensure that energy needs are met.
6–8 months of age: Approximately 600 kcal per day;
9–11 months of age: Approximately 700 kcal per day;
12–23 months of age: Approximately 900 kcal per day.
- **FOOD CONSISTENCY:** Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities.

"There is an immediate need to evaluate suitable ways of meeting nutritional needs of infants and young children who are no longer breastfed."

Participants' Statement, WHO Consultation on Nutrition and HIV/AIDS in Africa, Durban, South Africa, April 10-13, 2005.

6 months: pureed, mashed, and semi-solid foods;
8 months: “finger foods,” i.e., snacks eaten by children alone, can be added;
12 months: most children can eat the same foods as other family members.

- MEAL FREQUENCY AND ENERGY DENSITY: Meals should ideally be provided 4–5 times per day, with additional foods offered 1–2 times per day, as needed.
- NUTRIENT CONTENT OF FOODS: Feed a variety of foods to ensure that nutrient needs are met.
- USE OF VITAMIN-MINERAL SUPPLEMENTS OR FORTIFIED PRODUCTS: As needed, use fortified foods or vitamin-mineral supplements that contain iron. If animal foods are lacking in the diet, fortified foods or supplements should contain other micronutrients, e.g., zinc, calcium, and vitamin B12. Vitamin A supplementation is also recommended for children 6–59 months when vitamin A deficiency is prevalent or under-five mortality is high (> 50/1000).
- FLUID NEEDS: Non-breastfed infants and young children need at least 400–600 ml/day of extra fluids in temperate climates and 800–1200 ml/day in hot climates. Safe, clean water should be offered several times per day.
- SAFE PREPARATION AND STORAGE OF FOODS: Good hygiene and proper food handling must be practiced. Attention to hygienic practices during food preparation and feeding is critical for prevention of diarrhea.
- RESPONSIVE FEEDING: Responsive feeding should be practiced, applying the principles of psycho-social care. Optimal infant feeding depends not only on what is fed, but also on how, when, where, and by whom. Adequate time needs to be allowed to feed the infant during meals to ensure the child consumes adequate amounts of food.
- FEEDING DURING AND AFTER ILLNESS: Increased fluid intake is necessary during illness and the child should be encouraged to eat a variety of his or her favorite soft and appetizing foods. After illness, more food (including breastfeeds or replacement feeds) should be given more frequently than usual and the child should be encouraged to eat more.

C.4. Provision of Food Supplements¹⁸

Given the high energy and nutrient requirements of lactation and infancy, along with the increased energy requirements of HIV, there are several categories of beneficiaries for which food support should be considered.

- Food may be provided to lactating women participating in PMTCT programs. The food ration may be designed to meet the increased energy and nutrient requirements of lactation or to address the replenishment of nutrients following pregnancy, as well as help enable participation of food-insecure populations in the program itself.

18. This section is based on FANTA 2004; Greenaway et al. 2004; WFP 2004.

- At the same time, food should never be used to bias an HIV-positive woman's feeding choice. For example, if replacement foods are provided for non-breastfed infants, equivalent foodstuffs should be provided to breastfeeding women and their families.
- HIV-positive women choosing to feed their infants with formula may be provided infant formula for a specified period in situations where requirements for the safe provision of replacement feeding are met (see Section II. C.1).
- For infants over 6 months, a food package of a fortified complementary food may be provided to support adequate growth. Work is ongoing to identify the best fortified foods to meet the nutritional needs of non-breastfed infants.
- Ensuring that the foods provided are culturally appropriate, address the nutrient and energy deficits, are appropriately targeted, and consumed by the intended beneficiary is critical when serving postpartum and lactating women living with HIV and their infants.

C.5. Infant Feeding Counseling¹⁹

Infant feeding counseling, which involves establishing a rapport with the client and engaging her in a dialogue of open and honest communication, has been shown to be more effective than simply providing advice on infant feeding.

Skilled counseling can also assist HIV-positive women to select and comply with safer infant feeding options, as well as help reduce breast health problems.

The currently limited number of people trained in infant feeding counseling and the level of understanding of infant feeding in the context of MTCT in the general population are constraints that need to be overcome in order to effectively counsel women (WHO 2001). The counseling must also be sensitive to the stigma and discrimination attached to HIV in the community.

The benefits of counseling can be significant. For example, improved adherence and longer duration of exclusive breastfeeding up to 6 months were achieved in HIV-positive and non-HIV-infected mothers when they were provided with consistent messages and frequent, high-quality counseling in South Africa, Zambia, and Zimbabwe.

The three objectives of infant feeding counseling are to (WHO et al. 2005):

- Provide women with information about the risks and benefits of various feeding methods;
- Guide women in choosing the method that is most suitable for their situation; and
- Support women in the method chosen by assisting them in implementing it safely and effectively.

"Evidence shows that safer infant feeding can be achieved with adequate support, however, health systems and communities are not providing this support to make infant feeding safer."

Participants' Statement, WHO Consultation on Nutrition and HIV/AIDS in Africa, Durban, South Africa, April 10-13, 2005.

19. *Infant and Young Child Feeding Counselling: An Integrated Course* (WHO/UNICEF, in preparation) will provide additional information and combine information on breastfeeding, complementary feeding, and HIV support in a training package.

The following are recommendations for the implementation of infant feeding counseling and support (WHO 2001):

- HIV-positive mothers should receive counseling that includes information about the risks and benefits of various safe infant feeding options, and guidance, free from coercion or bias, in determining and practicing the most suitable option for them and their babies. This is the basis of informed choice.
- No matter which option a woman chooses among those considered safe and effective, she should be supported to exclusively follow or carry out that option. All women should be provided with regular, periodic counseling and support for at least the first 18 months, and ideally for 24 months, postpartum.
- Local assessments should be conducted to identify the range of infant feeding options that are AFASS within program areas.
- Increased numbers of individuals who can provide infant feeding counseling to HIV-positive women are critically needed and should be trained, deployed, and supervised. Ongoing support, to include updated training as information and recommendations change, is necessary.

HIV-positive mothers should be counseled on infant feeding options at the following times (WHO et al. 2003a; WHO et al. 2005):

- After an HIV-positive test, but prior to delivery, so as to assist the mother in determining the best feeding method for her infant.
- Soon after birth to teach the mother how to implement her selected infant feeding method.
- Within the first week of delivery to evaluate the mother's success in implementing her infant feeding choice and to assist where necessary.
- At least once a month for the first 18–24 months and more frequently at specific times as noted below. These periodic support visits can be combined, where feasible, with routine postpartum visits, well-child check-ups, sick-child visits, immunization visits, HIV treatment visits, or any other locally feasible routines that reach postpartum mother-infant pairs. The important point is to establish and maintain regular and periodic infant feeding counseling and support for the entire critical first 2 years of the infant's life.
- After infant HIV diagnosis and at 6 months when complementary feeding is required to begin.
- When a mother intends or anticipates a need to change her current feeding practice. Counseling and support at this point may either help her to determine that it is best to maintain her current practice if appropriate and safe, or help her make the appropriate changes, if necessary.
- Additional sessions may be necessary at high-risk times (e.g., if breast problems arise).

D. NUTRITION SUPPORT FOR HIV-POSITIVE INFANTS AND YOUNG CHILDREN (0 TO 24 MONTHS)

GOAL: To improve clinical and nutritional outcomes in infants and young children through nutritional assessment, counseling, and support.

HIV antibody tests are not reliable in children under the age of 15 to 18 months, since many uninfected infants born to HIV-positive mothers will test positive due to passively transferred maternal antibodies in their systems that react to the test. Many countries are introducing PCR-testing that can reliably determine infection as early as 6 weeks of age, but the tests are relatively expensive, technologically more demanding, and will not be widely available in resource-constrained settings for some time (FANTA 2004). Practically, most infants less than 18 months old are diagnosed using clinical algorithms for suspected or severe HIV disease (e.g., IMCI, including growth faltering). Eighty to 85 percent of HIV-exposed infants test PCR-negative at 6 weeks. This rises to greater than 90 percent uninfected when combination maternal-infant ARV prophylaxis and treatment for HAART-eligible women is provided (WHO et al. 2003b; WHO 2006b).

D.1. Nutritional Requirements and Care for HIV-Positive Children

When a child is determined to be HIV-positive, however, dietary changes should be made to reflect the following recommendations. For breastfed infants and young children diagnosed with HIV, continuation of breastfeeding and complementary feeding is advised, according to the recommendations for the general population (FANTA 2004; WHO 2005c; WHO 2005e). Table 2 lists the energy and protein requirements for HIV-positive children.

TABLE 2. *Nutritional Requirements for HIV-Positive Children*

ENERGY REQUIREMENTS	<p>For asymptomatic children, energy requirements are increased by 10 percent over those for a healthy child of the same age (FANTA 2004; WHO 2003a).</p> <p>When the child is symptomatic, but not losing weight, the energy requirements are increased by 20 to 30 percent over those for a healthy child of the same age (FANTA 2004).</p> <p>When the child is symptomatic and experiencing weight loss, the energy requirements are increased by 50 to 100 percent over those for a healthy child of the same age (FANTA 2004; WHO 2003a).</p>
PROTEIN AND MICRONUTRIENT REQUIREMENTS	<p>The protein and micronutrient requirements are the same for HIV-positive children as for their healthy peers (FANTA 2004).</p> <p>HIV-positive, 6-to-59-month-old children living in resource-limited settings should receive vitamin A supplements (100,000 IU for infants 6–12 months and 200,000 IU for children older than 12 months) every 4–6 months (WHO 2003a; WHO et al. 1997). This guideline is the same as the WHO recommendation for the prevention of vitamin A deficiency in children.</p> <p>Children with pre-existing micronutrient deficiencies or inadequate protein intake may require micronutrient supplementation or increased protein intake.</p> <p>Households with HIV-positive children, like all households, should use iodized salt (FANTA 2004).</p>

D.2. Nutritional Assessment, Growth Monitoring, and Counseling for the HIV-Positive Child²⁰

- The HIV-positive child should be weighed and measured regularly and his or her growth plotted to detect early growth faltering.
- The child should be screened for any feeding problems or signs of malnutrition.
- A dietary history and feeding practices inventory should be obtained, along with a household food security assessment.
- Nutrition counseling and education should be based on consuming locally available and affordable foods of adequate quantity and quality. This should also emphasize the increased energy and nutrient needs for growth and recovering weight loss following illness.
- When problems are detected, the mother/caregiver, along with the counselor, should develop an action plan. Appropriate referrals and follow-up visits should be scheduled.
- Identified malnourished HIV-positive children should be referred for appropriate treatment (see Section II. D.5).
- Food-insecure households with HIV-positive children should be referred for food assistance and other socio-economic support.

WHO (2007) provides additional guidance on the nutritional care of HIV-positive children between 6 months and 14 years of age at primary health care facilities and treatment sites:

■ ASSESS, CLASSIFY, AND DEVELOP A PLAN

Assess and classify the child's growth, and develop a nutrition care plan.
Regular and careful assessment of a child's growth can identify complications early, and offer the opportunity to intervene.

Assess the child's nutritional needs.
The nutritional needs of HIV-positive children depend on the stage of disease and history of recent complications, such as persistent diarrhea or opportunistic infections.

Develop a nutrition care plan.
Nutritional needs are best met through balanced and varied diets. When not available, or demands are high, additional support may be needed.

■ IMPLEMENT THE NUTRITION CARE PLAN

What does the child eat and drink?
Developing a nutrition care plan starts with understanding what the child presently eats and drinks. The type of food given and how it is prepared can be as important as the amount and frequency of food eaten.

20. This section is based on Uganda 2003; Zambia 2004.

Who gives the child food and how does the child eat?

Children should be fed with care and patience. Before offering information and suggestions, first find out who is the main caregiver for the child and who else is involved with feeding and care. This helps to understand the quality and consistency of care practices.

Is there food and income at home?

All children need regular, adequate, and appropriate foods in order to grow, develop, and maintain optimal body function. Nutrition is determined not just by the food itself, but also by the entire process of having access to food, including the quantity and quality of food and how it is given to a child, as well as how the body uses it.

Discuss exercise and avoid risk factors for malnutrition.

Physical activity and play help children to develop and maintain strong muscles and improve their sense of well-being.

Decide if the child should be referred, and when to review.

HIV-positive children should be referred to other health/care facilities when specific needs are identified, health workers with other skills are required, or when other resources might help.

CHILDREN WITH SPECIAL CONSIDERATIONS

The HIV-positive child with poor appetite, mouth sores, or diarrhea can often still be managed at home if the correct help is offered early. HIV-positive children who receive ART still require appropriate and adequate nutrition to achieve the full benefits of ART.

