South African National Guidelines on Nutrition for People Living with HIV, AIDS, TB and other Chronic Debilitating Conditions
National Guidelines on Nutrition for people living with HIV, AIDS, TB and other Chronic Debilitating Conditions

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Foreword

Good nutrition is an essential foundation for health. In the context of HIV and AIDS, the scientific evidence has been accumulating over the years that in the absence of sound and balanced nutrition HIV disease progression may be accelerated. Almost from the onset, HIV infection causes changes in nutritional status and dietary intake requirements. It has further become apparent that children and adults at all stages of the HIV disease spectrum are at increased risk of nutritional deficiency and the consequent malnutrition. The cause of malnutrition is multi-factorial and related to loss of appetite, mal-absorption, increased losses (due to vomiting, diarrhoea, renal losses, etc.) and alterations in metabolism. As HIV infection is likely to co-exist in any one individual with other infections such as TB, it is necessary to consider too the impact of these diseases on nutritional status.

In 2001, the first National Guidelines on Nutrition for People Living with TB, HIV and AIDS and other Chronic Debilitating Conditions, were developed and published. Since then, Government has developed an integrated, holistic approach to management of HIV disease including the implementation of the Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa. Also, new scientific research on HIV, AIDS and nutrition has been published. These emerging developments mandated that the guidelines and other related documents on nutrition and HIV and AIDS be updated.

These guidelines are meant for use by all health care personnel that are primarily responsible for the care and support of individuals infected and affected by TB, HIV and AIDS. These guidelines will provide knowledge and information on nutritional care and support for individuals living with TB, HIV, AIDS and other chronic debilitating conditions. We would like to express our gratitude to all the departments, organizations and individuals whom we consulted during the updating of these guidelines.

Dr M E Tshabalala-Msimang
Minister of Health
Acknowledgements

The updating of the South African national guidelines on nutrition for people living with TB, HIV, AIDS and other chronic debilitating conditions shows government commitment to promoting good nutrition for the infected and affected individuals. Nutrition has been identified as one of the important elements of the Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa.

The Department of Health would like to express its sincere gratitude to the following Departments for their contribution in updating these guidelines: Health, Agriculture, Social Development, Education, Correctional Services and Defence. Special thanks go to lead consultant, Dr T Hlatshwayo-Moleah for her technical input, commitment and dedication, which contributed a great deal to the development of the guidelines. Recognition goes to the editorial team of the Department of Health, Directorate: Nutrition for their tireless work in reviewing, compiling and finalizing the document.

We would like to express our appreciation to all those persons who in one way or another contributed to make the updating of the guidelines a reality. In particular we appreciate the various representatives from the Tertiary institutions, Research Agencies, Provincial Nutrition units and other stakeholders for their time, technical contributions and comments.

Mr T Mseleku
Director General: Health
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References
AIDS
A group of illnesses caused by the human immunodeficiency virus that weakens the immune system.

Antioxidant
An antioxidant is a substance that slows or halts oxidation, which is a type of chemical reaction that involves the release of electrons (not only in response to oxygen or air).

Anti-retroviral
Drugs used for HIV prophylaxis or treatment; however they are not a cure for HIV disease.

CD4 cell count
This is a quantitative measure of CD4+ lymphocytes, used to assess immune status and prognosis for progression to AIDS and to make treatment decisions regarding antiretroviral therapy and opportunistic infections prophylaxis.

Food Safety
The assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use.

Health care personnel
It means any person who is involved in the provision of health to a user, including those that are providing health services in terms of any law.

Indigenous food
Available foods of plant or animals that are of origin in that country/region or community.

Immuno-compromised
Weakened body defence system leading to easy attack by viruses and bacteria.

Lean Body Mass
Equates to the amount of muscles in the body.

Legumes
Plant sources of protein e.g. Beans, peas, jujube beans, groundnuts, cowpeas.

Malabsorption
Failure of the digestive tract to absorb nutrients into the body.

Malnutrition
A condition caused by inadequate or excess intake of nutrients. In these guidelines it refers to under-nutrition (inadequate intake).
Mixed feeding
Feeding both breast milk and other foods or liquids.

Nutrient
A substance or component of food. Food contains Carbohydrates, different nutrients that include water, proteins (amino acids), fats (lipids), vitamins and minerals.

Nutritional status
The processes involved in the taking in and utilization of food substances by which growth, repair and maintenance of the body or in any of its parts are accomplished.

Opportunistic
Denotes an infection by microorganism that does not ordinarily cause disease but becomes infectious under certain conditions, such as when the immune system is impaired.

Replacement feeding
Feeding infants who are not getting breast milk with a diet that provides the nutrients infants need until the age they can be fully fed on family foods.
<table>
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<th>Abbreviations</th>
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<td>3TC</td>
<td>Lamivudine</td>
</tr>
<tr>
<td>ABC</td>
<td>Abacavir</td>
</tr>
<tr>
<td>AFASS</td>
<td>Acceptable, Feasible, Affordable, Sustainable, and Safe</td>
</tr>
<tr>
<td>AIDS</td>
<td>Acquired Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>ARI</td>
<td>Acute Respiratory Infection</td>
</tr>
<tr>
<td>ART</td>
<td>Antiretroviral Therapy</td>
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<tr>
<td>ARV</td>
<td>Antiretroviral Drug</td>
</tr>
<tr>
<td>AZT</td>
<td>Azidothymidine or Zidovudine</td>
</tr>
<tr>
<td>BIA</td>
<td>Bioelectrical Impedance Analysis</td>
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<tr>
<td>BMI</td>
<td>Body Mass Index</td>
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<tr>
<td>D4T</td>
<td>Stavudine</td>
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<tr>
<td>DDI</td>
<td>Didanosine</td>
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<tr>
<td>EBF</td>
<td>Exclusive Breastfeeding</td>
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<tr>
<td>EFZ</td>
<td>Efavirenz</td>
</tr>
<tr>
<td>ERF</td>
<td>Exclusive Replacement Feeding</td>
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<tr>
<td>FBDG</td>
<td>Food Based Dietary Guidelines</td>
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<tr>
<td>Hb</td>
<td>Haemoglobin</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>HAART</td>
<td>Highly Active Antiretroviral Therapy</td>
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<tr>
<td>IDV</td>
<td>Indinavir</td>
</tr>
<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illnesses</td>
</tr>
<tr>
<td>Kg</td>
<td>Kilogram</td>
</tr>
<tr>
<td>Kcal</td>
<td>Kilocalories</td>
</tr>
<tr>
<td>LPV</td>
<td>Lopinavir</td>
</tr>
<tr>
<td>MUAC</td>
<td>Mid-Upper Arm Circumference</td>
</tr>
<tr>
<td>NNRTI</td>
<td>Non-nucleoside Reverse Transcriptase Inhibitor</td>
</tr>
<tr>
<td>NNRTI</td>
<td>Nucleoside Reverse Transcriptase Inhibitor</td>
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<tr>
<td>NFV</td>
<td>Relfinavir</td>
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<tr>
<td>NVP</td>
<td>Nevirapine</td>
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<tr>
<td>OVC</td>
<td>Orphans and Vulnerable Children</td>
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<tr>
<td>PLWHA</td>
<td>People Living with HIV and AIDS</td>
</tr>
<tr>
<td>QNS</td>
<td>Quick Nutrition Screening</td>
</tr>
<tr>
<td>RDA</td>
<td>Recommended Dietary Allowance</td>
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<tr>
<td>RTV</td>
<td>Ritonavir</td>
</tr>
<tr>
<td>SQV</td>
<td>Saquinavir</td>
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<tr>
<td>TB</td>
<td>Tuberculosis</td>
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<tr>
<td>TSF</td>
<td>Triceps Skinfold Thickness</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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<tr>
<td>ZDV</td>
<td>Zidovudine or Azidothymidine (AZT)</td>
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</tbody>
</table>
Introduction

These guidelines are meant for use by all health care personnel that are primarily responsible for the care and support of individuals infected and affected by TB, HIV and AIDS. These guidelines will provide knowledge and information for human immunodeficiency virus (HIV), acquired immune deficiency syndrome (AIDS), Tuberculosis (TB), and other chronic debilitating conditions. Malnutrition is a common denominator complicating HIV, AIDS, TB and other chronic debilitating conditions and does play a significant and independent role in morbidity and mortality. Thus nutritional status is a key input in delaying HIV progression and a predictor of survival as recognized by many researchers.

Whilst adequate nutrition cannot cure HIV and AIDS, nor TB and chronic debilitating conditions, it is essential to maintain the immune system and physical activity so as to achieve optimal quality of life.

Our knowledge on the linkages between nutrition and HIV and AIDS is evolving, therefore this document will address the current knowledge with the aim of revising at regular intervals as new research information becomes available. A lot more is known about nutrition and infections; and nutrition and Chronic Debilitating Conditions. This document will summarize the essential important nutrition recommendations relevant to South Africa. The onset of AIDS and death might be delayed where HIV infected people are well nourished. These guidelines are therefore an interpretation of the best available evidence to date from various sources.

Background

The Department of Health has always recognized and promoted good nutrition for people living with TB, HIV and AIDS and other chronic debilitating conditions. This is manifested by the development of the first National Nutrition Guidelines on Nutrition for People Living with TB, HIV and AIDS and other Chronic Debilitating Conditions in 2001. The operational plan for Comprehensive HIV and AIDS Care, Management and Treatment of South Africa approved by cabinet in 2003 recognizes the importance of nutrition as part of the comprehensive package of care for people living with HIV and AIDS. Nutrition interventions for people living with TB, HIV and AIDS should be integrated with the broader nutrition intervention strategies of the government as articulated in the operational plan.

Since then, new developments and scientific information on nutrition and HIV and AIDS has emerged. The emerging developments demanded that the current guidelines be reviewed and updated. The guidelines will aim at adding new areas such as nutritional considerations in modern and traditional therapies; nutritional component of the home/community-based care; and food security for households infected and affected by HIV and AIDS.

In South Africa both TB and HIV infections occur among adult and paediatric populations that already suffer from inadequate nutrition. In these undernourished groups, both TB and HIV infections progress rapidly exacerbating immune deficiency and increasing susceptibility to further infections. Optimising nutrition may help to delay the progression of HIV infection. For the majority of South African living with the onset of HIV infection, achieving and maintaining a
healthy nutritional status is instrumental in slowing the progression of the HIV infection, and delaying the time until treatment with ARVs becomes necessary. These guidelines will be implemented within the broader framework of the Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa and other related guidelines. The guidelines will also be implemented within the broader nutrition intervention strategies.

**Rationale for the Guidelines**

These guidelines define actions for health care personnel primarily responsible for care and support of TB, HIV and AIDS and other debilitating conditions. These actions need to be undertaken in order to provide quality care and support for PLWHA at all levels and various contact points including home-based care and community care groups.

**Purpose of the Guidelines**

To provide health care personnel with guidance to make accurate, consistent and appropriate information on nutritional care and support for people living with HIV and AIDS, TB and other Chronic Debilitating Conditions, and also to:

- Provide stakeholders with information that will enable them to adapt these guidelines to suit their environments and to ensure the best care and support for PLWHA and TB.
- Promote the use of locally available foods.
- Design, plan, and monitor nutrition intervention programmes in conjunction with other relevant documents.
- Advocate good nutrition for individuals living with TB, HIV, AIDS, and chronic debilitating conditions.
- Empower PLWHA to better care for themselves i.e. make the best informed decisions on food choices especially when resources are limited and to understand the claims and evidence for over the counter food and nutrition products marketed for persons with HIV.
- Develop Information, Education and Communication (IEC) materials for use by PLWHA, TB and other chronic debilitating conditions and their caregivers.
1. **Basic facts on Nutrition and TB, HIV and AIDS**

1.1 What is Nutrition?

Nutrition refers to how food is utilized by the body for growth, reproduction and maintenance of health. Foods contain different nutrients that include water, proteins/ amino acids, carbohydrates, lipids/fats, vitamins and minerals.