D.3. Dietary Management of AIDS-related Symptoms, Medications, and Food-Drug Interactions in Children

See Section II. A.3 and Annex II for information on the management of HIV- and AIDS-related symptoms, as management for children is similar to that for adults. Care should be taken here, as elsewhere, to avoid stigmatizing the child.

D.4. Provision of Food Supplements²¹

With the high energy requirement for HIV-positive infants and young children in addition to their energy and nutrient requirements for growth, a food supplement targeted to HIV-positive infants and young children should be considered. In addition, households with HIV-positive children identified as food insecure may benefit from a family ration. Since length of food assistance to families and individuals may be a consideration, linking food supplementation with nutrition education and livelihood programs may be an important strategy.

- Targeting HIV-positive, moderately malnourished children for food assistance is also advised, and should be implemented in accordance with national protocols. Ensuring that the foods provided are culturally appropriate, address nutrient and energy deficits, and are well targeted is important.

21. This section is based on Greenaway et al. 2004 and WFP 2004.

D.5. Treatment for Severely Malnourished HIV-Positive Children

Given the increased energy requirements, opportunistic infections, other diseases and symptoms that make eating more difficult, HIV-positive children are at higher risk for malnutrition compared to uninfected children. Severe malnutrition in HIV-positive children can be successfully treated with hospital- or home-based therapeutic feeding; however, their recovery time is longer than that of uninfected children (Piwoz 2004a; WHO 2005e). The initial treatment for HIV-positive, severely malnourished children is the same as for non-HIV-infected children (WHO 2005e).

- HIV-positive, severely malnourished children, defined as weight-for-height less than 70 percent of the NCHS median (or -3 SD), presence of edema on both feet, or clinical signs of malnutrition, should be referred immediately for nutritional rehabilitation (WHO 1999).
- In the absence of international guidelines for the treatment of severe malnutrition in HIV-positive children, HIV-positive malnourished children should be managed according to government protocols or WHO guidelines for the treatment of severe malnutrition (WHO 2003a).

D.6. Health Interventions for HIV-Positive Children²²

- All infections should be treated quickly. Mothers should be encouraged to seek health care as soon as her HIV-positive child becomes sick. An extra meal per day after episodes of illness, to support catch-up growth, is advised (WHO 2005c).
- HIV-positive children should receive well-child services according to government protocols.
- Children suspected of having HIV, according to clinical algorithms or guidelines, should be referred for further evaluation and ARV treatment and care where available.
- Children with HIV or suspected to have HIV, but not symptomatic, should be given all appropriate vaccines according to national protocols (WHO 2005e).
- Starting at the age of 12 months, presumptive deworming should be performed (WHO 2005c).
- Households with HIV-positive children should have a safe water system or use boiled water.
- Hygiene and sanitation education, particularly as to how good hygiene and sanitation relate to the prevention of infections, should be provided and reinforced.

22. For additional information on the young child from an operational perspective, see Operational Guidelines for Supporting Early Child Development (ECD) in Multi-Sectoral HIV/AIDS Programs in Africa, a joint document of the World Bank, UNICEF, and UNAIDS. See <http://siteresources.worldbank.org/INTECD/Resources/OperGuideBookFinalEnglish.pdf>.

E. NUTRITION SUPPORT FOR PLHIVS ON ART

GOAL: To improve clinical and nutritional outcomes through enhancing the effect of ART with the provision of nutritional assessment, counseling, and support.

E.1. ARV Treatment and Nutrition²³

When patients adhere to ART, the treatment will most often suppress viral replication, slow disease progression, and improve nutritional status. People initiating ARV treatment may experience increased appetite, thus requiring dietary counseling on how to meet nutrient needs with available foods. For food-insecure people, food support may be needed in order to act on dietary counseling recommendations.

While they save lives, ARVs may cause adverse side effects. They may negatively interact with food, affecting nutritional and treatment outcomes. In addition, ARVs may cause lipodystrophy, or fat redistribution, and associated metabolic changes or anemia may occur. Long-term elevated risks for diabetes, cardiovascular disease, and osteoporosis may also sometimes be associated with HIV and ARVs, and require nutritional management.

E.2. Interactions between ART and Food and Nutrition²⁴

Managing the interactions between ART and food and nutrition is critical in improving the effectiveness of ARVs while minimizing their negative nutritional impact and increasing adherence to drug regimens. Nutritional assessment, counseling, and support, as described in Sections II .E.3 and II. E.4, can help to identify and mitigate the negative effects of ART and food and nutrition interactions, as summarized below.

- Some ARV medications should be taken with food, others on an empty stomach, and others with or without specific types of foods.
- Certain ARV medications affect nutrient absorption, metabolism, distribution, and excretion.
- These medications may also cause side effects, such as nausea, taste changes, and loss of appetite, that can reduce food consumption. Additional side effects such as diarrhea and vomiting may increase nutrient losses. Dietary changes can help PLHIVs manage such side effects and reduce their impact on nutritional status.
- Some ARVs can cause important adverse reactions when combined with certain foods. Care should be taken to help ART patients avoid any contraindicated foods.
- Different drugs have different food interactions; thus, when PLHIVs take more than one drug at a time (more than one ARV and/or other medication to treat infections or disease), the

“The lifesaving benefits of ARVs are clearly recognized. To achieve the full benefits of ARVs adequate dietary intake is essential.”

Participants’ Statement, WHO Consultation on Nutrition and HIV/AIDS in Africa, Durban, South Africa, April 10-13, 2005.

23. This section is based on FANTA 2004.

24. This section is based on FANTA 2004.

interactions and requirements of each drug need to be considered, as well as the drug–drug interaction. Additionally, any traditional therapies being used should be taken into account. Food and drug timetables can be planned to meet specific requirements.

E.3. Nutritional Assessment

Periodic nutritional screening and assessment, as described in Section II. A.2, is recommended for patients receiving ART. In addition to what is noted in that section, hemoglobin, triglycerides, cholesterol, and blood sugar should be assessed periodically (Uganda 2003).

E.4. Food, Nutrition, and Health Education Counseling

Managing AIDS-related symptoms is even more complicated for patients on ART; thus, counseling is an integral component of treatment, care, and support programs for PLHIVs. Building on Sections II. A.7 and II. A.8, nutrition counseling and support for PLHIVs on ART should also pay attention to the following (FANTA 2004):

- Current information on the effects of their medications on nutrient absorption and metabolism.
- The appropriate sequencing of food and drug intake.
- Dietary management to minimize the negative effects of their medications (see Annexes II, III, and IV).
- Information and advice on appropriate foods and dietary practices in cases of increased appetite.
- The importance of adhering to the meal and drug timetables with assessments and feasible adjustments made to deal with any difficulties.

“Dietary and nutrition assessment is an essential part of comprehensive HIV care both before and during ARV treatment.”

Participants’ Statement, WHO Consultation on Nutrition and HIV/AIDS in Africa, Durban, South Africa, April 10-13, 2005.

“National health authorities should prepare for ART access by training relevant personnel on counseling and managing ART’s long-term nutritional aspects.”

Nutrient Requirements for People Living with HIV/AIDS: Report of a technical consultation. WHO, Geneva, Switzerland, 13-15 May, 2003.

Table 3 provides a summary of the nutrition interventions in Section II, noting the relevant target populations and the anticipated results.

TABLE 3. Summary: Target Populations, Nutrition Interventions, and Anticipated Results

TARGET POPULATION	RELEVANT NUTRITION INTERVENTION	ANTICIPATED RESULTS
Adults Living with HIV (PLHIVs)	Nutritional assessment	<ul style="list-style-type: none"> • Identification and correction of poor eating behaviors and dietary improvements • Provision of the basis for appropriate counseling and decisions about the need for interventions
	Nutrition counseling and support	<ul style="list-style-type: none"> • Management of AIDS-related symptoms and improved diets • Strengthened treatment protocols
	Provision of food supplements, including therapeutic feeding	<ul style="list-style-type: none"> • Compensation for food deficits resulting from food insecurity • Stabilization of patients prior to and during ART
	Lifestyle counseling, including psychological support	<ul style="list-style-type: none"> • Prevention of infections and transmission of virus • Improvement of quality of life, including a reduction in depression, stigma, and stress
HIV-Positive Pregnant and Lactating Women	Nutritional assessment	<ul style="list-style-type: none"> • Identification of risk factors for developing future nutritional complications
	Nutrition support, including iron and folic acid supplements, vitamin A supplements, and iodized salt	<ul style="list-style-type: none"> • Preservation of maternal nutritional status and improved birth outcomes
	Provision of food supplements	<ul style="list-style-type: none"> • Improvement in maternal nutritional status and pregnancy weight gains • Improvement in birth outcomes and birth weights • Reduction in disease progression and prevention of HIV transmission • Increase in service uptake, including PMTCT services
	Nutrition counseling	<ul style="list-style-type: none"> • Management of AIDS-related symptoms and improved diets of HIV-positive pregnant and lactating women
	Antenatal care and health education	<ul style="list-style-type: none"> • Improvement in maternal health and nutritional status and birth outcomes • Improvement in uptake of treatments (e.g., for malaria, TB, hookworm) • Increase in skilled attendance at birth and postpartum family planning

TARGET POPULATION	RELEVANT NUTRITION INTERVENTION	ANTICIPATED RESULTS
Infants and Young Children (0 to 24 Months) Born to HIV-Positive Women	Feeding counseling for HIV-positive pregnant women (at least monthly for 18–24 months)	<ul style="list-style-type: none"> • Safe and appropriate infant feeding decision-making (with respect to exclusive breastfeeding, replacement feeding, complementary feeding, etc.) • Improvement in adherence to and longer duration of exclusive breastfeeding and reduction in risk of MTCT
	Provision of food supplements for postpartum and lactating women	<ul style="list-style-type: none"> • Improvement in adherence to PMTCT programs • Improvement in and replenishment of energy and nutrient intake for mothers and infants
	Where appropriate, provision of AFASS ²⁵ infant formula and food package of fortified complementary food	<ul style="list-style-type: none"> • Adequate growth of infant • Reduction in risk of MTCT
HIV-Positive Infants and Young Children (0 to 24 Months)	Nutritional assessment and nutrition care plan	<ul style="list-style-type: none"> • Assessment and classification of a child's growth and nutritional needs • Development and implementation of a nutrition care plan • Increase in effectiveness of ART
	Provision of AFASS food supplements for complementary feeding for infants above 6 months of age	<ul style="list-style-type: none"> • Improvement in energy and nutrient intake • Improvement in clinical and nutritional outcomes
	Health interventions	<ul style="list-style-type: none"> • Management and treatment of infections • Management of severe malnutrition • Increase in uptake of ARV
PLHIVs on ART (in addition to general recommendations for PLHIVs)	ARV treatment	<ul style="list-style-type: none"> • Suppression of viral replication and deceleration of disease progression • Improvement in nutritional status
	Nutritional assessment (including hemoglobin, triglycerides, cholesterol, and blood sugar)	<ul style="list-style-type: none"> • Identification and mitigation of negative effects of ART and food/nutrition interactions
	Food, nutrition, and health education counseling	<ul style="list-style-type: none"> • Mitigation of negative effects of ART and food/nutrition interactions • Increase in compliance with prescribed ART regimen
	Provision of food supplements, including therapeutic feeding	<ul style="list-style-type: none"> • Stabilization of patients prior to and during ART and increased efficacy of ART regimen

25. AFASS is defined as “acceptable, feasible, affordable, sustainable, and safe.” See Annex VII for a full definition.

III. FOOD ASSISTANCE AS HIV AND AIDS TREATMENT SUPPORT

Several studies have shown that malnutrition is a common problem among people undergoing treatment in resource-poor settings, and that wasting is one of the best predictors of risk of mortality (Paton et al. 2006; Zachariah et al. 2006). While not all wasting among PLHIVs is caused by lack of food, qualitative and quantitative studies of the needs of people being treated in resource-poor settings often list food as one of their greatest needs (Au et al. 2006; Mshana et al. 2006). The challenge is to develop ways of integrating food into treatment support packages in an equitable way that makes sense and is realistic given capacity constraints.

Food assistance can have multiple objectives in supporting treatment for PLHIVs. It can help enable food-insecure households to participate in treatment programs, increase adherence to treatment, and help prevent or treat malnutrition (Grant 2006; Greenaway et al. 2004; WFP 2004).

Although several studies are currently underway, few studies exist from Sub-Saharan Africa on the impact of food assistance on treatment outcomes in PLHIVs (Egge and Strasser 2005). Consequently, international guidance on food assistance and HIV and AIDS in general and, more specifically, on how food assistance relates to treatment support is limited.²⁶ The following guidance draws from the few available documents and known good practice for targeted food assistance.

Table 4 gives an overview of various objectives and types of food assistance interventions. Note that useful distinctions can be made by types of assistance, given program objectives.²⁷ Therapeutic and supplementary feeding are based on anthropometric assessment, for instance, while supplemental feeding is not. Therapeutic feeding is the provision of specialized foods aimed at treating severe acute malnutrition in community-based outpatient services or in inpatient health facilities or hospitals. Supplementary feeding is provided to individuals to prevent or alleviate specific nutritional deficiencies and undernutrition, including mild-to-moderate acute malnutrition. Supplemental feeding provides additional food to populations based on recognition of increased nutrient needs and nutritional vulnerability, but not necessarily specific anthropometric assessment. Supplemental feeding, for instance, would be provided to all participants in a PMTCT program or to all members of a specific vulnerable group, such as ANC/PMTCT mothers, infants and young children, or orphans.

The target beneficiaries and content of food assistance should be based on the program's objectives and an understanding of the quality of the client's diet as well as his or her food habits and consumption patterns. Generally foods should be fortified with micronutrients or be more nutrient dense, for example. It is particularly important to understand the acceptability of potential foods, particularly given the eating and digestive difficulties associated with HIV. The program design should also take ration size and composition into account.

As with food-assistance programs in general, if the food provided is intended to enable people to participate in the program, program designers should consider the monetary value of the food ration to the intended beneficiaries in addition to its nutritional content.

26. WFP/WHO/Albion Street Center's *Incorporating nutrition and food assistance into HIV care and treatment programmes* (forthcoming) will add to this documentation.

27. PEPFAR and USAID, for example, use these distinctions to consider how to program food support in the HIV context. For more information, please refer to: http://www.usaid.gov/our_work/humanitarian_assistance/ffp/FFP_pepfar_conceptual.pdf.

Close integration of food assistance with HIV and AIDS programs can be particularly important when the objective of food assistance is to support treatment outcomes. Providing food in addition to health care and other services can improve targeting, help with dissemination of information, and have therapeutic effects on health and nutrition. Linking participation in food assistance programs with nutrition education and skills training can foster self-reliance (Kayira et al. 2004). Annex VIII provides examples of programs that integrate food assistance with HIV and AIDS programs.

For treatment and prevention of malnutrition, the program should consider whether the ration will be received and utilized by the intended beneficiary. Therefore, the program should have specific criteria for beneficiary eligibility (such as household-level food insecurity) and also clearly reflect an understanding of intrahousehold dynamics. Often assessments are done before starting a program to help to make decisions about ration size and determine whether a family ration is necessary to address sharing or vulnerability experienced by the household.

Greenaway et al. (2004) note that program sustainability may depend on developing specific criteria for beneficiary graduation and a program exit strategy.

TABLE 4. Food Interventions and HIV and AIDS Treatment

OBJECTIVE	FOOD INTERVENTION
<p>Enabling</p> <ul style="list-style-type: none"> • ART adherence/effectiveness • Program participation 	<ul style="list-style-type: none"> • Supplemental feeding for individuals, often with household food support
<p>Prevention of Malnutrition Among</p> <ul style="list-style-type: none"> • Exclusively breastfeeding (before 6 months) or breastfeeding (6–24 months) mothers • Non-breastfed infants • Infants and children over 6 months • Men and non-pregnant women • Pregnant women 	<ul style="list-style-type: none"> • Foods for exclusively breastfeeding mothers • Replacement foods for non-breastfed infants or the equivalent in food for HIV-positive mothers who continue to breastfeed until it is AFASS to stop • Complementary feeding for infants over 6 months • Supplemental feeding for children and adults
<p>Treatment of Malnutrition Among</p> <ul style="list-style-type: none"> • Infants, children, adults 	<ul style="list-style-type: none"> • Supplementary feeding for the treatment of mild-to-moderate acute malnutrition in infants, children, or adults • Therapeutic feeding for the treatment of severe acute malnutrition in infants, children, or adults

Source: Adapted from Grant (2006).

IV. FOOD, FOOD SECURITY, HIV, AND AIDS

40

Food insecurity is both an outcome of and a contributor to the HIV/AIDS pandemic. Families with a member living with HIV are more apt to be poor and food insecure. Being infected with HIV limits productivity, leading, in turn, to loss of income while increasing health care costs. On the other hand, individuals who are food insecure may be more likely to engage in transactional sex or to become more mobile, activities that are associated with higher risk of contracting HIV. Increasing food security in poor communities and among food-insecure households can help decrease risky behaviors and prevent infection.

PLHIVs often identify their highest priority need as food, and HIV affects all three components of food security: availability, accessibility, and utilization. For example, decreased income or declines in an individual's or family's food production affect accessibility and the ability of PLHIVs to follow dietary recommendations. As noted previously, HIV may also affect an individual's ability to eat and the biological utilization of the food consumed.

Effective strategies to increase food security and enhance livelihoods can thus be an important part of prevention, mitigation, and treatment of the disease. In addition to specific interventions or broader actions to improve livelihoods, safety net or social support programs can address the needs of PLHIVs and others affected by HIV and AIDS, such as orphans and vulnerable children (OVC).

A. FOOD-BASED SUPPORT

Supporting HIV-affected households and communities provides an entry point for community-based household food security programming. To effectively utilize food in improving food security or as a component of PLHIV care and support, prevention and treatment programs will need to take local context into account, including the cultural and anthropological dimensions of the program environment. An appropriate strategy would likely include understanding of the types of food that are available, many of which are indigenous, as well as of local dietary beliefs and practices.

Much of the currently available guidance utilizes a traditional community-based approach to food security (e.g., food aid to food-insecure rural communities). Yet context is important, and programs are increasingly targeting individual households, many in urban or peri-urban areas, based on food security assessments linked to PLHIVs in care and treatment programs. FANTA and WFP (2007) covers these complex targeting issues in more depth.

In situations where a community-based approach to food-based support is appropriate, FANTA (2004) recommends a four-step process:

- Facilitate a community-led assessment of local food sources and care practices to determine the most effective uses of available food. Annexes VIII and IX describe potential ways to use food in HIV and AIDS programs, primarily, as noted above, for:
 - Nutrition care and support;
 - Incentives for participation in HIV- and AIDS-related activities; and
 - Income transfer to people infected with or affected by HIV.

- With community stakeholders, develop and implement a strategy that incorporates the results of the assessment and takes into consideration the purpose of the food, capacity for proper delivery and storage, and delivery and utilization by targeted beneficiary groups. The strategy should also include an exit or transition stage to phase out the dependence on food assistance.
- Select appropriate foods and determine ration composition and size for participants, along with frequency of distribution.
 - Foods should be selected based on nutritional content; cultural acceptability; ability to be properly processed, stored, and prepared; and ability to complement, rather than replace, local food production.
 - Rations should be based on the food intake and specific nutritional requirements of targeted beneficiaries (for example, pregnant women participating in PMTCT programs); or on the age and sex of the population; or on the average energy, protein, and micro-nutrient requirements of the household when family rations are being developed.

“When it comes to actions aimed at combating the HIV/AIDS–food insecurity nexus, the empirical base is still thin. Where organizations have launched actions that address these interactions, they have tended to be in isolation, and they are rarely monitored and evaluated. The rationale for a more proactive and collaborative engagement by food and nutrition-relevant organizations, particularly agricultural organizations — in research and in action — is thus clear.”

Gillespie, S (ed) 2006. *AIDS, Poverty and Hunger: Challenges and Responses. Highlights of the IFPRI Conference on HIV/AIDS and Food and Nutrition Security, Durban, 14-16 April 2005.*

- Link communities to other services, including health, education, hygiene, water, sanitation, growth promotion, and other food security interventions.
 - Food aid, when provided, should be part of an overall strategy that increases the capacity of HIV-affected households and communities to become independent.
 - When possible, food aid should be integrated into or linked with other HIV and AIDS program activities.

Those who design and carry out community- and household-level assessments will have to make a determination in their own context about what issues are most important and most relevant. But a broad understanding of the food-nutrition-HIV relationship can sharpen program focus and improve program effectiveness. Some information may be collected by community health workers; other information may be available through secondary sources or need to be collected as part of separate efforts.

Up-to-date information at community, household, and individual levels can be useful as part of a food security assessment and in effective and sustainable strategies to improve food security for those infected with or affected by HIV (Uganda 2003; Zambia 2004). Screening for nutritional and food security status may be part of such an assessment, with affected households or individuals being referred, where needed, to food assistance or nutrition services (Section II. A.2 provides a list of information to be collected for a nutritional assessment of a PLHIV).

At each level the food security assessment would gather information on the following:

COMMUNITY LEVEL

- The burden of HIV and AIDS in the community.
- Availability and accessibility of food (e.g., market availability, prices, seasonal variation).
- Stigma and its impact within communities and on PLHIVs.

HOUSEHOLD AND INDIVIDUAL LEVELS

- Level of food security within the household.
- Methods of processing, preserving, storing, and marketing food.
- Ability of PLHIVs to eat and digest food, and potential areas for appropriate modification of foods.
- Availability and accessibility of health, social, and financial services for households and individuals (including for non-infected but affected groups such as OVC), including those provided by the government as well as those provided by NGOs or faith-based organizations.
- Employment patterns and division of labor within the household.
- Formal and informal mechanisms for coping with food insecurity (e.g., changes in food quality, quantity, or intrahousehold distribution; food assistance and food-for-work programs; migration).
- Food consumption patterns (e.g., types, quantities, seasonal variation, number of meals, intrahousehold control and distribution, sociocultural factors).

V. HIV, AIDS, NUTRITION, AND FOOD IN AN EMERGENCY CONTEXT

When an emergency arises among populations or in geographical areas with high HIV prevalence, careful consideration should be given to how best to accommodate the special food and nutritional needs of those infected with HIV. As an emergency transitions from the acute phase into a more stable situation, emergency settings provide opportunities to offer HIV services as part of and in coordination with nutrition and food programs.

Emergencies often occur in areas of high HIV prevalence. See Box 2 for examples of ways to integrate nutrition with HIV prevention and HIV and AIDS treatment programs in refugee settings.

BOX 2. *Integrating HIV, Food, and Nutrition Activities in a Refugee Setting*

Incorporating HIV prevention into food and nutrition programs

- Incorporate activities to promote community engagement and action around HIV prevention into general food distribution
- Incorporate HIV and AIDS awareness and prevention activities into supplementary feeding programs and therapeutic feeding programs
- Incorporate activities to promote knowledge/engagement around HIV among young people into a school feeding program

Incorporating care and support for HIV-affected and vulnerable groups into food and nutrition programs

- Modify a general food distribution program to better meet the needs of PLHIVs
- Modify a supplementary feeding program to better meet the needs of population subgroups affected by HIV
- Support HIV-affected families and children through a school feeding program or a complementary ration to foster families and orphanages
- Support PLHIVs and their families through:
 - establishment of home gardens and agricultural plots
 - income-generating activities, microcredit and community banking, training and other capacity-building activities
 - food-for-work (FFW) projects
- Enable and encourage participation by HIV-positive individuals in community groups formed by people living with HIV

Incorporating food and nutrition support into health care and treatment services for PLHIVs

- Establish an inpatient hospital/clinic feeding program with nutrition education
- Establish a hospital/clinic demonstration garden with nutrition education
- Integrate a supplementary ration and nutrition education into a home-based care program or an antiretroviral therapy program

Incorporating food and nutrition resources into training and capacity-building activities for clinic- and community-based HIV and AIDS care providers, or community-level HIV-related activities

- Support training and other capacity-building activities for formal and traditional health care providers and for community resource persons who can play a vital role in HIV-prevention efforts
- Support community health volunteers engaged in HIV prevention or caring for people living with HIV and their families
- Support community awareness and mobilization activities of people living with HIV

Source: UNAIDS, UNHCR, and WFP (2006).

A. INFANT FEEDING²⁸

UNHCR (2006) and WHO (2006c) guidelines on HIV and infant feeding should be followed. As described in Section II. C.2, recommendations are:

- Where HIV testing cannot be provided, or the HIV status of the mother is unknown or she is known to be non-HIV-infected, exclusive breastfeeding is recommended for the first 6 months of life, followed by continued breastfeeding for at least 2 years.
- If HIV testing can be provided, women identified as HIV-positive need infant feeding counseling. Given the risks associated with replacement feeding in emergency settings, it may be safer for HIV-positive women to breastfeed. Ultimately, however, mothers should be supported to make and carry out informed decisions in consultation with qualified counselors.