1.2 Why is good nutrition important?

**Good nutrition is essential for:**

- Production of energy, keeping the body temperature and movement.
- Work, breathing, and the brain functioning.
- Growth, development, replacement and repair of cells and tissues.
- Carrying out metabolic processes such as digestion, absorption, and transportation of nutrients.
- Protection against diseases and recovery from diseases.

Some nutrients are needed in large amounts, and these are called **macronutrients**. They include proteins, carbohydrates and fats. The **micronutrients** include vitamins and minerals that are required in small amounts. Some macro- and micronutrients are essential as the body cannot synthesize them in required amounts and must therefore, be consumed from foods. They are needed in right amounts and combinations for the proper functioning of the body.

1.3 What are the components of nutritional care and support?

- Nutrition assessment and screening.
- Nutrition education and counselling.
- Food safety, hygiene and food preparation.
- Physical activity.
- Reproductive health practices.
- Psychosocial support.
- Symptom based management.

It is important to position nutritional care and support as an integral part of any comprehensive care and treatment of people infected with HIV, if one is to mitigate the progression of HIV to AIDS.

1.4 Link between nutrition and infections

The relationship between HIV and AIDS and poor nutrition is cyclical. This means that in the development of the disease, one problem worsens the other and so on. Unless the cycle is broken, poor nutrition will result. Poor nutrition due to poor food intake, increased nutrient usage in the
body, weakens the immune system, which in turn decreases the ability of the body to fight other infections. The weakened immune system results in repeated infections, which in turn lead to poor nutrition and so the cycle continues.

Although the causes of poor nutrition are complex, they include amongst others:

- Reduction in food intake due to Poverty and non-availability of good quality and quantity of food.
- Oral/gingival ulcers, oesophagitis.
- Fatigue, depression, nutrition-related and infection-related changes in mental state.
- Abdominal pain.
- Loss of appetite (primary anorexia) caused by cytokines released during immune response - this is probably the main reason for wasting in HIV-infected adults and children.
- Side effects from drugs used to treat HIV-related infections.
- Nutrient malabsorption may be due to pancreatic insufficiency resulting in malabsorption of fats, carbohydrates related to immune response.
- HIV infection of the intestinal cells.
- Vomiting and frequent diarrhoea.
- Opportunistic infections.
- Nutrient losses in urine and stools.
- Increased needs for energy and protein caused by virus.
- Altered (growth hormone) receptor sensitivity.

1.5 Vicious cycle of Malnutrition and Infection

As illustrated in Figure 1, malnutrition increases vulnerability to and severity of infections, and infections aggravate malnutrition. Inadequate dietary intake leads to malnutrition and lowered immune system function. Malnutrition reduces the body's ability to fight infections and therefore contributes to increased incidence, severity and length of infections. Symptoms that accompany infections, such as loss of appetite, diarrhoea, and fever, lead to reduced food intake, malabsorption, nutrient losses, and altered metabolism, which lead to weight loss, growth faltering, and further weakening of the immune system.

1.6 Weight loss in HIV and AIDS

HIV infection and diarrhoea over a long period of time result in weight loss or wasting. This weight loss is a major problem and causes poor health and earlier death. In Africa the wasting seen in HIV infection is not always the result of HIV and AIDS alone. Often TB infection is present as well. Weight loss is very rapid in people with combined HIV and TB infections.

Most people with HIV do not lose weight constantly. Weight loss usually occurs in episodes when the HIV positive person has an infection, for example pneumonia, tuberculosis and diarrhoea. These periods of weight loss can easily lead to the loss of 10 to 15kg. After recovering from the infection, the HIV positive person can regain some weight, although often not back to the original
weight. Repeated episodes of infections will therefore cause gradual weight loss over time. It is important to eat well at all times, especially when recovering from infections.

Figure 1. The cycle of Malnutrition and Infection

1.7 Tuberculosis and nutrition

The link between tuberculosis and malnutrition has long been recognized. Malnutrition may predispose people to the development of clinical disease, and tuberculosis can contribute to malnutrition. Nutritional status appears to be an important determinant of clinical outcome during tuberculosis. Patients with TB suffer from deficiencies of vitamin A, thiamine, vitamin B6, folate and vitamin E. Anaemia is highly prevalent among adults with pulmonary TB. Although anaemia that appears as a result of chronic disease accounts for a large part of the anaemia found in TB, iron deficiency might also be a contributing factor.
1.7.1 TB and HIV Infection

The risk of developing clinical tuberculosis is greater among individuals with immunosuppression, which explains the increase in the prevalence of TB in association with HIV infection. Co-infection with HIV and tuberculosis introduces an extra dimension to the pathophysiology of wasting exacerbating the wasting seen in tuberculosis of HIV infection alone.

Nutritional alterations in TB, HIV infection, or TB and HIV combined include increased energy expenditure, nutrient malabsorption, micronutrient malnutrition, and increased production of inflammatory cytokines with lipolytic and proteolytic activity. Tuberculosis is a common co-morbid illness with HIV.

HIV co-infection is associated with higher mortality rate due to TB when effective treatment is delayed. The “triple trouble” of HIV and tuberculosis infection and malnutrition may put those infected at greater risk than those with any of the three conditions alone.

**Active TB can be prevented and cured, even in people with HIV infection**

1.7.2 Children and TB

- Any child under the age of 5 years old can get TB more easily than other people. They may also get more severe forms of TB because their immune systems are not fully developed.

- The signs of TB in children are different from those in adults. A health care personnel should suspect TB if the child has:
  - Contact with an adult who has pulmonary TB.
  - Fever for more than 1 week.
  - A chronic cough (for more than 3 weeks).
  - Ongoing weight loss or poor weight gain (Refer to Road to Health Chart).

- Providing the child infected with TB with adequate energy and nutrients is very important. This is because the child has increased requirements as a result of the TB infection and their growth.

- Meeting the increased nutrient requirements for children may be a challenge because they have a smaller stomach capacity and poor appetites than adults. It is particularly important therefore to use household ingredients such as peanut butter, non-fat dry milk powder etc. in foods to increase the protein and energy content without adding to the bulk of the meal.

**The best way to monitor weight gain and detect malnutrition in children, is to use the Road to Health Chart**
2 Nutritional Requirements for TB, HIV and AIDS

2.1 Nutritional Requirements for PLWHA

Good nutrition for all South Africans, especially PLWHA, requires consumption of adequate amount in the appropriate proportions of macronutrients (proteins, fats, carbohydrates) and micronutrients (vitamins and minerals). Remember that many people from poverty stricken areas might be experiencing pre-existing malnutrition and that HIV worsen the situation. Therefore adequate nutrition support maximizes management of HIV and other chronic debilitating conditions and can prevent or delay loss of muscle mass. The stage of disease influences nutritional needs of PLWHA. Aids-related symptoms such as fever, diarrhoea, wasting and weight loss might increase the required nutrient intake.

2.1.1 Macronutrients

Energy requirements

Energy required during any infection increases. In PLWHA the increase is according to HIV stages. Energy requirements in PLWHA are recommended as follows:

- Energy requirements increase by 10% to maintain body weight and physical activity in asymptomatic HIV-infected adults, and growth in asymptomatic children.
- In symptomatic HIV-infected, energy requirements increase by 20% to 30% to maintain adult body weight.
- Energy intakes need to be increased by 50% to 100% over normal requirements in children experiencing weight loss.

Protein requirements

- There is insufficient evidence for an increased need for protein intake of people infected by HIV and AIDS over and above that required by healthy non-HIV infected persons.
- The recommended protein intake is 12 to 15% of total energy intake.

An example of energy and protein requirements of a 25-year-old HIV-infected asymptomatic man:

Energy Requirement + HIV status* = TOTAL
2 140Kcal + 214Kcal = 2 354Kcal

* The addition for the man's HIV infection was estimated to be 10% of 2 140kcal, or 214kcal.

His daily protein requirements would be 56g per day (i.e. 49g base).
An example of energy and protein requirements translated into food items:

<table>
<thead>
<tr>
<th>Food items</th>
<th>Servings*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starchy foods</td>
<td>10-12 servings</td>
</tr>
<tr>
<td>Vegetables and Fruits</td>
<td>5 servings</td>
</tr>
<tr>
<td>Meat, fish and poultry</td>
<td>3 servings</td>
</tr>
</tbody>
</table>

* Examples of servings and a sample menu of the nutritional requirements for the man are illustrated in Annexures 5 and 6

**Fat requirements**

- There are no special requirements for HIV infection.
- Certain symptoms such as diarrhoea, steatorrhea in adults may require changes in fat intake.
- Special advice regarding fat intake might be required for individuals undergoing antiretroviral therapy due to hyperlipidaemia and other related conditions.
- 30-35% of total energy needs (approximately 80g) should come from fat.

**2.1.2 Micronutrients**

- Micronutrients are natural substances found in small amounts in food (e.g. vitamins and minerals). The body only requires small amounts of micronutrients, and they are important for maintaining good health.
- Many South Africans do not eat a wide variety of foods to provide all micronutrients they need.
- Vitamins and minerals, such as vitamins A, B-complex, C and E, as well as selenium, zinc are needed for the immune system to fight infections and deficiencies of these vitamins are commonly found in HIV infected adults and children. Annexure 1 gives the roles of various vitamins and minerals and deficiencies related to them.
- Micronutrient intakes at one RDA level are recommended for HIV-infected individuals. The table on RDA levels for non-infected individuals is attached as Annexure 2.

**2.2 Nutritional Response to TB Infection**

**2.2.1 Energy**

- The body uses more energy in its attempt to fight the infection. Hence patients with active TB characteristically have a loss of body weight and appetite, thereby increasing their energy needs.
- Energy needs of TB patient are increased by approximately 35-40kcal per Kg of ideal body weight.
2.2.2 Protein

- The body responds to the TB infection by various degree of tissues breakdown.
- There is an increase in protein breakdown that leads to muscle wasting. The breakdown of protein and other reserves due to fever may also worsen under-nutrition and further impair resistance against the infection.
- The protein intake of the diet is important to prevent the wasting of body stores. Approximately 75g-100g per day (3 to 4 servings) should be sufficient intake.

2.2.3 Micronutrients

- The increased energy expenditure and tissue breakdown associated with infection are thought to increase the requirements of micronutrients like vitamin A, E, B12, C, D, and folate.
- It is also known that a decrease in blood levels of trace elements such as iron, zinc and selenium occur during the infection.
- It is advised that a person with TB, take a multivitamin and mineral supplement providing 100% of the recommended daily allowance. This is because it is unlikely that TB patients will be able to meet the increased requirements for vitamins and minerals with diet alone due to poor appetite.
3 Nutritional Action, Care and Support of People Living with TB, HIV and AIDS

3.1 Nutrition Screening and Assessment

The first step in nutritional care is to assess the nutritional status of the person.

Nutrition assessment includes the evaluation of nutritional status using anthropometric measures, biochemical, clinical and dietary needs. An individualized nutrition care plan is developed and based on anthropometric measurements, dietary intake and medical treatment.