B. HIV AND FOOD DISTRIBUTION

Some specific considerations for use of food during emergencies in populations where prevalence of HIV is high:

- Target food aid to affected and at-risk households and communities (IASC 2004).
 - To help identify the most severely HIV-affected areas, national data sets and data from UN agencies may be used. Other proxy indicators, such as mortality rates, demographic indicators, and health center data can also be used.
 - Target all food-insecure individuals, regardless of whether their HIV status is known.
- Plan nutritional and food needs for at-risk populations (FANTA 2004).
 - Calculate the energy requirements of the population.
 - Consult with a nutritionist to adapt planning to the composition of the population, as energy requirements will differ for different subgroups, including those in different stages of infection.
- Promote appropriate care and feeding practices for PLHIVs, as noted in Section IV. Choose food items that meet the energy, protein, fat, and micronutrient requirements of the population. Including micronutrient-fortified blended foods, or milled and fortified cereals, is recommended to increase micronutrient intakes.
- Pay special attention to service delivery mechanisms, as usual systems of care (e.g., community-based organizations and volunteer networks) are often disrupted. Rehabilitation or strengthening of care systems may be necessary. Increased use of home-based care may be appropriate.

“If testing for HIV is not possible, all mothers should exclusively breastfeed. Alternatives to breast milk are too risky to offer in emergency settings if a mother does not know her HIV status.”

Infant Feeding in Emergencies, Module 2, for health and nutrition workers in emergency situations, Emergency Nutrition Network, December 2004.

28. This section is based on IFE Core Group 2004.

C. FOOD AND LIVELIHOOD SECURITY IN EMERGENCIES

- Support and protect food security of HIV-affected and at-risk households and communities.
 - Review existing food and agriculture assessments to identify the most food-insecure population groups, paying particular attention to gender.
 - Develop an understanding of the specific constraints and strategies of HIV-affected households and communities.
 - Consider emergency school feeding programs, establishing sentinel school sites for data collection with local partners. Also consider feeding programs for orphans and other vulnerable children.
 - Consider the distance between a distribution site and the households to be served, particularly those with children or headed by the elderly.
 - Implement emergency school feeding programs. Establish sentinel school sites for data collection with UNICEF and local partners.
 - Implement supplementary and therapeutic feeding programs (UNHCR and WFP 2004).
 - Ensure that food aid, when provided to PLHIVs and HIV-affected families, does not increase stigmatization or make non-affected vulnerable families feel excluded.

Analysis of the linkages between food security and HIV demonstrates that the relationships work in both directions, and are systemic, affecting all aspects of livelihoods (Haddad and Gillespie 2001). An effective understanding of livelihoods is thus required to influence the causes and outcomes of HIV.

- Use food or related resources in integrated food, nutrition, and HIV-related programs to strengthen the long-term food security of affected households, e.g., seeds, tools, microcredit, and income-generating activities (UNHCR and WFP 2004).
- Provide training and technical assistance to local institutions to promote and protect household food security through training and education in agriculture and food production, and ensure the participation of at-risk populations, such as youth, including girls and orphans (IASC 2004).

Food and nutrition security are fundamentally important to the prevention, care, treatment, and mitigation of HIV and AIDS. Food insecurity and malnutrition raise the risks of HIV exposure and infection. A program of care without a nutritional component is like a leaky bucket; the efficacy of antiretroviral drug treatment may be compromised by malnutrition, and any mitigation strategy must take into account that what those affected need most is usually food, at a time when their ability to acquire it may be diminished (Gillespie and Kadiyala 2005).

VI. CONCLUSION

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This document seeks to bring together a range of information to serve as an easy, initial reference on how to integrate nutrition into HIV and AIDS treatment and programs. It outlines current key recommendations for the nutritionally-relevant treatment, care, and support of those infected and affected by HIV.

At the same time, we acknowledge this information will change. This document does not and cannot provide immutable or final answers for all countries in all situations. “Good practice” based on “best available information” changes all the time. This is especially true given the challenging nature of the disease and the very difficult conditions under which treatment, care, and support take place. New insights into good practice occur almost daily. Therefore, the guidance in this synthesis will undoubtedly evolve as new evidence or new tested approaches emerge. Yet, we hope this document has achieved its fundamental goal of producing an initial consolidation to steer future work.

This is a living document. It must be used and adapted and improved. We welcome comments from all readers, and most especially from practitioners who can suggest how to improve its usefulness, and from others who can make sure the information contained is as up-to-date as possible. Comments are welcomed by the partner organizations individually or by the World Bank at nutrition@worldbank.org.

ANNEX I: PUBLISHED HIV/AIDS, NUTRITION, AND FOOD SECURITY GUIDELINES

I. GLOBAL GUIDELINES

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FAO (Food and Agriculture Organization of the United Nations) and WHO (World Health Organization). 2002. *Living Well with HIV/AIDS: A Manual on Nutritional Care and Support for People Living with HIV/AIDS*. Rome, Italy: Food and Agriculture Organization of the United Nations.

IASC (Inter-Agency Standing Committee). 2004. *Guidelines for HIV/AIDS Interventions in Emergency Settings*. Geneva, Switzerland: Inter-Agency Standing Committee.

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WHO (World Health Organization), UNICEF (United Nations Children's Fund), UNFPA (United Nations Population Fund), and UNAIDS (Joint United Nations Programme on HIV/AIDS). 2003. *HIV and Infant Feeding: A Guide for Health-Care Managers and Supervisors*. Geneva, Switzerland: World Health Organization.

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II. REGIONAL GUIDELINES

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Tindyebwa, D., J. Kayita, P. Musoke, B. Eley, R. Nduati, H. Coovadia, R. Bobart, D. Mbori-Ngacha, and M. Pat Kieffer, eds. 2004. *Handbook on Pediatric AIDS in Africa*. Kampala, Uganda: African Network for the Care of Children Affected by AIDS (ANECCA).

III. COUNTRY GUIDELINES

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Rwanda, République du. Ministère de la Santé. 2006. *Guide National pour le Soutien et la Prise en Charge Alimentaires et Nutritionnels Pour les Personnes Vivant avec le VIH/SIDA au Rwanda*. Kigali, Rwanda: Ministère de la Santé.

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Uganda, Republic of. Ministry of Health. [2003]. *Nutritional Care and Support for People Living with HIV/AIDS in Uganda: Guidelines for Service Providers*. Kampala, Uganda: Ministry of Health.

Zambia. Ministry of Health. 2004. *Nutrition Guidelines for Care and Support of People Living with HIV/AIDS*. Lusaka, Zambia: Ministry of Health, National Food and Nutrition Commission.

Zimbabwe. Ministry of Health and Child Welfare. 2004. *Guidelines on Dietary Management for People Living with HIV and AIDS*. Harare, Zimbabwe: Ministry of Health and Child Welfare.

ANNEX II: CARING FOR SYMPTOMS AND ILLNESSES ASSOCIATED WITH HIV IN ADULTS

Illness	Diet	Care Practices
ANOREXIA (APPETITE LOSS)	<ul style="list-style-type: none"> • Try to stimulate appetite by eating favorite foods. • Eat small amounts of food more frequently. • Select foods that are more energy dense. • Avoid strong smelling foods. 	<ul style="list-style-type: none"> • If loss of appetite is due to illness, seek medical treatment.
DIARRHEA	<ul style="list-style-type: none"> • Drink lots of fluids to avoid dehydration (e.g., soups, diluted fruit juices, boiled water, herbal teas). • Drink juices such as passion fruit; avoid strong citrus (e.g., orange, lemon) because it may irritate the stomach. • Consume foods rich in soluble fiber to help to retain fluids (e.g., millet, banana, peas, and lentils). • Eat starchy foods like rice, maize, sorghum, bread, potato, cassava, and blended foods like corn-soy blend (CSB). • For protein, eat eggs, meat, chicken, or fish. • Boil or steam foods. • Consume fermented foods like porridges and yogurt. • Eat small amounts of food frequently and continue to eat following illness to recuperate from weight and nutrient loss. • Eat soft fruits and vegetables like bananas, squash, banana matoke, mashed sweet potato, and mashed carrots. <p><i>Foods to avoid/reduce intake:</i></p> <ul style="list-style-type: none"> • Some dairy products, such as milk, if lactose intolerant. • Caffeine (e.g., coffee, teas) and alcohol. • Fatty foods including fried foods and extra oil, lard or butter. • Gas-forming food such as cabbage, onions, and carbonated soft drinks (e.g., sodas). 	<p><i>Prevention:</i></p> <ul style="list-style-type: none"> • Drink plenty of clean, boiled water. • Wash hands with soap and water before handling, preparing, serving, or storing foods. • Wash hands with soap and water after using a toilet or latrine or cleaning a child after defecation. <p><i>Treatment:</i></p> <ul style="list-style-type: none"> • Drink more fluids to prevent dehydration. Prepare rehydration solutions using oral rehydration salt packets or a home-made solution of one liter of boiled water, four teaspoons sugar, and a half teaspoon of iodized salt. • Go to a health center if symptoms such as severe dehydration persist (e.g., low or no urine output, fainting, dizziness, shortness of breath, bloody stools, high fever, vomiting, severe abdominal pain, or diarrhea).
FEVER	<ul style="list-style-type: none"> • Eat soups that are rich in foods that give energy and nutrients, like maize, potatoes, and carrots. • Drink plenty of liquids, more than usual beyond thirst. 	<ul style="list-style-type: none"> • Bathe in cool water. • Rest. • Continue to eat small frequent meals, as tolerated. • Go to the health center in case of fever that lasts several days and is not relieved with aspirin; loss of consciousness; severe body pain; yellow eyes; severe diarrhea; and fits.

Illness	Diet	Care Practices
NAUSEA AND VOMITING	<ul style="list-style-type: none"> • Eat small and frequent meals. • Eat foods like soups, unsweetened porridge, and fruits like bananas. • Eat lightly salted and dry foods like crackers to calm the stomach. • Drink liquids, such as clean boiled water. • Avoid spicy and fatty foods. • Avoid caffeine (e.g., coffee, tea) and alcohol. • Avoid overly sweet foods. 	<ul style="list-style-type: none"> • Avoid lying down immediately after eating; wait at least 20 minutes to avoid vomiting. • Rest between meals. • Avoid having an empty stomach; nausea is worse if nothing is in the stomach. • Eat small frequent meals.
THRUSH	<ul style="list-style-type: none"> • Eat soft mashed foods, such as carrots, scrambled eggs, mashed potatoes, bananas, soups, porridge. • If available, use a spoon or cup to eat small amounts of foods. • Eat cold or room temperature foods. • Drink plenty of fluids. • Avoid spicy, salty, or sticky foods; these may irritate mouth sores. • Avoid sugary foods; these cause yeast to grow. • Avoid strong citrus fruits and juices which may irritate mouth sores. • Avoid alcohol. 	<ul style="list-style-type: none"> • Seek medical treatment. • Rinse mouth with boiled warm salt water after eating to reduce irritation and keep infected areas clean so yeast cannot grow. • Tilt head back when eating to help with swallowing.
ANEMIA	<ul style="list-style-type: none"> • Eat more iron- and folic acid-rich foods such as animal products (e.g., eggs, fish, meat, liver), green leafy vegetables (e.g., collard greens, spinach), legumes (e.g., beans, lentils, groundnuts), and fortified cereals. • Consume vitamin C-rich foods (e.g., citrus fruits, green leafy vegetables) at meal times to improve iron absorption. • Do not drink tea, coffee, milk, or cocoa at meal times; these inhibit iron absorption. • Take iron supplements as recommended by a health worker. 	<ul style="list-style-type: none"> • Seek treatment for malaria and hookworm.

Illness	Diet	Care Practices
MUSCLE WASTING	<ul style="list-style-type: none"> • Increase food intake by increasing quantity of food and frequency of consumption. • Increase protein by eating animal products, cereals, and legumes. • Improve quality and quantity of foods by providing a variety of foods. • Eat small frequent meals. • Eat soft liquid food if mouth sores are present. • Slowly introduce fat in the diet. • Increase intake of starchy foods in cereals and other staples. • Use fortified foods. 	<ul style="list-style-type: none"> • Maintain regular exercise. It is the only way to build muscles.
CONSTIPATION	<ul style="list-style-type: none"> • Drink water, juices, and nectars every day. • Eat more foods that are high in fiber content, such as maize, whole-wheat bread, green vegetables, and washed fruits with the peel remaining. • Drink plenty of liquids including boiled water. • Avoid processed or refined foods. 	<ul style="list-style-type: none"> • Maintain regular exercise.
BLOATEDNESS/ HEARTBURN	<ul style="list-style-type: none"> • Eat small, frequent meals. • Avoid gas-forming foods (e.g., cabbage, soda) and spicy foods. • Drink fluids between meals. 	<ul style="list-style-type: none"> • Eat long enough before sleeping so food can digest. • Avoid lying down immediately after eating.
TUBERCULOSIS	<ul style="list-style-type: none"> • Consume foods high in protein, energy, iron, and vitamins. 	<ul style="list-style-type: none"> • Consult medical personnel about taking food with medications. • If taking isoniazid for treatment, take a vitamin B6 supplement to avoid deficiency of this micronutrient.
LOSS OF TASTE AND/OR ABNORMAL TASTE	<ul style="list-style-type: none"> • Use flavor enhancers (e.g., salt, spices, herbs, lemon). 	<ul style="list-style-type: none"> • Chew food well and move around mouth to stimulate receptors.

Source: FANTA 2004

ANNEX III: MODERN MEDICATIONS AND SIDE EFFECTS

Medication	Purpose	Nutrition Recommendations	Food/Beverages/ Herbs to Avoid	Potential Side Effects*
Sulfonamides: Sulfamethoxazole, Cotrimoxazole (Bactrim®, Septra®)	Antibiotic for treating pneumonia and toxoplasmosis	Take with food		Nausea, vomiting, abdominal pain
Rifampin	Treatment of TB	On an empty stomach 1 hour before or 2 hours after meals	Alcohol	Nausea, vomiting, diarrhea, loss of appetite
Isoniazid	Treatment of TB	One hour before or 2 hours after meals Supplement with 10 mg vitamin B6 daily	Alcohol	Anorexia, diarrhea; may cause possible reactions with foods such as bananas, beer, avocados, liver, smoked or pickled fish, yeast, or yogurt; may interfere with vitamin B6 metabolism, therefore will require vitamin B6 supplement to prevent peripheral neuropathy and anemia
Quinine	Treatment of malaria	With food		Abdominal or stomach pain, diarrhea, nausea, vomiting, lower blood sugar
Sulfadoxine and Pyrimethamine (Fansidar®)	Treatment of malaria Pyrimethamine is also used to treat toxoplasmosis	With food and large quantities of water Supplement daily with folic acid (leucovorin), the active form of folate (5–10 mg/day)		Nausea, vomiting, taste loss and diarrhea; not recommended if folate deficient; not recommended for breastfeeding women
Chloroquine	Treatment of malaria	With food		Stomach pain, loss of appetite, nausea, vomiting; not recommended for breastfeeding women
Fluconazole	Treatment of thrush	With food		Nausea, vomiting, diarrhea; can be used during breastfeeding
Nystatin®	Treatment of thrush	With food		Infrequent occurrence of diarrhea, vomiting, nausea
Antiretroviral drugs				
Didanosine (ddl) NNRTI	Antiretroviral	Take 1 hour before or 2 hours after eating with water only	Alcohol, juice	Anorexia, diarrhea, nausea, vomiting, pain, headache, weakness, insomnia, rash, dry mouth, lost of taste, constipation, stomatitis, anemia, fever, dizziness, pancreatitis; do not take with antacid containing aluminum or magnesium
Lamivudine (3TC) NNRTI	Antiretroviral	Can be taken without regard to food	Alcohol	Nausea, vomiting, headache, dizziness, diarrhea, abdominal pain, nasal symptoms, cough, fatigue, pancreatitis, anemia, insomnia, muscle pain, and rash

Medication	Purpose	Nutrition Recommendations	Food/Beverages/Herbs to Avoid	Potential Side Effects*
Stavudine (d4T) NNRTI	Antiretroviral	Can be taken without regard to food	Limit alcohol	Nausea, vomiting, diarrhea, peripheral neuropathy, chills and fever, anorexia, stomatitis, diarrhea, anemia, headaches, rash, bone marrow, and pancreatitis
Tenofovir (TDF) NNRTI	Antiretroviral	With food	Alcohol	Abdominal pain, headache, fatigue, and dizziness
Zidovudine (AZT) NNRTI	Antiretroviral	Can be taken with food, but do not take with a high fat meal	Alcohol	Anorexia, anemia, nausea, vomiting, bone marrow suppression, headache, fatigue, constipation, fever dizziness, dyspnea, insomnia, muscle pain, rash
Efavirenz NRTI	Antiretroviral	Can be taken with food, but do not take with a high fat meal	Alcohol	Elevated blood cholesterol levels, elevated triglycerides levels, rash, dizziness, anorexia, nausea, vomiting, diarrhea, dyspepsia, abdominal pain, flatulence
Nevirapine (NVP) NRTI	Antiretroviral	Can be taken without regard to food	St John's wort	Nausea, vomiting rash, fever, headache, skin reactions, fatigue, stomatitis, abdominal pain, drowsiness, paresthesia; high hepatotoxicity
Indinavir (IDV) PI	Antiretroviral	Take the drug 1 hour before or 2 hours after meal; drink at least 1,500 mL of fluid daily	St John's wort	Nausea, abdominal pain, headache, kidney stones, taste changes, vomiting, diarrhea, insomnia, ascites, weakness, dizziness; may increase the risk of lipodystrophy; do not consume grapefruit as it may lower the level of medicine in the blood
Nelfinavir PI	Antiretroviral	Take with meal or light snack	St John's wort	Diarrhea, flatulence, nausea, abdominal pain, rash; may increase the risk of lipodystrophy
Ritonavir PI	Antiretroviral	Take with meal if possible	St John's wort	Nausea, vomiting, diarrhea, hepatitis, jaundice, weakness, anorexia, abdominal pain, fever, diabetes, headache, dizziness; may increase the risk of lipodystrophy
Saquinavir PI	Antiretroviral	Take with meal or light snack; take within 2 hours of a high fat meal and high calcium meal	Garlic supplements St John's wort	Mouth ulceration, taste changes, nausea, vomiting, abdominal pain, diarrhea, constipation, flatulence, weakness, rash, headache; may increase the risk of lipodystrophy

*Note: This list is not comprehensive. For nutritional management of side effects, see Annexes II and IV.

Source: FANTA 2004

ANNEX IV: TRADITIONAL WAYS OF DEALING WITH COMMON ILLNESSES AND SYMPTOMS OF AIDS

Illness/ Symptom	Traditional Ways of Dealing with the Illness or Symptom	When to Seek Assistance from Modern Health Services
DIARRHEA	<ul style="list-style-type: none"> • Eat fruits such as ripe bananas. • Drink the water from boiled white rice and light porridges made of maize and cassava. • Prepare rice soup. Boil 1 cup of rice in 5 to 6 cups of water and a bit of salt for 1 hour. Drink the soup while it is warm. • Drink fermented milk 3 to 4 times a day. Fermented milk does not contain lactose, a sugar that can be associated with abdominal pain during diarrhea. • Drink garlic tea. Chop 3 or 4 cloves of garlic and add to 1 cup of boiling water. Simmer for 10 minutes and then cool slightly before drinking. Drink the tea 3 to 4 times per day. 	<ul style="list-style-type: none"> • If there is blood in the stool • If diarrhea is accompanied by fever that cannot be relieved by aspirin or home treatment • If the patient is too weak to eat or very dehydrated and efforts to rehydrate are not working • If diarrhea does not go away after 2 to 3 days
FEVER	<ul style="list-style-type: none"> • Drink citrus (e.g., lemon, orange) juice several times throughout the day. • Pound lemon or orange peel with a small amount of water. Rub on the patient's back or add to bathwater before bathing. • Pound gum/eucalyptus leaves in a mortar with a small amount of cooking oil. Rub the oil onto the patient's chest. Or place a large number of gum leaves in a pot of boiling water. Leave the pot in the patient's room so the vapors can be inhaled. • Cut a fresh twig from a neem tree (i.e., <i>Azadirachta indica</i>). Remove the leaves, and have the patient chew the bark; or boil some water with the bark and have the patient drink the tea. 	<ul style="list-style-type: none"> • If fever lasts more than 3 days • If the patient is very hot or delirious • If fever is accompanied by other signs of serious illness
COUGH	<ul style="list-style-type: none"> • Crush some fresh gum tree leaves and place them in boiling water. When the water is boiling, remove the pot from the fire. Place a cloth over the person's head and lean over the pot to breathe the vapors. • Place 3 to 4 dried gum tree leaves in a cup of hot water and boil for 10 minutes. Let the tea cool slightly before drinking. The tea should be consumed 2 to 3 times a day. • Tea can also be made with lemon or guava leaves. 	<ul style="list-style-type: none"> • If the person is coughing blood or thick, bad-smelling sputum or mucous • If the cough lasts more than 2 weeks
HEADACHE	<ul style="list-style-type: none"> • Crush some lavender leaves with a little cooking oil until a paste is formed. Rub it into the temples and forehead. Also rub some dried lavender leaves in your hands and smell them frequently while you rest. • Make garlic and onion tea. Chop 2 to 3 cloves of garlic and 1/2 bulb of onion. Put the chopped garlic and onion into a cup of hot water. Allow the water to simmer for 10 minutes. After 10 minutes, let the tea cool slightly before drinking. 	<ul style="list-style-type: none"> • If the patient's neck is stiff • If the patient also has a high fever • If the headache does not go away after 2 to 3 days

Illness/ Symptom	Traditional Ways of Dealing with the Illness or Symptom	When to Seek Assistance from Modern Health Services
SORE THROAT	<ul style="list-style-type: none"> • Squeeze a whole lemon and mix with honey. Take a large spoonful as necessary. • Mix a strong solution of salt and warm water. Gargle with this solution several times a day. • Eat raw garlic or make garlic tea. Chop 3 to 4 cloves of garlic. Add chopped cloves to 1 cup of boiling water. Allow water to simmer for 10 minutes. Let it cool before drinking. Add honey or sugar to sweeten if available. 	<ul style="list-style-type: none"> • If the patient cannot swallow or breathe properly • If the patient has a fever that cannot be relieved by aspirin or home treatment • If the patient develops a rash • If the sore throat lasts more than 2 weeks
THRUSH	<ul style="list-style-type: none"> • Eat 1 to 2 cloves of raw garlic every 3 to 4 hours if available. If the raw garlic is too strong, crush the cloves and mix with a small amount of clean boiled water. Rinse the mouth with this mixture and then swallow the rest. Repeat every 3 to 4 hours. • Drink sour or fermented milk. This will help to prevent yeast from growing. • Eat green papaya or pawpaw as a relish or side dish. • Gargle with slightly salty, warm, clean water. • Avoid sweet foods and sweet drinks (e.g., carbonated soft drinks), which will increase the soreness and help the yeast to grow. Avoid sugar and honey. 	<ul style="list-style-type: none"> • When a fever is present and cannot be relieved by aspirin or home treatment • If no improvement occurs after a few days • If pain causes a complete loss of appetite

Source: FANTA 2004.

ANNEX V: FOOD SAFETY, HYGIENE, AND SANITATION TOPICS FOR HIV AND AIDS EDUCATION

Listed below are guidelines for handling water, animal products, fruits and vegetables, and general food storage, as well as some general hygiene guidelines.

Water

- Be sure water is clean. Guidance on the length of boiling time for preparation of safe water for drinking and food preparation varies from boiling water vigorously for a few seconds to 10 minutes.
- Keep boiled water stored in a clean container with a lid.
- Do not dip hands or cups into the container. Instead, pour water from the container.
- The best container is one with a tap.
- Always wash hands with soap before and after touching foods and using the latrine.

Animal Products

- Cook all animal products (i.e., meat, chicken, pork, fish, and eggs) until thoroughly cooked and well done.
- Do not eat meat that still has red juice.
- Do not eat soft-boiled eggs, raw eggs, cracked eggs, or any foods containing raw eggs.
- Thoroughly wash hands and all utensils and surfaces that have touched uncooked foods, particularly meats, before handling other foods.
- Cover meat, poultry, and fish with a clear cover or cloth. Keep meat, poultry, and fish separate from other foods to avoid contamination with bacteria and other disease-causing agents.

Fruits and Vegetables

- Use boiled, clean water to thoroughly wash all fruits and vegetables that are to be eaten raw.
- If it is not possible to wash fruits and vegetables properly, remove the skin to avoid contamination.
- Remove the bruised parts of fruits and vegetables to remove any molds and bacteria growing there.
- Boil thoroughly, but do not overcook vegetables as vitamins will get lost.