Nutritional screening identifies individuals in need of nutrition intervention based upon specific criteria. An initial assessment of the HIV-positive person provides important baseline information on nutritional status as well as overall well-being. This allows health care personnel to begin to implement dietary interventions or strategies that may help to reduce or alleviate the nutritional complications associated with HIV-disease and thus, preventing or even altering the effects of wasting.

3.2 Anthropometric Measurements

3.2.1 Height

The actual height of the client should always be measured at the first visit. Devices such as stadiometers (height measure) and length boards for children are the most accurate way to measure height. Balance beam scales usually have a height-measuring device. Another option is to use a measuring tape placed on the wall. Height in adults may be taken once a year. In children, height/length should be taken every three months. Regular measuring of growth in children is a sensitive way of monitoring disease progression. This should be done by staff specifically trained in length/height measurement and with equipment that is regularly calibrated to ensure accuracy.

3.2.2 Weight

A series of weight measurements over a period of time is needed for both children and adults. Weight loss of >10% is linked to a 2.5 fold in death rate. A weighing scale that can be calibrated and zeroed is recommended. Regular weight measurements are particularly important in the presence of chronic illness. Weight measurements should be done routinely at each and every visit and be recorded. In order to ensure accuracy, the same scale should be used and calibrated regularly.

3.2.3 Body Mass Index (BMI)

The degree of thinness is assessed using the body mass index (BMI) as the indicator. BMI is defined as the body weight (in kg) divided by the square of the height (in metres). Body mass index of less
than 18 in HIV positive persons is a significant independent predictor of mortality. BMI assesses a person’s weight status as simply being underweight, average weight or overweight based on height. BMI may only be used for persons above the age of 18. The table below shows the BMI cut-off points and how they are interpreted.

Table 1: Classification of malnutrition in adults by BMI

<table>
<thead>
<tr>
<th>BMI Cut-off points</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>19-24</td>
<td>Normal</td>
</tr>
<tr>
<td>25-29</td>
<td>Overweight</td>
</tr>
<tr>
<td>30-39</td>
<td>Obesity</td>
</tr>
<tr>
<td>&gt;40</td>
<td>Severe overweight</td>
</tr>
</tbody>
</table>

A formula to calculate BMI:

\[
\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (in metres)}^2}
\]

Example:
A male of 19 years, weighing 99 kg, and is 190 cm (1.90 meters) tall.

\[
\text{BMI} = \frac{\text{Weight in kg}}{\text{Height in m}^2} = \frac{99 \text{ kg}}{1.9 \times 1.9 \text{ m}} = 27.5 \text{ (BMI)}
\]

The client is classified as overweight.

3.3 Body Composition

It has been widely agreed that the ability to maintain lean body mass, or muscle tissue can and will influence the survival of an individual infected with HIV. There is a strong correlation between severe loss of muscle mass and death. Lipodystrophy syndrome (fat loss and/or fat accumulation in distinct regions of the body) is being observed in patients achieving viral suppression on the highly active antiretroviral therapies (HAART). Some of the characteristics of these fat changes include “lipodystrophy,” a loss of fat in the arms, legs, buttocks, and face, that may or may not be accompanied by accumulation of visceral fat to the abdomen, or fat to the breasts in women, or back or front of the neck.

The redistribution of fat to the mid-section of the body may be associated with increased risk of other diseases such as heart and gallbladder disease and diabetes. For these reasons, it is important to regularly monitor total weight, body composition, and body weight distribution as a part of routine health care for persons living with HIV.
3.3.1 Waist-to-Hip Ratio

Waist-to-hip ratio is used to document changes and trends in body fat distribution. The ratio should be measured at least once in 6 months, especially in people who are on antiretroviral therapy. A waist-hip ratio equals to or < 0.8 for women and 1 for men is recommended. Measurements greater than this may predict cardiac risk factors in normally nourished HIV patients with lipodystrophy.

3.3.2 Mid-Upper Arm Circumference (MUAC)

MUAC on its own gives evidence of loss of muscle mass/wasting. Cut-off points for different age groups should be used. This is important in growing children and is especially valuable in evaluating the person who may be malnourished as a result of chronic illness. MUAC does not respond rapidly when malnourished children are treated, and so it is less helpful as a way of measuring recovery or improvement of nutritional status over a short period of time.

3.3.3 Triceps Skinfold (TSF)

Triceps Skinfold thickness measures the amount of subcutaneous body fat. Skinfolds can also provide useful information via Durnin-Womersley equation on subcutaneous lipodystrophy in patients with HIV lipodystrophy. Skinfolds have been validated in HIV patients. A skinfold calliper is required to measure TSF, and requires a trained person. Changes in TSF are estimated to take 3 to 4 weeks.

3.3.4 Bioelectrical Impedance Analysis (BIA)

BIA provides estimates on total body fat, fat-free mass and total body water, but does not give information on regional adiposity. It is generally accepted that more than one BIA test is necessary to establish a baseline, identify a trend in body composition, and provide the basis for starting or changing therapy. Lean body mass determined from BIA has been shown to predict survival in HIV patients, even after adjusting for CD4. BIA is not sensitive enough alone to identify body shape changes seen in "lipodystrophy syndrome". This is mainly used as a research tool.

3.4 Biochemical Measures

Biochemical lab measures are necessary to identify and provide intervention strategies for clinical deficiencies and abnormalities. Haemoglobin, hematocrit (for iron status); serum albumin or pre-albumin (for protein status); Serum B12, zinc and folate (for micronutrient depletion); fasting blood sugar and lipid status and blood glucose levels, should be assessed regularly (once every 6-12 months) once started on ART. The biochemical nutritional indicators should be taken at the same interval as other biochemical measurements.
3.5 Food and Nutrition History

To assess the food and nutrition history of individuals, a 24-hour dietary recall in combination with a food frequency questionnaire should be used. A Quick Nutrition Screening (QNS) tool may also be used to assess the current status of nutrition adequacy. The QNS tool is attached as Annexure 3. Review the body systems such as oral disturbances (e.g. thrush and ulcers), gastro-intestinal disturbances (e.g. nausea, vomiting, diarrhoea) and fever and sweats. All of these may contribute to poor dietary intake.

3.6 Physical and Clinical Examination

The clinical examination should include a complete physical examination and medical history. Special attention should be given to the areas where signs of nutritional deficiencies appear - skin, hair, teeth, gums, lips, tongue and eyes. Symptoms of nutrient deficiencies may or may not be apparent on the physical examination.

Nutritional assessment summary and recommendations

Food and nutrition history:
Do a 24-hour recall and, also include questions on food access and availability

Anthropometric measurement:
Height in adults, length in children, weight, BMI, Waist-to-Hip ratio, consider MUAC in children

Biochemical assessment:
Half-yearly fasting lipids, glucose and with change in ARV, yearly haemoglobin

Physical and Clinical Examination:
Obtain medical history and do physical examination at each visit

3.7 Promoting Healthy Lifestyles

Good nutrition is important for everyone in promoting a healthy lifestyle. It is best to start taking better care of oneself as soon as one becomes aware that one is infected with HIV.

3.7.1 Making wise food choices

There is more than one way to eat healthy. Foods that are culturally acceptable, wholesome, easily available and affordable are encouraged. Using the South African Food Based Dietary Guidelines (FBDG) as listed below will assist individuals to make wise food choices.
Enjoy a variety of foods

Healthy eating means eating a variety of foods to supply all bodies' needs. No single food or meal provides all nutrients the body needs. A variety of foods mean consuming more than one type of food at each meal, eating different foods on different days and preparing it in different ways.

Make starchy foods part of each meal

Unrefined starchy foods provide the energy we need. These foods are relatively cheap and supply most energy, which will help to keep the body weight stable.
They are very important for the protein-sparring effect and add to vitamins B group and E if unrefined.

Examples:
Bread, pap, phuthu, ting, soft porridge, cereals, rice, potatoes, sweet potatoes, samp, millet, mealies, sorghum, pasta, etc.

Eat at least vegetables and/or fruits daily

Vegetables and fruits supply the vitamins and other substances that keep the immune system strong. These foods are especially important for people living with TB, HIV and AIDS to help in the fight against infections. A wide variety of different fruits and vegetables should be eaten every day. Include fruits and vegetables of a yellow, orange, red or dark green colour. Besides Vitamin A and C, vegetables and fruits supply many other vitamins and other substances, which support the immune system and form part of a healthy eating pattern.

Examples:

**Vegetables:** Spinach, morogo, pumpkin leaves, green peppers, sweet potato, pumpkin, beetroot and beetroot leaves, carrots, watermelon leaves, etc.
**Fruits:** yellow peaches, apricots, paw-paws, mangoes, oranges, naartjies, grapefruit, lemons, guavas, mangoes, tomatoes, marula fruit, etc.

Meat and dairy foods may be eaten daily

For people living with TB, HIV and AIDS it is very important to maintain healthy and strong muscles. Foods from animal sources provide the body with proteins to build strong muscles and they also help to keep the immune system healthy.

Examples:

Beef, mutton, goat, pork, chicken, fish, Organ meats such as liver, kidney, heart, trotters, chicken feet, tripe (mala mogodu), eggs, milk, yoghurt, buttermilk, sour milk, milk powder, cheese, mopani worms, insects, termites, etc.
Include dried beans, peas, lentils, peanuts or soya regularly

This group of foods from plant sources also supply proteins needed to strengthen the immune system and the muscles. For vegetarians who are infected with TB or HIV, these foods should form an even more important part a healthy eating pattern. For people who are not vegetarian these foods provide economical protein source, and provide soluble fibres that lowers total cholesterol, prevent constipation and lower blood sugar. These are risks for heart diseases, certain cancers and diabetes.

Examples:
Dried beans, peas, lentils, peanuts, peanut butter, jugo beans, soybeans, groundnuts, etc.

Include Sugars, Fats and Oils

Sugars, fats and oils are also part of a healthy, balanced eating pattern. They provide a source of energy for the person living with TB, HIV and AIDS. They are necessary for building cells and absorption and transportation of fat-soluble vitamins A, D, E and K. Note that in the late stage of HIV infection, eating a lot of fat can cause diarrhoea. Sugars like table sugar, regular cold drinks, fatty desserts, even some sweetened fruit juices that quickly get digested to simple sugar should be taken in small quantities, as they will raise the blood sugar levels too fast.

Examples:
Yetkoek, cakes, pastries, biscuits, cookies, tarts, puddings, desserts, butter, margarine, cooking oils, cream, mayonnaise, salad dressings, etc.

Use Salt Sparingly

The body looses salt during diarrhoea and vomiting. Therefore, the salt needs to be replaced. Eating a lot of salt contributes to high blood pressure and it is advisable to use salt sparingly because many people in South Africa suffer from high blood pressure. Using salt sparingly helps to control the blood pressure and may help to reduce the need of medicines.

Drink lots of clean, safe water

Diarrhoea and vomiting both cause loss of water from the body. Night sweats also cause losses of large amounts of water. Losses have to be replaced by drinking enough fluids everyday and more is needed if there is diarrhoea or vomiting. About 8 cups (2 litres) of liquid per day should be enough. People with TB, HIV and AIDS do not have to drink only water; all liquids (excluding alcohol) add water to the body. Cold drinks, milk, fruit juice and any other beverages should be taken throughout the day. Drink water from the tap if water from the area is safe, but if the water comes from a well, river or borehole it is safer to boil and cool it before use.
3.7.2 Smoking

Avoid smoking because it increases vitamin C requirements and is a known risk factor to chronic debilitating conditions such as certain cancers and heart diseases.