General Foods Storage and Handling

- Make sure that all food preparation and consumption areas are free of flies and other insects.
- Keep all food preparation surfaces clean.
- Use clean dishes and utensils to store, prepare, and eat food.
- Cover and store food in containers to avoid contamination.
- Keep hot foods hot and cold foods cold before eating.
- Throw away foods that have gone bad or are well past the “sell-by” or expiration date.
- Avoid storing leftovers unless they can be kept in a cool place or refrigerator. Always re-heat them at a high temperature. Always boil leftovers for at least five minutes before eating.
- Do not store raw food, especially meat, close to cooked food.
- Store food in a cool, dry place or refrigerator.
- Be very careful about eating prepared foods purchased from vendors in the marketplace.

General Hygiene

- Always wash hands with clean water and soap or ashes before, during, and after preparing food, before eating, or after visiting the latrine.
- Cover all wounds to prevent contamination of food during preparation and handling.
- Use a latrine and keep it clean and free from flies.
- Keep the areas surrounding latrines and food preparation and eating areas clean.
- Wash clothes, bedding, and surfaces that might have been contaminated with feces in hot water and soap.

Source: FANTA 2004.

ANNEX VI: RECOMMENDED WEIGHT GAIN DURING PREGNANCY

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Pre-pregnancy category BMI	Recommended total gain (kg)	Recommended weekly weight gain, second and third trimesters
BMI less than 19.8	12.5 to 18.0	slightly more than 0.5 kg
BMI 19.8 to 25.9	11.5 to 16.0	0.5 kg
BMI 26.0 to 29.0	7.0 to 11.5	0.3 kg
BMI more than 29.0	less than 7	0.3 kg

Source: IOM 1990.

ANNEX VII: DEFINITION OF AFASS: ACCEPTABLE, FEASIBLE, AFFORDABLE, SUSTAINABLE, AND SAFE

ACCEPTABLE: The mother perceives no barrier to replacement feeding. Barriers may have cultural or social reasons, or be due to fear of stigma or discrimination. The mother is under no social or cultural pressure not to use replacement feeding. She is supported by family and community in opting for replacement feeding, or she will be able to cope with pressure from family and friends to breastfeed, and she can deal with possible stigma attached to being seen with replacement food.

FEASIBLE: The mother or family has adequate time, knowledge, skills, and other resources to prepare the replacement food and feed the infant up to 12 times in 24 hours. The mother can understand and follow the instructions for preparing infant formula and, with support from the family, can prepare enough replacement feeds correctly every day and at night, despite disruptions to preparation of family food or other work.

AFFORDABLE: The mother and family, with community or health-system support if necessary, can pay the cost of purchasing/producing, preparing, and using replacement feeding, including all ingredients, fuel, clean water, soap, and equipment, without compromising the health and nutrition of the family. This concept also includes access to medical care for diarrhea, if necessary, and the ability to cover the cost of such care.

SUSTAINABLE: Availability of a continuous and uninterrupted supply and a dependable system of distribution for all ingredients and products needed for safe replacement feeding for as long as the infant needs it, up to one year of age or longer. There is little risk that formula will ever be unavailable or inaccessible, and another person is available to feed the child in the mother's absence and can prepare and give replacement foods.

SAFE: Replacement foods are correctly and hygienically prepared and stored and fed in nutritionally adequate quantities, with clean hands, and using clean utensils, preferably by cup. This concept means that the mother or caregiver:

- Has access to a reliable supply of safe water (e.g., from a piped or protected-well source);
- Prepares replacement feeds that are nutritionally sound and free of pathogens;
- Is able to wash hands and utensils thoroughly with soap and to regularly boil the utensils to sterilize them;
- Can boil water for preparing each of the baby's feeds; and
- Can store unprepared feeds in clean, covered containers and protect them from rodents, insects, and other animals.

Source: Piwoz, E. 2004b.

ANNEX VIII: EXAMPLES OF FOOD ASSISTANCE INTEGRATED INTO HIV AND AIDS PROGRAMS

Activity	Objective	Beneficiary entry criteria	Entry Points	Food and Other Resources Required
Therapeutic feeding (inpatient facilities or support to community-based therapeutic feeding programs)	Nutritional rehabilitation of severely malnourished children (including OVCs) and adults living with HIV, according to standard WHO nutritional protocols for treatment of severe malnutrition	CHILDREN: Weight/height < 3 SD or < 70 percent median ADULTS: Weight loss greater than 10 percent of body weight; or mid-upper arm circumference (MUAC) \leq 160 mm irrespective of clinical signs; or MUAC 161–185 mm plus WHO Stage 2 or 3 criteria	PMTCT, VCT, ART, home-based and palliative care	Training and ongoing nutritional assessment Logistics Technical assistance for program supervision Therapeutic foods (e.g. F100, F75 therapeutic milk, Plumpynut®)
Supplementary feeding (in outpatient facilities)	Nutritional rehabilitation of moderately malnourished children (including OVC) and adults living with HIV, according to standard WHO nutritional and medical protocols	CHILDREN: Weight/height < 2 SD or 70–80 percent median ADULTS: Weight loss greater than 10 percent of body weight; or MUAC 161–185 mm; PREGNANT AND LACTATING WOMEN: Nutritional deterioration or failure to gain weight despite ART and/or treatment of infections in any of the above groups	PMTCT, VCT, ART, home-based and palliative care	Training and ongoing nutritional technical assistance for program supervision Supplementary foods (e.g. CSB, oil, other locally produced foods)
Supplementary feeding (in outpatient facilities)	To provide incentive for regular follow-up attendance for those PLHIVs not yet qualifying for ART	CD4 count 200–500 / cumm	ART	Training and ongoing nutritional technical assistance for program supervision Supplementary foods (e.g. CSB, oil, other locally produced foods)
'Preventative' care package	Improve participation and symptom management	Participants receiving insecticide-treated bednets (ITNs), safe water systems, and co-trimoxazole. These are not screening criteria.	Home-based and palliative care	Training and technical assistance and nutritional commodities (e.g. CSB, oil, other locally produced foods)

Source: FANTA 2004.

ANNEX IX: EXAMPLES OF THE USES OF FOOD AID TO SUPPORT HIV-AFFECTED POPULATIONS

Target Group	Uses of Food
TREATMENT	
PLHIVs, including children	<ul style="list-style-type: none"> Food to improve adherence to ART Food to improve treatment efficacy Food to help manage drug side effects
PREVENTION	
PLHIVs and household members	<ul style="list-style-type: none"> Food as an income transfer and asset protection Food to prevent or reduce high-risk behaviors or reliance on negative coping strategies Food as an incentive for voluntary testing and counseling Food as an incentive for participation in PMTCT and PMTCT+
Communities in high-prevalence or high-risk areas	<ul style="list-style-type: none"> Food as incentive to participate in HIV awareness and behavior change programs Food as an income transfer and asset protection and to prevent or reduce high-risk behaviors or reliance on negative coping strategies
CARE AND SUPPORT	
PLHIVs	<ul style="list-style-type: none"> Food to supplement daily nutritional requirements and special dietary needs, such as increased energy requirements Food to support nutritional management of symptoms of opportunistic infections (e.g., anorexia, diarrhea, nausea) Food for use in hospitals and hospices as a part of palliative care Food to provide safety net and income transfers Food as an income transfer and asset protection Food for training in life skills, life planning, alternative livelihood strategies
Affected households and OVCs	<ul style="list-style-type: none"> Food to supplement daily nutritional requirements of OVCs and other affected household members Food to provide safety net and income transfer for affected households and guardians Food for education as a nutritional supplement, income transfer, and guardianship incentive Food as an income transfer and asset protection Food as an income transfer to encourage school attendance Food for training in life skills, life planning, alternative livelihood strategies Food as a bridge for adopting new technologies and practices or establishing new livelihood strategies
OVCs in institutions	<ul style="list-style-type: none"> Food to supplement daily nutritional requirements Food as an income transfer to assist with costs of care, free up cash resources for provision of other critical services, and facilitate school and training program attendance
Street children	<ul style="list-style-type: none"> Food to supplement daily nutritional requirements Food to encourage attendance at skills training or counseling sessions
Communities in high prevalence or high-risk areas	<ul style="list-style-type: none"> Food as an income transfer or to cover opportunity costs to voluntary care providers Food for training voluntary care providers Food as a bridge for establishing community-based social safety nets (e.g., food banks) and care and support services Food as an income transfer and asset protection and to prevent or reduce high-risk behaviors or reliance on negative coping strategies

Source: FANTA 2004.

ANNEX X: WHO CONSULTATION ON NUTRITION AND HIV/AIDS IN AFRICA

PARTICIPANTS' STATEMENT

DURBAN, SOUTH AFRICA, 10-13 APRIL 2005

1. HIV/AIDS is affecting more people in eastern and southern Africa than the fragile health systems of the countries afflicted can treat, demoralizing more children than our educational systems can inspire, creating more orphans than communities can care for, wasting families and threatening food systems. The HIV/AIDS epidemic is increasingly driven by and contributes to factors that also create malnutrition — in particular, poverty, emergencies and inequalities.
2. In urgent response to this situation, we call for the integration of nutrition into the essential package of care, treatment and support for people living with HIV/AIDS and efforts to prevent infection.
3. We, the representatives of 20 countries in eastern and southern Africa and other participants, from organizations in the United Nations system, bilateral agencies, regional groups, nongovernmental organizations, academe and other bodies, *recognize that*
 - (1) far-reaching steps need to be taken to reverse current trends in malnutrition, HIV infection and food insecurity in most countries in the region, in order to achieve the Millennium Development Goals;
 - (2) adequate nutrition cannot cure HIV infection but is essential to maintain a person's immune system, to sustain healthy levels of physical activity, and for optimal quality of life;
 - (3) adequate nutrition is also necessary to ensure optimal benefits from the use of antiretroviral treatment, which is essential to prolong the lives of HIV-infected people and prevent transmission of HIV from mother to child;
 - (4) there is a proliferation in the marketplace of unproven diets and dietary therapies, with exploitation of fears, raising of false hopes and further impoverishment of those infected and affected by HIV and AIDS;
 - (5) exceptional measures are needed to ensure the health and well-being of all children affected and made vulnerable by HIV/AIDS, with young girls especially at risk;
 - (6) knowledge of HIV status is important to inform choices for reproductive health and child feeding.

Conclusions

4. After reviewing the scientific evidence and having discussed the programmatic experience on nutrition and HIV/AIDS, *we come to the following conclusions.*

MACRONUTRIENTS

- HIV-infected adults and children have greater energy needs than uninfected adults and children. Energy needs increase by 10% in asymptomatic HIV-infected adults and children, and, in adults with more advanced disease, by 20% to 30%. For HIV-infected children experiencing weight loss, energy needs are increased by between 50% and 100%.
- There is no evidence to support a need for increased protein intake by people infected by HIV over and above that required in a balanced diet to satisfy energy needs (12% to 15% of total energy intake).
- Loss of appetite and poor dietary intake are important causes of weight loss associated with HIV infection. Effective ways of improving dietary intakes need to be developed and documented.

MICRONUTRIENTS

5. Micronutrient deficiencies are frequently present in HIV-infected adults and children.

- Micronutrient intakes at daily recommended levels need to be assured in HIV-infected adults and children through consumption of diversified diets, fortified foods, and micronutrient supplements as needed.
- WHO's recommendations on vitamin A, zinc, iron, folate and multiple micronutrient supplements remain the same.
- Micronutrient supplements are not an alternative to comprehensive HIV treatment including therapy with antiretroviral agents.
- More studies are needed to understand better the relationship between micronutrient supplementation and potential health benefits for people infected with HIV.

PREGNANCY AND LACTATION

- Pregnancy and lactation do not hasten the progression of HIV infection to AIDS.
- Optimal nutrition of HIV-infected women during pregnancy and lactation increases weight gain, and improves pregnancy and birth outcomes.
- HIV-infected pregnant women gain less weight and experience more frequent micronutrient deficiencies than uninfected pregnant women.

GROWTH

- HIV infection impairs the growth of children early in life. Growth faltering is often observed even before the onset of symptomatic HIV infection. Poor growth is associated with increased risk of mortality.
- Viral load, chronic diarrhoea and opportunistic infections impair growth in HIV-infected children. The growth and survival of HIV-infected children are improved by prophylactic use of cotrimoxazole, antiretroviral therapy, and early prevention and treatment of opportunistic infections.
- Improved dietary intake is essential to enable children to regain lost weight after opportunistic infection.