3.7.3 Exercise

- Moderate exercise is beneficial to the immune system, and can also improve mood and offer an important way of maintaining a healthy self-image. Regular exercise may reduce the total body and trunk fat among HIV positive persons with body fat changes.
- Exercise helps to prevent loss of muscle, helps strengthen the body and stimulates appetite. If loss of muscle persists even after exercises, the client should be referred to health care personnel.
- If taking ARVs, it is important to assess whether the changes in body shape (composition) are a side effect of the drugs. Clients should be referred to a health care personnel for advice.

Examples of exercises:
- Walking, aerobics, jogging, stair climbing, hiking, skipping, etc.
- Light physical activities at home such as doing laundry, cleaning, gardening, etc.
- Weight lifting exercises.

3.7.4 Alcohol

Drinking alcohol may affect immune system and may slow down recovery from infections. Alcohol use can have potentially serious consequences for people taking ARV drugs. Alcohol is processed by the liver and a healthy liver is important for the body to process medicines effectively. The blood fat increases caused by some ARVs can be made worse by heavy drinking.

Examples:
Alcoholic drinks include wine, beer (including home-brewed beer and sorghum beer), ciders, alcoholic coolers, whiskey, rum, gin, vodka, cane and other hard drinks.

3.7.5 Psychosocial support

Psychosocial support is an important part of nutritional care and support because depression, stress and stigma have a great impact on self-esteem, which can affect appetite and ultimately nutrition intake. PLWHA and TB should be provided with emotional, spiritual and social support.

3.8 The Use of Nutritional Supplements

In addition to healthy eating, nutritional supplements may be needed due to increased requirements. Nutritional supplements are available in many forms including tablets, capsules, powders, geltabs, extracts, syrups and other liquids. Although the most prevalent type of
nutritional supplement is a multivitamin/mineral tablet or capsule, a wide array of substances is currently available including herbal supplements as well as ingredients and extracts of animal and plant origin.

3.8.1 Micronutrient Supplements

Things to consider when taking micronutrient supplements such as Vitamins and minerals:
- Always take vitamin pills on a full stomach. Be consistent and take them regularly.
- It is probably better (and cheaper) to take one multivitamin tablet with minerals daily rather than several pills containing different vitamins and minerals.
- Not all multivitamin tablets available at pharmacies are the same.
- High doses of vitamins can cause nausea, vomiting, decreased appetite and liver and kidney problems. It is also known that very high intakes of zinc and vitamin A can decrease immunity in people with HIV and AIDS. Discuss vitamin pills with health care personnel.

Remember that vitamin pills cannot make up for not eating well. Foods contain many substances, which are not found in pills. There is no specific vitamin that will cure HIV and AIDS. Vitamin pills are simply an addition to a healthy eating pattern.

However, in settings where these intakes and status cannot be achieved, multiple micronutrient supplements may be needed. Pending additional information, micronutrient intakes at one RDA level are recommended for HIV-infected individuals.

National Department of Health recommendations on Vitamin A, Iron, Folate and Zinc are unchanged and are the same for HIV-infected individuals as for uninfected.

Vitamin A

- Daily vitamin A intake by HIV-Infected women during pregnancy and lactation should not exceed the RDA.

- All women should receive a single dose of vitamin A as soon as possible after delivery and not later than 6-8 weeks after delivery.

- Children should receive vitamin A from 6 to 60 months at six months intervals. Non-breastfed babies from 0-5 months should also receive vitamin A.

- Children suffering from clinical vitamin A deficiency are high-risk cases. Vitamin A therapy significantly reduces the severity and case fatality rate of measles. The table below shows the vitamin A dosages and schedules.
Table 2: Vitamin A Supplementation Protocol

<table>
<thead>
<tr>
<th>Target group</th>
<th>Dosage</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-breastfed infants 0 - 5 months</td>
<td>50,000 IU</td>
<td>A single dose at the age of 6 weeks</td>
</tr>
<tr>
<td>All infants 6 - 11 months</td>
<td>100,000 IU</td>
<td>A single dose at the age of 6 months or up to 11 months</td>
</tr>
<tr>
<td>All children 12 - 60 months</td>
<td>200,000 IU</td>
<td>A single dose at 12 months and then every 6 month until 60 months</td>
</tr>
<tr>
<td>All post-partum women</td>
<td>200,000 IU</td>
<td>A single dose at delivery (NOT later than 6-8 weeks after delivery)</td>
</tr>
</tbody>
</table>

Folate and Iron

To prevent anaemia, it is recommended that daily iron-folate supplementation be given (according to Maternity Care Guidelines), and to treat severe anaemia the supplements should be given twice daily. Available data do not support a change in this recommendation for women living with HIV. Outside of this timeline and population, iron and folate should only be given if iron deficiency can be demonstrated e.g. decreased MCV or iron studies.

Micronutrient supplementation in children

- HIV infected children should receive micronutrient supplements at the 1 RDA level. There is inadequate evidence for recommendation of high dose micronutrient supplementation for children who are exposed to HIV or infected by HIV.
- Any Multiple Micronutrient Supplement targeted for people living with HIV and AIDS should not go beyond the current recommendation of RDA.

Zinc supplements

Zinc should be given to HIV-infected children with diarrhoea (acute, persistent or dysentery) in the same way as to HIV uninfected children i.e. <6 months 10mg daily for 2 weeks, ≥6 months 20mg daily for 2 weeks.

3.9 Dietary Management of Common Problems of HIV and AIDS

Annexure 5 provides nutrition information and suggestions for improved dietary practices for adults coping with HIV and AIDS-related symptoms. The goal of dietary management of the HIV and AIDS-related symptoms is to prevent malnutrition and improve overall health and nutritional status of PLWHA, thus slowing the progression of the disease and improving their quality of life.
4 Nutrition and Modern Therapies

People infected with HIV may take various modern medications, including antibiotics to treat opportunistic infections; ARVs to treat HIV and AIDS; and anti-malarial, anti-helminthes, anti-TB and anti-fungal medications to treat other conditions such as malaria, intestinal parasites, TB and thrush. Often, these medications interact with specific nutrients or types of foods and have a positive or negative impact on health and nutritional status. It is against this background that PLWHA become aware of some of the possible effects brought about by the interaction of drugs and food and nutrition. This section is intended to provide practical nutritional advice on how to manage effects of nutrient/food and drug interactions.

Interaction of drugs and food can affect the medication’s efficiency, nutritional status of the individual, and adherence to drug regimens

4.1 Counselling Clients about Food and Nutrition Implications of ARVs

- Explain the benefits of good nutrition for PLWHA who are on ARVs.
- Explain how HIV affects the nutrition of PLWHA.
- Explain that there may be interactions between food and ARVs.
- Ask the client if s/he knows the drugs s/he is taking. Explain that knowing the drugs helps to ensure the client complies with the recommended timing and dosage. It also helps in making a daily routine for taking drugs and meals to maximize effectiveness of the drugs, ensure good nutrition, and minimize side effects. Explain the dietary recommendations for each of the drugs the client is taking.
- Emphasize the importance of using clean and safe water when taking medicines.
- Explain to clients that taking some drugs may lead to side effects that may affect food intake or nutrition.
- Explain to the client the importance of telling health care personnel about side effects. These may be a sign of an opportunistic infection or other problems requiring medical treatment.
- Explain that most side effects of ARVs can reduce food intake and utilization by the body. This may weaken one’s nutritional status.
- Explain that some clients experience increased appetite, which can lead to weight gain. The weight gain may or may not be desired depending on the client’s body weight.
- Discuss simple dietary actions that can be taken to alleviate some common symptoms and side effects. Refer to Annexure 5.
- Explain that not all symptoms experienced are due to ARVs or other drugs. Presence of some symptoms may be due to HIV infection or opportunistic infections. For example, diarrhoea may be caused by a bacterial infection. In this case, nutritional management is the same, but medical care should be sought for the underlying infection immediately.
4.2 Nutrition and other Drugs

- TB is an opportunistic infection that affects high percentage of PLWHA in resource limited settings. The TB medication isoniazid inhibits the metabolism of vitamin B6, which is important for the metabolism of fats and proteins. Therefore, vitamin B6 supplementation is recommended.
- The antibiotic and anti-TB medication rifampicin may increase vitamin D metabolism, resulting in weakened bones. Therefore, vitamin D supplementation may be required. Treatment of TB should be accompanied by a vitamin B6 or vitamin D supplement, depending on the type of antibiotic used.

Table 3 gives information on recommended food intake and side effects of ARVs and other medications.

<table>
<thead>
<tr>
<th>Medication</th>
<th>Food Recommendations/ What to Avoid</th>
<th>Possible Side effects</th>
<th>Possible Actions to Manage Effects of ARVs - Food and Nutrition Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARV Class: Reverse Transcriptase Inhibitors</td>
<td>ARV Type: Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nevirapine (NVP)</td>
<td>Can be taken without regard to food.</td>
<td>Nausea, vomiting, rash, fever, headache, fatigue, Stomatitis, abdominal pain, drowsiness, paresthesia, High hepatotoxicity.</td>
<td>Change or loss of taste: Use flavour enhancers such as herbs, spices or lemon. Chew food well and move around in mouth to stimulate receptors.</td>
</tr>
<tr>
<td>ARV Class: Reverse Transcriptase Inhibitors</td>
<td>ARV Type: Nucleoside Reverse Transcriptase Inhibitors (NRTI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abacavir (ABC)</td>
<td>Can be taken without regard to food.</td>
<td>Nausea, vomiting, fever, allergic reaction, anorexia, abdominal pain, diarrhoea, anaemia, rash, hypotension, Pancreatitis, dyspnoea, weakness, insomnia, cough, headache.</td>
<td>Constipation: Eat foods high in fibre content. Drink plenty of liquids. Avoid processed or refined foods. Exercise regularly according to capacity.</td>
</tr>
<tr>
<td>Didanosine (ddl)</td>
<td>Take 30 minutes before or two hours after eating. Take with water only (Taking with food reduces absorption). Avoid: Do not take with juice. Do not take with antacids containing aluminium or Magnesium.</td>
<td>Anorexia, diarrhoea, nausea, vomiting, pain, headache, weakness, insomnia, rash, dry mouth, loss of taste, constipation, Stomatitis, anaemia, fever, dizziness, Pancreatitis.</td>
<td>Diarrhoea: Drink plenty of fluids. Continue eating during and following illness. Prepare and drink rehydration solution regularly. Avoid fried foods.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fever: Drink plenty of fluids. Eat energy and nutrient dense foods.</td>
</tr>
<tr>
<td>Medication</td>
<td>Food Recommendations/What to Avoid</td>
<td>Possible Side effects</td>
<td>Possible Actions to Manage Effects of ARVs - Food and Nutrition Interactions</td>
</tr>
<tr>
<td>---------------------</td>
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<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lamivudine (BTC)</td>
<td>Can be taken without regard to food. Avoid: Alcohol.</td>
<td>Nausea, vomiting, headache, dizziness diarrhoea, abdominal pain, nasal, symptoms, cough, fatigue, Pancreatitis, anaemia, insomnia, muscle pain, rash.</td>
<td>Flatulence: Avoid gas-forming foods, such as bean cabbage, broccoli and cauliflower.</td>
</tr>
<tr>
<td></td>
<td>Can be taken without regard to food. Limit the consumption of alcohol.</td>
<td>Nausea, vomiting, diarrhoea, peripheral neuropathy, chills and fever, anorexia, Stomatitis, anaemia, headaches, rash, bone marrow suppression, pancreatitis. May increase the risk of lipodystrophy.</td>
<td>High blood cholesterol: Eat a low fat diet and limit intake of foods rich in cholesterol and saturated fat. Eat fruits and vegetables daily. Exercise regularly according to capacity.</td>
</tr>
<tr>
<td>Stavudine (D4T)</td>
<td>Take with meal.</td>
<td>Abdominal pain, headache, fatigue, dizziness.</td>
<td>High Triglycerides: Limit sweets and excessive carbohydrate and saturated fat intake. Eat fruits vegetables, and whole grains daily. Avoid alcohol and smoking. Exercise regularly according to capacity.</td>
</tr>
<tr>
<td>Tenofovir (TDF/3TC)</td>
<td>Better to take without food, but it causes nausea or stomach problems, take with a low fat meal. Do not take with a high fat meal. Avoid: Alcohol.</td>
<td>Anorexia, anaemia, nausea, vomiting, bone marrow suppression, headaches, fatigue, constipation, dyspepsia, fever, dizziness, dyspnoea, insomnia, muscle pain, rash.</td>
<td>Nausea or vomiting: Eat small quantities of food at frequent intervals.</td>
</tr>
<tr>
<td>Zidovudine (3TC/3TC)</td>
<td>Take on an empty stomach one hour before or two hours after meal.</td>
<td>Nausea, abdominal pain, headache, kidney stones, taste changes, vomiting, regurgitation, diarrhoea, insomnia, ascites, weakness dizziness. May increase the risk of lipodystrophy.</td>
<td>Drink water after meals and limit intake of fluids with meals. Avoid having an empty stomach. Avoid lying down immediately after eating. Eat lightly salty and dry foods to calm the stomach. Rest between meals.</td>
</tr>
<tr>
<td>ARV Class: Protease Inhibitors</td>
<td></td>
<td>Abdominal pain diarrhoea, headache, weakness, nausea. May increase the risk of diabetes.</td>
<td></td>
</tr>
<tr>
<td>Indinavir (IDV)</td>
<td>Can be taken without regard to food. Avoid: St John's Wort.</td>
<td>Diarrhoea, flatulence, nausea, abdominal pain rash. May increase the risk of lipodystrophy.</td>
<td></td>
</tr>
<tr>
<td>Lopinavir (LPV)</td>
<td>Take with a meal or light snack. Taking with acidic food or drink will cause a bitter taste. Avoid: St John's Wort.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relfinavir (NFV)</td>
<td>Take with a meal if possible. Avoid: St John's Wort.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ritonavir (RTV)</td>
<td>Take with a meal if possible. Avoid: St John's Wort.</td>
<td>Nausea, vomiting, diarrhoea, hepatitis, jaundice, weakness, anorexia, abdominal pain, fever, diabetes, headache, dizziness. May increase the risk of lipodystrophy.</td>
<td></td>
</tr>
</tbody>
</table>
### Medication Recommendations/What to Avoid

<table>
<thead>
<tr>
<th>Medication</th>
<th>Possible Side effects</th>
<th>Possible Actions to Manage Effects of ARVs - Food and Nutrition Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Saquinavir (SQV)</strong></td>
<td>Mouth ulceration, taste changes nausea, vomiting, abdominal pain, diarrhoea, constipation, flatulence, weakness, rash, headache, and insomnia. May increase the risk of lipodystrophy.</td>
<td></td>
</tr>
<tr>
<td><strong>TB MEDICATIONS</strong></td>
<td></td>
<td>Daily consumption of food sources of vitamin B6 such as white beans, avocado, meat and fish are recommended.</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>Nausea, vomiting, diarrhoea, loss of appetite.</td>
<td></td>
</tr>
<tr>
<td>Isoniazid</td>
<td>Anorexia, diarrhoea.</td>
<td></td>
</tr>
<tr>
<td><strong>THRUSH MEDICATIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluconazole</td>
<td>Nausea, vomiting, diarrhoea.</td>
<td></td>
</tr>
<tr>
<td>Nystatin</td>
<td>Infrequent occurrence of diarrhoea, vomiting, nausea.</td>
<td></td>
</tr>
<tr>
<td><strong>MALARIA MEDICATIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quinine</td>
<td>Abdominal or stomach pain, diarrhoea, nausea, vomiting, lower blood sugar.</td>
<td></td>
</tr>
<tr>
<td>Chloroquine</td>
<td>Stomach pain, loss of appetite, nausea, vomiting.</td>
<td></td>
</tr>
</tbody>
</table>

### 4.3 Nutritional Management of Adverse Effects of ARVs

Many changes take place in people who are taking ARVs and living longer. Some people experience the following metabolic changes after being on ARVs:

#### 4.3.1 Lipodystrophy

- A condition known as “lipodystrophy syndrome”. The term lipodystrophy refers to any problem in processing of fat. In HIV this refers to changes in how fat is distributed in the body and changes in ways fats and sugars are metabolized in the body.
- Lipodystrophy is thought to be due to changes of certain hormones that are found in the body or just living longer with a lower viral load. It has also been found to occur in various degrees when taking protease inhibitors and non-nucleoside reverse transcriptase classes of ARVs.
• Fat may be deposited around the organs in the stomach, as referred to in literature, (also referred to as “protease pouch, or abdominal, visceral, central or truncal fat or obesity”).
• Fat may be lost from the face, arms, legs and buttocks. Cheeks may appear sunken, and muscles and veins may be more easily visible.
• Fat may build up on the back of shoulders and neck referred to as “buffalo hump”, or little bumps can occur under the skin anywhere on the body.

4.3.2 Changes in blood lipid profile

• A blood lipid profile is a lab test showing the different types and levels of fat in the blood.
• Cholesterol and triglycerides are blood lipids that are elevated/affected in people taking combination therapies of ARVs.
• A high lipid level over time can lead to increased risk of heart disease or pancreatitis (an inflamed pancreas).

Possible actions to be taken
• Reduce total amount of fat eaten daily and rich gravies and sauces, mayonnaise and desserts must be avoided.
• Avoid frying and bake or boil foods instead.
• Use less fat (saturated fat) including whole milk products and stick margarines, rather use tub-soft margarines and low-fat dairy product.
• Remove all visible fats from meat including chicken skin before cooking.
• Increase fibre rich foods as found in most indigenous foods, mabele Jugo/African beans and in fruit and vegetables.
• Alcohol should be discouraged.
• Add soluble fibre like beans, and whole grains like bean and dry cereal indigenous snacks.
• Advise on regular exercise.
• Refer to a dietitian for further management.

4.3.3 Changes in blood sugar levels

• An increase in insulin resistance and blood sugar levels may be noted in lipodystrophy syndrome. Some people may develop diabetes, high blood sugar levels that must be controlled.
• Insulin resistance within the context of HIV and AIDS occurs when the body does not respond to insulin. This is a hormone that normally lowers sugar in the blood by stimulating use of glucose in the muscle and fat, by decreasing how much glucose is produced in the liver. Insulin resistance needs to be tracked down over a period of time.

Actions recommended
• Advise regular schedule of eating.
• Small frequent meals containing small amounts of kilojoules and nutrients needs daily.
• Encourage the use of sugar substitutes such as artificial sweeteners.
• Avoid the use of sweets and sugar rich foods.
• Encourage exercise and maintaining a healthy weight.
• For further management refer to a dietitian.
5 Herbal Treatments and Remedies

The information presented in this chapter is based on knowledge gained from people living with HIV and AIDS about useful herbal treatments and remedies. It does not claim that all herbs and remedies have the same effect on all people. Many traditional approaches are not well documented and their nutritional effects are mostly unknown. Whatever treatment is used, maintaining good nutrition is still important as it helps to build a strong immune system.

5.1 Nutrition actions to support people interested in herbal treatments and other remedies

- Health care personnel should be familiar with the various herbs and traditional therapies that PLWHA may be taking or using and advise them of any harmful effects these may have on their health.
- PLWHA should be advised to always discuss treatments with health care personnel and avoid any treatment or practice, such as fasting, which cause weight loss.
- PLWHA may use herbs and spices as long as they are not harmful and do not interact with medication the patient may be taking to treat other infections. Herbs and spices can help improve digestion, give appetite and preserve food.
- Spices may be used to enhance the flavor of food, stimulate appetite and assist to manage taste changes that can occur in HIV disease or as a side effect of medication.
- However, caution should be given to PLWHA about various herbs that may be sold claiming to cure HIV. All herbs and spices should be used in moderation.

A list of herbs and spices, and their beneficial effects are given in Table 4 below:

Table 4: Commonly used herbs and spices

<table>
<thead>
<tr>
<th>Name</th>
<th>Benefits</th>
<th>How to use</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aloe Vera</td>
<td>Relieves constipation. Soothing and healing of wounds.</td>
<td>Use as extract from chopped leaf: boil and drink the concentrated water. Apply fresh gel to wounds.</td>
<td>Use limited amounts for a maximum of 10 days. May cause diarrhea. Avoid in pregnancy.</td>
</tr>
<tr>
<td>Basil</td>
<td>Relieves nausea. Assist in digestion and acts as an antiseptic for mouth sores.</td>
<td>Make tea - one teaspoon of leaves to a cup of boiling water and drink 3 times a day. Add fresh or dry leaves to food. For mouth sores - gargle the tea.</td>
<td></td>
</tr>
<tr>
<td>Lessertia (Sutherlandia)</td>
<td>For strengthening immunity and preventing diarrhea.</td>
<td>Make a tea by pouring boiling water onto half a teaspoon of powdered dry leaves in a cup. Drink when cool.</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Benefits</td>
<td>How to use</td>
<td>Caution</td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>Cayenne pepper</td>
<td>Stimulates appetite.</td>
<td>Add a pinch to cooked or raw food, drinks or water.</td>
<td>Not to be used in cases of gastric hyperacidity, peptic ulceration or on mucous membrane. Wash hands after use to avoid accidental eye or mucous membrane irritation.</td>
</tr>
<tr>
<td>Capsicum spp</td>
<td>Assist in digestion. Good general tonic for digestive and circulatory systems. Antiseptic.</td>
<td>Make tea - one teaspoon dry flowers or leaves to a cup of boiling water and drink 3 times a day. Steam inhalation for inflamed mucous membranes of the head and throat.</td>
<td></td>
</tr>
<tr>
<td>Chamomile</td>
<td>Relieves nausea. Aids digestion. Stimulates appetite. Soothing harmless sedative. Anti-inflammatory. Antiseptic.</td>
<td>Add to meals or tea 1/4 teaspoon (level) each of powdered cinnamon, sage, ginger, garlic, rosemary and cloves mixed to make a tea is good for colds and digestion - take once or twice a day.</td>
<td>Avoid cinnamon in pregnancy.</td>
</tr>
<tr>
<td>Chamomilla recutita (L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cinnamon</td>
<td>Relieves nausea. Aids digestion. Stimulates appetite. Antidiarrhoeal. Antiseptic. Good for colds and flu.</td>
<td>Add half a teaspoon in a half a cup of warm (not boiling) water.</td>
<td>Use limited amounts and not for more than three months.</td>
</tr>
<tr>
<td>Cinnamon zeylanicum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African potato (hypoxis)</td>
<td>Strengthen the immune system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coriander</td>
<td>Helps to increase appetite and reduce flatulence. Controls bacteria and fungi.</td>
<td>Add herb to meals.</td>
<td></td>
</tr>
<tr>
<td>Lemons and lemon juice</td>
<td>Helps with food absorption (pectin). To aid the alkalising system. May act against herpes and shingles.</td>
<td>Drink the juice of one whole lemon (in water) every day. Either use fresh lemons, or pure lemon juice. Two tablespoons of pure lemon juice is equivalent to one whole lemon.</td>
<td></td>
</tr>
<tr>
<td>Honey</td>
<td>For healing wounds, and as an antiseptic.</td>
<td>Put a little honey directly into the sore or wound, and cover it. Wash it gently and replace the honey every four to five hours.</td>
<td></td>
</tr>
<tr>
<td>Garlic</td>
<td>Helps soothe symptoms of thrush, mild diarrhoea and headaches. It is a natural antibiotic and anti-fungal.</td>
<td>Add to meals in small amounts. Take at least two to three cloves per day.</td>
<td>People who are taking Ritonavir or Saquinavir should not take garlic at the same time, as these substances may affect the absorption of the drugs.</td>
</tr>
<tr>
<td>Tea made from lemon leaves, guava leaves</td>
<td>Used to treat sore throat and cough.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ginger</td>
<td>Used for colds and sore throats.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6 Nutritional Care and Support for Pregnant and Lactating Women with HIV