INFANT AND YOUNG CHILD FEEDING

- For HIV-uninfected mothers and mothers who do not know their HIV status, exclusive breastfeeding for six months is the ideal practice because of its benefits for improved growth, development and reduced incidence of childhood infections. Safe and appropriate complementary feeding and continued breastfeeding for 24 months and beyond are recommended.
- The risk of transmission of HIV through breast milk is constant throughout the period of breastfeeding and is greatest among women newly infected or with advanced HIV disease.
- Exclusive breastfeeding is less associated with HIV transmission than mixed breastfeeding.
- WHO and UNICEF recommend that HIV-infected mothers should avoid breastfeeding when replacement feeding is acceptable, feasible, affordable, sustainable and safe. These conditions, however, are not easily met for most mothers in the region.
- The safety of infant feeding can be improved with adequate support, but health systems and communities are not providing this support.

- Early cessation of breastfeeding is recommended for HIV-infected mothers and their infants. The age at which to stop breastfeeding depends on the individual circumstances of mothers and their infants. The consequences of early cessation on transmission, mortality, growth and development need to be urgently studied. There is an immediate need to evaluate suitable ways of meeting nutritional needs of infants and young children who are no longer breastfed.

INTERACTION BETWEEN NUTRITION AND ANTIRETROVIRAL TREATMENT

- The life-saving benefits of antiretroviral therapy are clearly recognized. To achieve the full benefits of such treatment, adequate dietary intake is essential.
- Dietary and nutritional assessment is an essential part of comprehensive HIV care both before and during antiretroviral treatment.
- Long-term use of antiretroviral agents can be associated with metabolic complications (e.g., cardiovascular disease, diabetes and bone related problems). Although, the value of antiretroviral therapy far outweighs the risks, the metabolic complications need to be adequately managed. The challenge is how best to apply in Africa the extensive clinical experience in managing these types of metabolic disorders in HIV-infected adults and children.
- Interactions between nutritional status and antiretroviral treatment in chronically malnourished populations, severely malnourished children, and pregnant and lactating women need to be investigated.
- The effects of traditional remedies and dietary supplements on the safety and efficacy of antiretroviral agents need to be evaluated.

Recommendations for action

- 6.** Based on the foregoing scientific conclusions, we urge all concerned parties to make nutrition an integral part of their response to HIV/AIDS. We make the following recommendations for immediate implementation at all levels.

(1) STRENGTHEN POLITICAL COMMITMENT AND IMPROVE THE POSITIONING OF NUTRITION IN NATIONAL POLICIES AND PROGRAMMES

- Use existing, and develop new, advocacy tools to sensitize decision-makers to the urgency of the problem, the consequences on development targets of neglecting the role of nutrition and not including it within the overall care and support package and the opportunity to improve care.
- Advocate increased resource allocation and support for improved nutrition, in general, and tackling the nutritional needs of HIV-affected and infected populations.
- Prioritize the needs of children affected and made vulnerable by HIV/AIDS.
- Clarify and improve multisectoral collaboration and coordination between the agricultural, health, social services, education and nutrition sectors.

(2) DEVELOP PRACTICAL TOOLS AND GUIDELINES FOR NUTRITIONAL ASSESSMENT FOR HOME, COMMUNITY, HEALTH FACILITY-BASED AND EMERGENCY PROGRAMMES

- Validate simple tools to assess diet and use of supplements, including traditional and alternative therapies, nutritional status, and food security so that nutrition support provided within HIV programmes is appropriate to individual needs.

- Develop standard and specific guidelines for nutritional care of individuals, and implementation of programmes at health-facility and community levels.
- Review and update existing guidelines to include considerations of nutrition and HIV (e.g., guidelines on integrated management of adolescent and adult illness, antiretroviral treatment, and nutrition in emergencies).

(3) EXPAND EXISTING INTERVENTIONS FOR IMPROVING NUTRITION IN THE CONTEXT OF HIV

- Accelerate the implementation of the Global strategy for infant and young child feeding.
- Renew support for the Baby-friendly Hospital Initiative.
- Accelerate the fortification of staple foods with essential micronutrients.
- Implement WHO protocols for vitamin A, iron, folate, zinc and multiple micronutrient supplementation and management of severe malnutrition.
- Accelerate training on, and use of guidelines and tools for, infant feeding counselling and maternal nutrition in programmes to prevent mother-to-child transmission of HIV.
- Expand access to HIV counselling and testing so that individuals can make informed decisions and receive appropriate advice and support on nutrition, including in emergency settings.

(4) CONDUCT SYSTEMATIC OPERATIONAL AND CLINICAL RESEARCH TO SUPPORT EVIDENCE-BASED PROGRAMMING

- Develop and implement operational and clinical research to identify effective interventions and strategies for improving nutrition of HIV-infected and affected adults and children.
- Document and publish results and ensure access to lessons learned at all levels.
- Encourage scientific journals to give greater opportunity for publication of operational research and records of good practice.

(5) STRENGTHEN, DEVELOP AND PROTECT HUMAN CAPACITY AND SKILLS.

- Include funding for nutrition capacity development in plans for expanded treatment and care of people living with HIV and those affected by HIV/AIDS.
- Incorporate nutrition into training, including pre-service training, of health, community and home-based care workers, with development of specific skills such as nutritional assessment and counselling, and programme monitoring and evaluation. Such training should not favour particular commercial interests.
- Strengthen the capacity of government and civil society to develop and monitor regulatory systems to prevent commercial marketing of untested diets, remedies, and therapies for HIV-infected adults and children.
- Improve the conditions of service and coverage of health workers, especially dietitians and nutritionists, to deliver nutritional services.
- Identify and use local expertise to improve response to emergency conditions.

(6) INCORPORATE NUTRITION INDICATORS INTO HIV/AIDS MONITORING AND EVALUATION PLANS

- Include appropriate indicators for measuring progress towards integrating nutrition into HIV programmes and the impact of nutritional interventions in reporting the results of clinical and community-level surveillance and reporting of progress at national, regional and international levels.

GLOSSARY

ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS): The most severe manifestation of infection with the Human Immunodeficiency Virus (HIV). The Centers for Disease Control and Prevention (CDC) lists numerous opportunistic infections and cancers that, in the presence of HIV infection, constitute an AIDS diagnosis. In 1993, CDC expanded the criteria for an AIDS diagnosis in adults and adolescents to include CD4+ T cell count at or below 200 cells per microliter in the presence of HIV infection. In persons (age 5 and older) with normally functioning immune systems, CD4+ T cell counts usually range from 500–1,500 cells per microliter. Persons living with AIDS often have infections of the lungs, brain, eyes, and other organs, and frequently suffer debilitating weight loss, diarrhea, and a type of cancer called Kaposi's Sarcoma.

ADHERENCE: Compliance with a drug regimen, as in taking medications correctly and on time. It encompasses the patient's active participation in his or her own healthcare, seeking medical advice, keeping appointments, following recommendations concerning lifestyle, as well as following medical regimens.

AIDS: See Acquired Immune Deficiency Syndrome.

ANEMIA: A lower than normal number of red blood cells.

ANOREXIA: The lack or loss of appetite that leads to significant decline in weight.

ANTIBODY: A protein that is manufactured by lymphocytes (a type of white blood cell) to neutralize an antigen or foreign protein. Bacteria, viruses, and other microorganisms commonly contain many antigens.

ANTIRETROVIRAL DRUGS (ARV): Substances used to kill or inhibit the multiplication of retroviruses such as HIV.

ANTIVIRAL: A substance or process that destroys a virus or suppresses its replication (i.e., reproduction).

ARV: See Antiretroviral Drugs.

ART: Antiretroviral therapy.

ASYMPTOMATIC: Without symptoms. Usually used in the HIV/AIDS literature to describe a person who has a positive reaction to one of several tests for HIV antibodies but who shows no clinical symptoms of the disease.

BIOAVAILABILITY: The extent to which an oral medication is absorbed in the digestive tract and reaches the bloodstream, thereby permitting access to the site of action.

BODY FLUIDS: Any fluid in the human body, such as blood, urine, saliva (spit), sputum, tears, semen, mother's milk, or vaginal secretions. Only blood, semen, mother's milk, and vaginal secretions have been linked directly to the transmission of HIV.

BODY MASS INDEX (BMI): A measure of body fat based on height and weight that applies to both adult men and women.

BONE MARROW: Soft tissue located in the cavities of the bones where blood cells such as erythrocytes, leukocytes, and platelets are formed.

BONE MARROW SUPPRESSION: A side effect of many anticancer and antiviral drugs, including AZT. Leads to a decrease in white blood cells, red blood cells, and platelets. Such reductions in turn result in anemia, bacterial infections, and spontaneous or excess bleeding.

BREAST MILK SUBSTITUTE: Any food being marketed or otherwise represented as a partial or total replacement for breast-milk, whether or not suitable for that purpose.

CANDIDA: Yeast-like fungi commonly found in the normal flora of the mouth, skin, intestinal tract, and vagina, which can become clinically infectious in immune-compromised persons.

CANDIDIASIS: An infection with a yeast-like fungus of the Candida family, generally Candida albicans. Candidiasis of the esophagus, trachea, bronchi, or lungs is an indicator disease for AIDS. Oral or recurrent vaginal candida infection is an early sign of immune system deterioration.

CD4 (T4) OR CD4+ CELLS: A type of T cell involved in protecting against viral, fungal, and protozoal infections. These cells normally orchestrate the immune response, signaling other cells in the immune system to perform their special functions. Also known as T helper cells. HIV's preferred targets are cells that have a docking molecule called "cluster designation 4" (CD4) on their surfaces. Cells with this molecule are known as CD4-positive (or CD4+) cells. Destruction of CD4+ lymphocytes is the major cause of the immune deficiency observed in AIDS, and decreasing CD4+ lymphocyte levels appear to be the best indicator for developing opportunistic infections. Although CD4 counts fall, the total T cell level remains fairly constant through the course of HIV disease, due to a concomitant increase in the CD8+ cells. The ratio of CD4+ to CD8+ cells is therefore an important measure of disease progression.

COINFECTION: The infection of HIV/AIDS simultaneously with another disease, usually hepatitis.

COMBINATION THERAPY: Two or more drugs or treatments used together to achieve optimum results against HIV infection and/or AIDS. Combination drug therapy has proven more effective in decreasing viral load than monotherapy (single-drug therapy). An example of combination therapy would be the use of two nucleoside analog drugs plus either a protease inhibitor or a non-nucleoside reverse transcription inhibitor.

CORN-SOY BLEND (CSB): A naturally wholesome blended food containing 69.5 percent cornmeal, 21.8 percent soy flour, a premix of 3.0 percent minerals and vitamin antioxidant, and 5.5 percent soy oil. It is highly nutritious and precooked for ease in use and handling.

DIABETES MELLITUS (DM): A disorder of carbohydrate metabolism characterized by elevated blood glucose (blood sugar) levels and glucose in the urine resulting from inadequate production or use of insulin. Insulin is the hormone that allows glucose to leave the bloodstream and enter body cells, where it is used for energy generation or stored for future use. Diabetes mellitus can also lead to long-term complications that include the development of neuropathy (swelling and wasting of the nerves), retinopathy (non-swelling eye disorder), nephropathy (swelling or breakdown disorder of the kidneys), generalized degenerative changes in large and small blood vessels, and increased susceptibility to infections.

DIARRHEA: Uncontrolled, loose, and frequent bowel movements caused by diet, infection, medication, and irritation or inflammation of the intestine. Severe or prolonged diarrhea can lead to weight loss and malnutrition. The excessive loss of fluid that may occur with AIDS-related diarrhea can be life threatening. There are many possible causes of diarrhea in persons who have AIDS. Other bacteria and parasites that cause diarrhea symptoms in otherwise healthy people may cause more severe, prolonged, or recurrent diarrhea in persons with HIV or AIDS.

DRUG-DRUG INTERACTION: A modification of the effect of a drug when administered with another drug. The effect may be an increase or a decrease in the action of either substance, or it may be an adverse effect that is not normally associated with either drug.

FEVER: A rise of body temperature above the normal (98 degrees Fahrenheit).

FOOD-DRUG INTERACTION: When food affects the ingredients in a medication, preventing the medicine from working the way it should. Some nutrients can affect the way certain drugs metabolize by binding with drug ingredients, thus reducing their absorption or speeding their elimination. Taking medications at the same time as eating may interfere with the stomach and intestines' absorption of medications.

FOOD SECURITY: When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life. To be food secure, households and individuals need to have available food, access to food, and the ability to fully utilize it once it is consumed.

FORTIFIED FOODS: The addition of nutrients to foods for the purpose of ensuring the nutritional equivalence of substitute foods.