6.1 Pregnancy and Nutrition

During pregnancy the maternal requirements for protein, folate, niacin, zinc, iron and iodine in particular are 30-50% higher than before pregnancy. During the first half of pregnancy, extra nutrients are primarily required for the increase in maternal tissues, such as expansion of blood and extra cellular fluid volume, enlargement of the uterus and mammary tissue and fat deposition. During the third trimester the additional nutrients are used by the foetus mainly for rapid growth and storage.

Poor weight gain during pregnancy reflects maternal malnutrition. The effect of poor nutrition on maternal and infant morbidity and mortality in HIV-negative mothers is well documented. Poor nutritional status before and during pregnancy has been associated with intrauterine growth retardation, low birth weight and premature delivery conditions. These events are also associated with maternal HIV infection.

HIV-positive women in developing countries are particularly vulnerable to nutrient deficiencies because of likely inadequate dietary intake and potentially increased nutrient requirements associated with HIV and other infections and the nutritional demands of pregnancy. For most mothers in early stages of the HIV disease, pregnancy does not appear to accelerate disease progression. Requirements for many nutrients such as energy; vitamins A, C and E; riboflavin and vitamin B₁₂, and minerals iodine, selenium and zinc are considerably higher during lactation than during pregnancy and are proportional to the intensity and duration of breastfeeding. There is limited understanding of the effect of lactation on the immune system of HIV negative women and none on that of HIV-positive women.

Nutritional care and support for the pregnant and lactating women infected with HIV may minimize the impact of the disease, delay disease progression and allow them to remain productive and able to take care of themselves and their families.

6.2 Nutritional Care and Support for Pregnant and Lactating Women Infected with HIV

- Pregnant and lactating women, who are at risk of HIV infection, should be counselled on the need for early diagnosis of HIV infection, if they do not already know their status. This will help them take care of themselves more thoroughly so as to minimize the impact of HIV on the woman’s nutritional status.
- Every HIV+ pregnant or lactating mother should have an antenatal card to record weight changes during pregnancy.
- Weight gain should be monitored every time when pregnant women come to the clinic. Women should gain about one kilogram per month in the second and third trimesters of pregnancy. When women do not attend antenatal care sessions on a monthly basis, weight gain during the interval between visits can be calculated and converted to assess whether the rate was at least one kilogram per month.
- As with uninfected women those gaining less than one kilogram per month in the second and third trimester should be referred to a hospital immediately where they can receive more care.
- If the weight gain is below the recommended range at the end of the pregnancy, nutrition assessment should be carried out as this may indicate a possible problem. Some examples of possible problems include inappropriate energy intake, food insecurity and opportunistic infection.
- Table 5 gives an example of food requirements for a 19-year-old HIV infected pregnant woman at different stages of the disease.
- During pregnancy and lactation there is an increase need of the following nutrients: calcium, iron, vitamin C and folic acid. Preference should be given to foods rich in these nutrients. See Annexure 1.

### TABLE 5: Recommended amounts of foods for pregnant and lactating women

<table>
<thead>
<tr>
<th>Recommended foods</th>
<th>Adult woman (19 years)</th>
<th>Pregnant woman (Second half of pregnancy)</th>
<th>Lactating woman</th>
<th>HIV infected woman (Asymptomatic / Symptomatic)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1 800Kcal/7 500KJ)</td>
<td>(2 240Kcal/9 400 KJ)</td>
<td>(2 640 Kcal/11 000 KJ)</td>
<td>20%(+2 000KJ) to 30%(+3 000KJ)</td>
</tr>
<tr>
<td>Starchy foods</td>
<td>6 to 8 servings</td>
<td>8 to 10 servings</td>
<td>10 to 12 servings</td>
<td>12 to 16 servings*</td>
</tr>
<tr>
<td>Vegetables and fruit</td>
<td>5 servings</td>
<td>servings</td>
<td>5 servings</td>
<td>5 servings</td>
</tr>
<tr>
<td>Chicken, meat, fish, eggs and dry beans, split peas, lentils and Soya and Milk, yoghurt or cheese</td>
<td>2 - 3 servings 250 ml (1 cup)</td>
<td>3 servings 500 ml (2 cups) - 650 ml (1/2 cups)</td>
<td>3 servings 500 ml (2 cups) - 650 ml (1/2 cups)</td>
<td>3 servings 500 ml (2 cups) - 650 ml (1/2 cups)</td>
</tr>
<tr>
<td>Margarine, butter or oil</td>
<td>30ml</td>
<td>30ml</td>
<td>30ml</td>
<td>50 ml to 70 ml</td>
</tr>
<tr>
<td>Drink lots of clean, safe water</td>
<td>8 glasses</td>
<td>&gt; 8 glasses</td>
<td>&gt; 8 glasses</td>
<td>&gt; 8 glasses</td>
</tr>
</tbody>
</table>

*100g enriched instant supplementary drink will supply approximately 2 000 KJ (60g CHD equal to 4 starchy servings, 14 to 20 gram Protein equal to 1 serving meat, fish, chicken and 10g fat equal to 2 fat servings)

### Examples of one serving:

#### Starchy foods
- 1 slice of bread (30g)
- ½ cup cooked maize porridge or rice or pasta
- ¼ cup cooked putu
- ½ hamburger roll
- 1 medium potato

#### Vegetables and fruit
- 1 medium fruit (Size of tennis ball)
- ½ cup fruit or vegetables

#### Meat
- 75 - 100g cooked chicken, fish, meat (without bone)
- 150g Soya burger
- 2 eggs
- 4 tablespoons peanut butter
- 2/3 to 1 cup nuts

#### Legumes
- 1 cup legumes

#### Milk
- 1 cup milk or yoghurt
- 40 - 50g cheese
6.3 Micronutrient Supplementation

Improving micronutrient status is an important step to reducing maternal malnutrition. This can be achieved through diet diversification, micronutrient supplementation and food fortification.

- There is no need for additional micronutrients for HIV infected pregnant and lactating women.
- Women should receive micronutrient supplements as part of their care and treatment programmes and at 1 RDA.
- Multiple micronutrient supplements should be provided for all pregnant women who know that they are infected with HIV. This will help meet increased nutrient needs caused by the HIV infection and may reduce the risk of poor pregnancy outcome.

6.3.1 Vitamin A supplementation

**High dose Vitamin A supplements should not be given to pregnant women. They can cause birth defects if given during pregnancy**

Lactating women should be provided with a high dose Vitamin A capsule (200,000 IU) to prevent vitamin A deficiency. This provision should be made as soon as a woman delivers, and no later than 8 weeks after giving birth.

6.3.2 Iron and Folic acid supplementation

In HIV infection, anaemia is common but not always associated with low intake of iron. Excessive amounts of iron may contribute to HIV disease progression. However, all pregnant women including HIV positive pregnant women should receive iron supplementation to prevent anaemia. The table below shows the recommended iron protocol for South Africa.

**TABLE 6: Recommended Iron protocol for South Africa using ferrous sulphate tablets (200 mg containing 60 mg iron)**

<table>
<thead>
<tr>
<th>Prevention</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Hb ≥10 g/dl)</td>
<td>(Hb 7.0 - 9.9 g/dl)</td>
</tr>
<tr>
<td>200mg (1 tablet daily)</td>
<td>200 mg x 2 (1 tablet 2 times a day)</td>
</tr>
</tbody>
</table>


7 Nutritional Care and Support for Infants and Children infected and exposed to HIV and AIDS

7.1 Ways in which Children get Infected with HIV

- Most HIV infection in children occurs through mother to child transmission (pregnancy, labour, or breast feeding).
- Transmission by blood transfusion. This is rare as long as transfused blood is carefully screened.
- Sexual abuse.
- Needles and syringes that have not been sterilised sufficiently and scarification.
- Wet-nursing with HIV-contaminated breast-milk.

7.2 Effects of HIV on Children

- Children born to HIV positive mothers are more likely to be born with low birth weight compared to children born to HIV negative mothers. They are more susceptible to common childhood illnesses such as diarrhoea, acute respiratory infection (ARI), recurrent fever, and neurological problems.
- They are more likely to experience growth failure and malnutrition as they grow because of poor appetite, swallowing difficulties, and nausea.

Children born to HIV positive mothers need special attention to ensure that they receive adequate amounts of nutrients. They also need special care and support.

7.3 Feeding Infants 0-6 Months Born to HIV Positive Mothers

It is important that mothers know their HIV status so as to choose the most appropriate feeding option. If the mother is HIV+ she should be provided with the correct information for her to make the best feeding choice for the health of her child in order to reduce the risk of mother to child transmission of HIV.

7.3.1 The recommended feeding options for infants 0-6 months

There are only two recommended feeding options for the HIV positive mother. These are Exclusive Breastfeeding or Exclusive Replacement Feeding. Exclusive breastfeeding is when the baby is fed breast milk ONLY (without giving water or any other liquids, foods and medicines unless medically indicated) for a period of 6 months. Exclusive replacement feeding (exclusive formula feeding) means that the baby is given alternative feeds like infant formula. No breast milk is given. Table 7 gives the benefits and risks of the two recommended feeding options.
Feeding Choices NOT Recommended

Mixed feeding or giving breast-milk AND other feeds. Mixed feeding increases the risk of HIV transmission through breastfeeding.
Wet nursing is discouraged because of the risk of HIV transmission if the wet nurse is HIV-positive or becomes HIV-positive.

**TABLE 7: The benefits and risks of Exclusive Breastfeeding (EBF) and Exclusive Replacement Feeding**

<table>
<thead>
<tr>
<th>BENEFITS OF EXCLUSIVE BREASTFEEDING</th>
<th>RISKS OF EXCLUSIVE BREASTFEEDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Breast milk contains all the nutrients, (energy, proteins and micro-nutrients) including water that the baby needs to grow.</td>
<td>HIV can be passed to the infant through the breast milk. The risk of HIV transmission through breastfeeding is increased by:</td>
</tr>
<tr>
<td>- Breast milk provides antibodies and vitamins to protect the baby from infections.</td>
<td></td>
</tr>
<tr>
<td>- Breast milk stabilises the intestinal mucosa. This prevents transmission of HIV to the infant. However, this protection is reduced if any other substance, even water, is fed to the infant during this phase of exclusive breastfeeding.</td>
<td></td>
</tr>
<tr>
<td>- Breast milk is easy to provide to the child, and less costly.</td>
<td>- High RNA viral load in plasma and or breast milk.</td>
</tr>
<tr>
<td>- Breast feeding gives emotional benefits to the mother and baby.</td>
<td>- Certain breast conditions like crack(s) or a deep fissure on the nipples, bleeding nipple(s), sub-clinical or clinical mastitis or breast abscess.</td>
</tr>
<tr>
<td>- Breast feeding has contraceptive benefits for the mother.</td>
<td>- Certain micronutrient deficiencies, such as Vitamin A deficiency in those mothers who are nutritionally and immunologically compromised.</td>
</tr>
<tr>
<td>- Breast milk is always available, while substitutes may not be.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BENEFITS OF EXCLUSIVE REPLACEMENT FEEDING</th>
<th>RISKS OF EXCLUSIVE REPLACEMENT FEEDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Replacement feeding reduces the risk of transmission of HIV from the mother to the infant</td>
<td>- There is a higher risk of other non-HIV infections for the infant.</td>
</tr>
<tr>
<td></td>
<td>- Other foods do not transfer the mother's protective antibodies and vitamins.</td>
</tr>
<tr>
<td></td>
<td>- Baby formula and foods are expensive. Fuel for boiling the water and making the food can also be expensive.</td>
</tr>
<tr>
<td></td>
<td>- If the baby formula and foods for the baby are not prepared properly, they can cause diseases that lead to malnutrition.</td>
</tr>
<tr>
<td></td>
<td>- If the mother does not breastfeed, it may displease other family members making life more stressful for her. It may also draw attention to her HIV positive status and may increase stigma for the infected mother.</td>
</tr>
</tbody>
</table>

After assessing each HIV infected mothers individual circumstances regarding feeding choices, and providing her with information through counselling, **IT IS IMPORTANT TO SUPPORT MOTHERS IN THE FEEDING OPTION THEY MAY CHOOSE.**
7.4 Support for mothers in their different feeding choices

7.4.1 Exclusive breast feeding choice (EBF)

If the mother chooses the *exclusive breast feeding option* she can be supported and helped to apply exclusive breastfeeding (EBF) in the following ways:

- The mother should be counselled on the importance of continuing EBF without fluids or foods for about 6 months.
- The mother should be supported to make breastfeeding safer by showing her good breastfeeding techniques. These help to reduce the risk of transmission of HIV to the baby as they reduce the risk of cracked nipples and mastitis. *Cracked nipples and mastitis are associated with transmission of the virus to the baby during breastfeeding.*
- The mother should be counselled on how to solve common difficulties including insufficient milk, sore/cracked nipples, engorgement, manual expression and storage.
- Mothers should be shown how to express and discard milk from cracked nipples and from breast(s) affected by sores, nipple trauma, engorgement and mastitis.
- During each contact, a mother’s wish to start giving other feeds to the baby should be explored. For mothers who want to start feeding other foods besides breast milk, they should be counselled on the importance of exclusive breastfeeding or exclusive replacement feeding for the first 6 months and to avoid mixing the two.
- It is recommended that HIV positive mothers, who are exclusively breast feeding should change to exclusive replacement feeding when the baby is 6 months of age. *(Information on how mothers can manage the transition from breastfeeding to replacement feeding is provided in the following section).*

---

### Safe Transition

**Step 1:**

**Understand stopping BF around 6 months as part of the overall strategy to avoid HIV transmission.**

Ensure that the family understand why breastfeeding will be stopped around 6 months as part of the overall strategy to avoid HIV transmission while still gaining the maximum benefit of breastfeeding, especially in communities that cannot support safe replacement feeds.

**Step 2:**

**Prepare the baby for stopping breastfeeding.**

- From an early stage use expressed breastmilk in a cup so that the infant becomes familiar with the cup. It will not be strange when it is used to feed after 6 months.
- From an early stage, regularly comfort the infant with methods other than breastfeeding e.g. massage.
- Plan how to comfort the infant in public places e.g. on the bus, once breastfeeding stops.
Step 3: Prepare the family for stopping breastfeeding. Explain to a close family member, or even better the whole family, why breastfeeding will be stopped around 6 months and how they can help with comforting the child at the actual time of stopping breastfeeding e.g. holding and comforting infant so that mother does not have to be the only one trying to comfort infant if upset.

Step 4: Manage any breast health difficulties. Stopping breastfeeding may result in engorgement of the breasts, or even mastitis. Teach mother how to deal with these and not to feed the infant as a way of relieving discomfort.

Step 5: Look after the infant's nutritional needs. Make a plan regarding the food for the child and make sure that it is adequate both in energy and also vitamins and iron. (See the Guiding Principles on feeding non-breastfed child)

7.4.2 Exclusive replacement feeding choice

Replacement feeding options recommended for infants between the ages of 0-6 months

- Commercial infant formula: this requires water, fuel, utensils, skills and time to prepare it accurately and hygienically. An infant will require a total of approximately 20kg of formula to feed for 6 months.
- Home-prepared formulas: these are made from animal milk (cow, goat, or sheep), powdered milk or evaporated milk. (Refer to the Infant and Young Child Feeding Implementation Guidelines for more information).

Cereal feeds, juices and teas are not suitable for replacement feeds before the infant is 6 months of age

If the mother chooses the exclusive replacement feeding option: (Infant formula feeding or home-prepared formula)

- It is essential to first check if she is able to follow through with this option. This can be done by checking to see if exclusive replacement feeding is Acceptable, Feasible, Affordable, Sustainable and Safe (AFASS) for the mother.
- All mothers or caregivers who choose exclusive replacement feeding should be shown how to prepare the feed of their choice safely and accurately.

Use the information in the following table to check the AFASS criteria for exclusive replacement feeding
### TABLE 8: Follow-through with Exclusive Replacement Feeding

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>Questions to ask to see if mother is able to follow through with Exclusive Replacement Feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptability</td>
<td>Are there cultural or social reasons that could create a problem if the mother were to choose replacement feeding?</td>
</tr>
<tr>
<td>Is ERF acceptable for the mother?</td>
<td>Does the mother have fear of stigma or discrimination if she were to choose replacement feeding?</td>
</tr>
<tr>
<td>Feasibility</td>
<td>Does the mother or caregiver have enough time, knowledge, skills, resources and support to correctly prepare breast-milk substitutes? Is she able to feed the infant 8-12 times in 24 hours?</td>
</tr>
<tr>
<td>Affordability</td>
<td>Can the mother pay for the costs of buying, preparing, storing, the ERF without compromising the health and nutrition of the family? NOTE: Costs include those for ingredients/supplies, fuel, clean water, and medical expenses that may result from unsafe preparation and feeding practices.</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Will the mother be able to have a continuous, uninterrupted supply of replacement food (e.g. formula)? Will the mother have the products (e.g. ability to boil water) needed to safely practice ERF?</td>
</tr>
<tr>
<td>Safety</td>
<td>Will the mother be able to store the replacement food correctly and in a place that is hygienic? The mother should prepare and feed the ERF with clean hands, clean cups and other utensils, but not bottles or teats.</td>
</tr>
</tbody>
</table>

**What mothers should know and be able to demonstrate so as to prepare feeds safely and accurately:**

- **What volume and strength of feed to prepare - note that amounts change as the baby grows.**
- **How to use a clean cup rather than a bottle.**
- **The importance of clean water and clean containers. The water should be boiled and filtered.**
- **How often to feed the infant.**

7.4.3 What Health care personnel can do to assist the mother

- Assess any difficulties that the mother may have with exclusive replacement feeding (refer to Table 8). Address any problems she may have in the best possible way.
- Provide the mother with information on the risks of mixed feeding (breastfeeding and replacement feeding).
- Counsel the mother on appropriate feeding after the child is about 6 months of age (addition of complementary foods).
- Support the mother with the necessary skills and knowledge to properly feed the infant with appropriate replacement foods.
- Support and encourage the mother on the need for regular weighing and attendance to all well baby visits for monitoring of the infant's growth and development.
- Help the mother know when and where to seek medical care and other social support if the child has feeding problems or is ill.
- Provide all mothers using replacement feeding with multivitamins for the baby.
- Ensure that all children have received Vitamin A supplementation.

### 7.5 Feeding Children who are 6-24 Months of Age

- Babies from 6 to 24 months will need milk from sources other than breast milk.
- The child's diet should be reviewed at every visit to the clinic. Conditions that are affecting appetite and food intake should be discussed and treated as appropriate.
- Mothers should be advised on how to improve the diet, taking into consideration the child's age, local resources and the family's circumstances. Examples of nutritious locally available low-cost foods should be mentioned to the mother.

### Guiding principles for feeding non-breastfed children 6-24 months of age

- **Ensure that energy needs are met.** These are approximately 600 kcal per day at 6-8 months of age, 700 kcal per day at 9-11 months of age, and 900 kcal per day at 12-23 months of age.
- **Gradually increase food consistency and variety,** as the infant gets older, adapting to the infant's requirements and abilities.
- For the average healthy infant, **meals should be provided 4-5 times per day,** with additional nutritious snacks offered **1-2 times per day,** as desired.
- **Feed a variety of foods** to ensure that nutrient needs are met.
- **As needed, use fortified food or vitamin-mineral supplements that contain iron.** If adequate amounts of animal-source foods are not consumed, these fortified foods or supplements should also contain other micronutrients, particularly zinc, calcium and vitamin B12.
- **Non-breastfed infants and young children need at least 400-600 ml/day of extra fluid** (in addition to the 200-700 ml/day of water that is estimated to come from milk and other foods) in a temperate climate, and **800-1200 ml/day in a hot climate.** Plain, clean (boiled, if necessary) water should be offered several times per day to ensure that the infant's thirst is satisfied.
- **Practise good hygiene and proper food handling** by a) washing caregivers' and children's hands with soap before food preparation and eating, b) storing foods safely and serving foods immediately after preparation, c) using clean utensils to prepare and serve food, d) using clean cups and bowls when feeding children, and e) avoiding the use of feeding bottles, which are difficult to clean.
- **Practise responsive feeding,** applying the principles of psycho-social care, specifically: a)
feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; b) feed slowly and patiently, encourage children to eat, but do not force them; c) if children refuse many foods, experiment with different combinations, tastes, textures and methods of encouragement; e) minimize distractions during meals if the child loses interest easily; f) remember that feeding times are periods of learning and love - talk to children during feeding, with eye to eye contact.

- Increase fluid intake during illness and encourage the child to eat soft, varied, appetizing, favourite foods. After illness, give food more often than usual and encourage the child to eat more.