HEPATITIS: An inflammation of the liver that may be caused by several agents, including viruses and toxins. Hepatitis is characterized by jaundice, enlarged liver, fever, fatigue and abnormal liver function tests.

HIV DISEASE: During the initial infection with HIV, when the virus comes in contact with the mucosal surface and finds susceptible T cells, the first site at which there is truly massive production of the virus is lymphoid tissue. This leads to a burst of massive viremia, with wide dissemination of the virus to lymphoid organs. The resulting immune response to suppress the virus is only partially successful and some viruses escape. Eventually, this results in high viral

turnover that leads to destruction of the immune system. HIV disease is, therefore, characterized by a gradual deterioration of immune functions. During the course of infection, crucial immune cells, called CD4+ T cells, are disabled and killed, and their numbers progressively decline.

HIV VIRAL LOAD: See Viral Load Test.

HOOKWORM: A parasitic blood-sucking roundworm that has hooked mouth parts to fasten to the intestinal wall.

HUMAN IMMUNODEFICIENCY VIRUS: The retrovirus isolated and recognized as the etiologic (i.e., causing or contributing to the cause of a disease) agent of AIDS. HIV is classified as a lentivirus in a subgroup of retroviruses. The genetic material of a retrovirus such as HIV is the RNA itself. HIV inserts its own RNA into the host cell's DNA, preventing the host cell from carrying out its natural functions and turning it into an HIV factory.

IMMUNE DEFICIENCY: A breakdown or inability of certain parts of the immune system to function, thus making a person susceptible to certain diseases that they would not ordinarily develop.

INFECTION: The state or condition in which the body (or part of the body) is invaded by an infectious agent (e.g., a bacterium, fungus, or virus), which multiplies and produces an injurious effect (active infection). As related to HIV: Infection typically begins when HIV encounters a CD4+ cell. The HIV surface protein gp120 binds tightly to the CD4 molecule on the cell's surface. The membranes of the virus and the cell fuse, a process governed by gp41, another surface protein. The viral core, containing HIV's RNA, proteins, and enzymes, is released into the cell.

INTERACTION: See Drug-Drug Interaction.

LESION: A general term to describe an area of altered tissue (e.g., the infected patch or sore in a skin disease). Nipple lesions can increase the chances of HIV transmission from infected mother to child during breastfeeding.

LIPID: Any of a group of fats and fatlike compounds, including sterols, fatty acids, and many other substances.

LIPODYSTROPHY: A disturbance in the way the body produces, uses, and distributes fat. Lipodystrophy is also referred to as buffalo hump, protease paunch, or Crixivan potbelly. In HIV disease, lipodystrophy has come to refer to a group of symptoms that seem to be related to the use of protease inhibitor and NRTI drugs. How protease inhibitors and NRTIs may cause or trigger lipodystrophy is not yet known. Lipodystrophy symptoms involve the loss of the thin layer of fat under the skin, making veins seem to protrude; wasting of the face and limbs; and the accumulation of fat on the abdomen (both under the skin and within the abdominal cavity) or between the shoulder blades. Women may also experience narrowing of the hips and enlargement of the breasts. Hyperlipidemia and insulin resistance are frequently associated with lipodystrophy. Also called lipodystrophy syndrome, pseudo-Cushing's syndrome.

LOW BIRTH WEIGHT (LBW): Infant birth weight of under 2,500 g. A sensitive measure of mother's health and nutrition during pregnancy and before. The lower an infant's birth weight below 2,500 g., the greater the infant's vulnerability to infections and other problems and the greater the risk of sickness and death.

MALABSORPTION SYNDROME: Decreased intestinal absorption resulting in loss of appetite, muscle pain, and weight loss. See AIDS Wasting Syndrome.

MALARIA: An infective disease caused by sporozoan parasites that are transmitted through the bite of an infected *Anopheles* mosquito; marked by paroxysms of chills and fever.

MASTITIS: An infection of the breast. It usually only occurs in women who are breastfeeding their babies. In the process, unaccustomed to the vigorous pull and tug of the infant's suck, the nipples may become sore, cracked, or slightly abraded. This creates a tiny opening in the breast, through which bacteria can enter. The presence of milk, with high sugar content, gives the bacteria an excellent source of nutrition. Under these conditions, the bacteria are able to multiply, until they are plentiful enough to cause an infection within the breast. Mastitis usually begins more than two to four weeks after delivery of the baby. Mastitis may increase the chances of HIV transmission from infected mother to child during breastfeeding.

METABOLISM: The chemical changes in living cells by which energy is provided for vital processes and activities and new material is assimilated.

MORBIDITY: The condition of being diseased or sick; also the incidence of disease or rate of sickness.

NAUSEA: A stomach distress with distaste for food and an urge to vomit.

NON-NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS (NNRTI): A group of structurally diverse compounds that bind to the catalytic site of HIV-1's reverse transcriptase. They are quite specific; unlike the nucleoside reverse transcriptase inhibitors, the NNRTIs have no activity against HIV-2. As noncompetitive inhibitors of reverse transcriptase, their antiviral activity is additive or synergistic with most other antiretroviral agents. However drug-drug interactions may dictate dosage adjustments with protease inhibitors.

NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITOR (NRTI): A nucleoside analog antiretroviral drug whose chemical structure constitutes a modified version of a natural nucleoside. These compounds suppress replication of retroviruses by interfering with the reverse transcriptase enzyme. The nucleoside analogs cause premature termination of the proviral (viral precursor) DNA chain. All NRTIs require phosphorylation in the host's cells prior to their incorporation into the viral DNA.

OPPORTUNISTIC INFECTIONS: Illnesses caused by various organisms, some of which usually do not cause disease in persons with normal immune systems. Persons living with advanced HIV infection suffer opportunistic infections of the lungs, brain, eyes, and

other organs. Opportunistic infections common in persons diagnosed with AIDS include Pneumocystis carinii pneumonia; Kaposi's Sarcoma; cryptosporidiosis; histoplasmosis; other parasitic, viral, and fungal infections; and some types of cancers.

OSTEOPOROSIS: The loss of bony tissue, resulting in bones that become brittle and liable to fracture. Infection, injury, and synovitis (inflammation of the membrane surrounding a joint), as well as prolonged exposure to microgravity, can cause osteoporosis.

PALLIATIVE: A treatment that provides symptomatic relief but not a cure.

PALLIATIVE CARE: Palliative care is an approach to life-threatening chronic illnesses, especially at the end of life. Palliative care combines active and compassionate therapies to comfort and support patients and their families who are living with life-ending illness. Palliative care strives to meet physical needs through pain relief and maintaining quality of life while emphasizing the patient's and family's rights to participate in informed discussion and to make choices. This patient- and family-centered approach uses the skills of interdisciplinary team members to provide a comprehensive continuum of care including spiritual and emotional needs.

PNEUMONIA (PNEUMOCYSTIS CARINII PNEUMONIA): An infection of the lungs caused by Pneumocystis carinii, which is thought to be a protozoa but may be more closely related to a fungus. P. carinii grows rapidly in the lungs of persons with AIDS and is a frequent AIDS-related cause of death. P. carinii infection sometimes may occur elsewhere in the body (skin, eye, spleen, liver, or heart).

PROTEASE: An enzyme that breaks down proteins into their component peptides. HIV's protease enzyme breaks apart long strands of viral protein into the separate proteins making up the viral core. The enzyme acts as new virus particles are budding off a cell membrane. Protease is the first HIV protein whose three-dimensional structure has been characterized.

PROTEASE INHIBITORS (PI): Antiviral drugs that act by inhibiting the virus' protease enzyme, thereby preventing viral replication. Specifically, these drugs block the protease enzyme from breaking apart long strands of viral proteins to make the smaller, active HIV proteins that comprise the virion. If the larger HIV proteins are not broken apart, they cannot assemble themselves into new functional HIV particles.

RESISTANCE: Reduction in a pathogen's sensitivity to a particular drug. Resistance is thought to result usually from a genetic mutation. In HIV, such mutations can change the structure of viral enzymes and proteins so that an antiviral drug can no longer bind with them as well as it used to. Resistance detected by searching a pathogen's genetic makeup for mutations thought to confer lower susceptibility is called "genotypic resistance." Resistance that is found by successfully growing laboratory cultures of the pathogen in the presence of a drug is called "phenotypic resistance."

RETROVIRUS: A type of virus that, when not infecting a cell, stores its genetic information on a single-stranded RNA molecule instead of the more usual double-stranded DNA. HIV is an example of a retrovirus. After a retrovirus penetrates a cell, it constructs a DNA version of its genes using a special enzyme called reverse transcriptase. This DNA then becomes part of the cell's genetic material.

SECONDARY INFECTION: An infection that occurs during or after treatment of a primary infection. It may result from the treatment itself or from alterations in the immune system.

SEROCONVERSION: The development of antibodies to a particular antigen. When people develop antibodies to HIV, they seroconvert from antibody-negative to antibody-positive. It may take from as little as 1 week to several months or more after infection with HIV for antibodies to the virus to develop. After antibodies to HIV appear in the blood, a person should test positive on antibody tests.

SEXUALLY TRANSMITTED DISEASE (STD): Also called venereal disease (VD) (an older public health term) or sexually transmitted infections (STIs). Sexually transmitted diseases are infections spread by the transfer of organisms from person to person during sexual contact. In addition to the "traditional" STDs (syphilis and gonorrhea), the spectrum of STDs now includes HIV infection, which causes AIDS; Chlamydia trachomatis infections; human papilloma virus (HPV) infection; genital herpes; chancroid; genital mycoplasmas; hepatitis B; trichomoniasis; enteric infections; and ectoparasitic diseases (i.e., diseases caused by organisms that live on the outside of the host's body). The complexity and scope of STDs have increased dramatically since the 1980s; more than 20 micro-organisms and syndromes are now recognized as belonging in this category.

THREE-DRUG THERAPY: A combination of the drugs efavirenz, lamivudine, and zidovudine (AZT).

TRANSMISSION: In the context of HIV disease: HIV is spread most commonly by sexual contact with an infected partner. The virus can enter the body through the mucosal lining of the vagina, vulva, penis, rectum, or, rarely, the mouth during sex. The likelihood of transmission is increased by factors that may damage these linings, especially other sexually transmitted diseases that cause ulcers or inflammation. HIV also is spread through contact with infected blood, most often by the sharing of drug needles or syringes contaminated with minute quantities of blood containing the virus. Children can contract HIV from their infected mothers during either pregnancy or birth, or postnatally, through breast-feeding. In developed countries, HIV is now rarely transmitted by transfusion of blood or blood products because of screening measures.

TUBERCULOSIS (TB): A bacterial infection caused by *Mycobacterium tuberculosis*. TB bacteria are spread by airborne droplets expelled from the lungs when a person with active TB coughs, sneezes, or speaks. Exposure to these droplets can lead to infection in the air sacs of the lungs. The immune defenses of healthy people usually prevent TB infection from spreading beyond a very small area of the lungs. If the body's immune system is impaired because of HIV infection, aging, malnutrition, or other factors, the TB bacterium may begin to spread more widely in the lungs or to other tissues. TB is seen with increasing frequency among HIV-positive persons.

Most cases of TB occur in the lungs (pulmonary TB). However, the disease may also occur in the larynx, lymph nodes, brain, kidneys, or bones (extrapulmonary TB). Extrapulmonary TB infections are more common among persons living with HIV.

VIRAL BURDEN: The amount of HIV in the circulating blood. Monitoring a person's viral burden is important because of the apparent correlation between the amount of virus in the blood and the severity of the disease: sicker patients generally have more virus than those with less advanced disease. A new, sensitive, rapid test—called the viral load assay for HIV-1 infection—can be used to monitor the HIV viral burden. This procedure may help clinicians to decide when to give anti-HIV therapy or to switch drugs. It may also help investigators determine more quickly if experimental HIV therapies are effective.

VIRAL LOAD TEST: In relation to HIV: Test that measures the quantity of HIV RNA in the blood. Results are expressed as the number of copies per milliliter of blood plasma. Research indicates that viral load is a better predictor of the risk of HIV disease progression than the CD4 count. The lower the viral load, the longer the time to AIDS diagnosis and the longer the survival time. Viral load testing for HIV infection is being used to determine when to initiate and/or change therapy.

VIRAL REPLICATION: There are generally 6 steps that take place in viral replication. Adsorption (attachment to the host cell), penetration, uncoating, genome replication (viral synthesis), maturation, and release.

WASTING SYNDROME: See AIDS Wasting Syndrome.

YEAST INFECTION: See Candidiasis.

Source: FANTA 2004.

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