7.5.1 Steps that can be taken to improve the diet

To increase energy and nutrient intake of foods regularly eaten, mothers can be advised to:

- Feed children small regular meals 5-6 times per day.
- Give porridge and add to it any of the following: milk, oil, sugar, peanut butter, bean powder or soybean powder.
- **Bread, pap, samp, mealies and other cereals** should be eaten as much as the child wants, provided they are mixed with one of the above and/or sour milk to improve the food nutritionally.
- Provide at least 1 fruit and 1 vegetable every day. Mashed fruits and vegetables like ripe banana, avocados, and pumpkin are good examples.
- Home-cooked food is better than pre-cooked food in tins or packets. These are expensive and may not be very healthy. Take away foods like fried chicken are also expensive and may not be as healthy as home-cooked chicken.
- **For increase protein intake**, try to offer at least one portion per day of one of the following: fish, chicken, meat, dry beans, eggs, and peanut butter.
- Dry beans (sugar beans and brown beans) are also good protein sources that are cheaper than meat and should be eaten as often as possible.
- Milk is an important part of the child's diet. After 6 months, the child can drink boiled fresh milk (cow's or goats' milk). Children over 1 year of age should drink 2-3 glasses of fresh milk or full-cream powdered milk every day.
- Sweets, chocolates and crisps are allowed as a treat and in limited amounts, but should not be eaten in place of food. If these foods are eaten too often, the child will have no appetite for nutritious food such as those described above.

7.6 Other support measures for mothers to care for their HIV infected child

Mothers can be further supported by discussing with them the importance of using essential child health services. These include the following:

- Ensure that each child has a Road To Health Chart. These can be accessed at health facilities.
- Assess children for complete and up-to-date immunization. Immunize children whose immunization is not up-to-date.
Assess whether children are receiving vitamin A supplementation and dewormed every 6 months. If these have not been done in the last 6 months, provide the service or refer the child to where they can get services (Refer to Table 2 on page 24 for Vitamin A schedule).

Ensure that all immunizations and vitamin A supplementation have been recorded on the Road to Health Chart.

Counsel mothers about the importance of taking their children for regular growth promotion and monitoring.

All HIV exposed and or infected infants/children from 4-6 weeks of age and any child identified as HIV infected should receive Co-trimoxazole prophylaxis.

7.7 Severe Malnutrition Associated with HIV and AIDS

Severely malnourished children with HIV and AIDS are about five times more likely to die than uninfected children. Such children rarely respond to conventional nutritional rehabilitation and take much longer to recover. Management of severely malnourished children with HIV involves achieving high energy and nutrient intake to realize complete recovery. It is important to encourage caregivers take children for growth monitoring and seek health care and support for children who are not growing well so that they do not become severely malnourished.

7.7.1 What Health Care Personnel can do to diagnose and treat severe malnutrition

- Be aware of signs of severe malnutrition:
  a. Look out for visible severe wasting, especially of the trunk and buttocks.
  b. Look out for oedema (swelling) of both feet.
  c. Look for anemia, pallor of the palms.
  d. Weigh the child and plot the weight on the Road to Health Chart.
  (Refer to the IMCI guidelines on “Danger signs”)

- Check for and attend to complications that might lead to death:
  a. If the child has a very low body temperature (below 35°C), keep the child warm.
  b. If the child is dehydrated or has diarrhoea, give an oral rehydration solution to replace lost fluids.
  c. If the child has hypoglycemia (characterized by drowsiness and stupor), give a glucose solution (use intravenous fluids in moderation).
  d. Provide broad-spectrum antibiotics to all children with severe malnutrition.
  e. Start feeding children with foods that can provide 75 kcal per kg per day at least within two hours of admission.

- Counsel the caregivers on the need for referral and urgently refer children with severe malnutrition to the hospital.

- When in a hospital, severely malnourished children should be managed according to the following recommended guidelines: The South African Guidelines on Management of Severe Malnutrition and the protocol on nutritional care of HIV-infected children (6 months - 14 years).
After discharge:

- Encourage the caregivers to feed the child frequently with energy and nutrient-dense food.
- Encourage the caregivers to involve the child in play and stimulation in order to foster the child's development.
- Advise the caregivers to take the child for regular follow-up to ensure the child completes immunization, receives 6-monthly vitamin A, deworming and undergoes monthly growth monitoring.
- Severely malnourished children with HIV and AIDS who are not on ARVs should be referred to the accredited service points to be assessed for anti-retroviral therapy.

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Key steps to take in nutritional care of HIV infected children:

- Assess and classify the child's growth.
- Assess the child's nutritional needs.
- Decide on a nutritional care plan.
- Find out what the child eat and drink.
- Discuss who gives the child their food and how the child eats.
- Assess if there is food and income at home.
- Discuss exercise and avoid risk factors for malnutrition.
- Decide if to refer and when to review.
- Ensure that children with special needs are nutritionally taken care of.
- Ensure that the nutritional needs of children on ART are taken care of.
8

Food Security for Households Affected by HIV and AIDS

8.1 Food securities and its impact on households affected by HIV and AIDS

Household food security refers to all people in the home, including young children having access to adequate amounts and quality of food throughout the year. For this to happen, households must be able to produce, purchase or store food and have the adequate knowledge on how to use the food. There are three distinct but interrelated components of food security:

Three Components to Food Security

- **Availability**
  How much food is available in the home. Food can be supplied through farming, buying or food assistance.

- **Access**
  Members of households have the ability to obtain enough food for all members at all times. This can be through farming, having enough money to buy food or exchange of labour for food.

- **Utilisation**
  Proper biological use of food. This involves clean water, adequate sanitation, a diet that provides sufficient energy and essential nutrients. Knowledge in the household of proper nutrition, food preparation, childcare and illness management is a very important part of utilisation.

Households affected by HIV and AIDS often have difficulty maintaining food security in their homes and may be unable to follow the nutrition recommendations that are provided because they may lose the ability to access food. Illness and death due to HIV AND AIDS reduces household labour. Often the labour of healthy members of the household is transferred to caring for sick in the household. Any money that is available in the household is used for healthcare and funeral costs. This may lead to poverty and increased vulnerability to risky behaviour like sex for food and money, child labour, crime and drug abuse. HIV and AIDS therefore affect all three components of food security: availability, accessibility and utilization.

8.1.1 Support to obtain adequate food security and nutrition for PLWHA and families affected by HIV and AIDS

Health care personnel, and others who provide care and support guidance should recognize and identify the specific food security problem that may keep a household from accessing the care and support they need. In order to do this effectively they should:

- Improve their knowledge of the household's dietary practices and the underlying factors that might prevent PLWHA from improving their food security.
In order to support PLWHA they should have knowledge of the community where they work in the following areas:

- How people produce or obtain their food in the community and in households with PLWHA. This includes the types, quantities and seasonal variation of food availability.
- If people are able to access health, social and financial services.
- Food consumption patterns in the community. This includes the number and timing of meals, distribution of food among household members, and socio-cultural factors.

8.2 How the food security and vulnerability in households affected by HIV and AIDS can be determined

The food security in households affected by HIV and AIDS can be assessed by asking questions that will help determine what the availability, accessibility, and utilization of food in the household is.

Table 9 can be used to help make an assessment of the food security in households affected by HIV and AIDS.

**TABLE 9: Components of food security to assess**

<table>
<thead>
<tr>
<th>Component of Food Security to Assess</th>
<th>Questions to ask PLWHA</th>
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<tbody>
<tr>
<td>Availability:</td>
<td>Is the household able to produce and/or purchase food?</td>
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<td>Does anyone in the household receive food donations?</td>
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<td>Is there a diversity of food in the household?</td>
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<td>Are there any other ways in which members of the household obtain food?</td>
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<td>Accessibility:</td>
<td>Does every member of the household get enough food?</td>
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<td>Does every member of the household get a good variety of food?</td>
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<td>Are there members of the household who do not get adequate amounts of food?</td>
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<td>What are the reasons for not getting adequate amounts of food?</td>
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<td>Utilisation:</td>
<td>Is the household adequately able to prepare, process, preserve store the food?</td>
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</table>

8.3 What should be done once the assessment of food security in households affected by HIV is completed

Once there is a better understanding of the household’s food security situation, PLWHA and their household members can be linked and referred to programmes for food aid, safety nets and other services in the community.
To be able to do this effectively health care personnel should be aware of the services that different governmental departments offer to household affected by HIV and AIDS. Table 10 provides an overview of the current existing government programmes and their contact details.

It is important that health care personnel are not only aware of these different programmes in their geographic area, but that they work with the programme managers operating these services to agree on criteria for participation so as to ensure that eligible beneficiaries are referred.

8.4 People to target in the context of HIV

The following is a list of those people who should be targeted for services for participation in the different programmes offered to households affected by HIV, by different Government Departments.

8.4.1 Physiological criteria

- HIV+ (status is known).
- Chronically ill.
- Malnourished adult/child.

8.4.2 Medical criteria

- Patients on antiretroviral therapy.
- TB patients.

8.4.3 Demographic criteria

- Elderly headed household.
- Child headed household.
- Female/widow headed household, household with recent death of productive adult.
- Household with high dependency ratio.
- Orphans and Vulnerable Children (OVC).
- Street Children.
- Orphans left under the care of old grandparents.
- Relatives or foster families.
- Orphans and vulnerable children living in households where the caregiver(s) are bedridden with HIV and AIDS.
<table>
<thead>
<tr>
<th>Department Offering Programme</th>
<th>Name of Programme</th>
<th>Purpose of Programme</th>
<th>Nature of Relief</th>
<th>Eligible Criteria</th>
<th>Exit Criteria</th>
<th>Contact Information and Level of Control</th>
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<td>Nutritional supplements BMS, Food Parcels, Clinic gardens, Communal gardens and School gardens.</td>
<td>Malnourished individuals.</td>
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9  
Food Safety and Hygiene

9.1 Food and HIV infection

- Sharing eating utensils like cups, plates, knives and forks with HIV positive people cannot spread the virus.
- It is safe to share meals with people who are HIV positive. In the later stages of the disease people living with HIV and AIDS often require assistance with food preparation. This poses no threat of HIV infection to those caring for the infected person. When helping to feed someone with HIV and AIDS, touching them poses no risk.
- Everyone should follow these food safety guidelines, whether they are HIV positive or not. They are meant to increase awareness and not to create fear.

9.2 Germs and food poisoning

- Even healthy people sometimes experience diarrhoea, nausea, upset stomach, cramps and vomiting, not knowing what caused it. It is therefore difficult to tell if food is spoiled simply by its appearance, taste or smell. Food poisoning can range from mild to severe episodes and in some cases it can even cause death.
- A healthy body is equipped to handle many germs, but when the immune system is weakened the body becomes less able to fight off germs. People with HIV and AIDS are thus more vulnerable to germs and they have to be very careful with food. Any illness, including those caused by food, could further weaken the immune system.

9.2.1 Germs commonly found in food

Raw and undercooked chicken, meat, fish and eggs, unpasteurised milk and water that do not come from a tap are the main dangers. The three most common causes of food poisoning in people with HIV and AIDS are:

**Campylobacter**
This causes symptoms that include abdominal pain, diarrhoea (stools sometimes contain blood), nausea, headache, muscle pain and fever. It usually starts 2 to 5 days after eating the food and can last for 7 to 10 days.

**Listeria**
This causes flu-like symptoms such as chills, fever and headache and sometimes also nausea and vomiting. The symptoms can start 2 to 30 days after eating the contaminated food. In serious cases it can spread to the bloodstream and cause inflammation of the brain (encephalitis).

**Salmonella**
This causes flu-like symptoms, sometimes together with nausea, vomiting, abdominal pain and diarrhoea. The symptoms develop 6 to 48 hours after eating the contaminated food and can last for up to a week.
9.3 Personal hygiene around food

- Always wash your hands thoroughly with soap and water (with preferably warm water) before touching your food. Do this every time between touching raw and cooked food.
- It is very important to wash your hands after touching raw and cooked food, after visiting the toilet, after sneezing or blowing your nose.
- Cover all wounds to prevent contamination of food during preparation and handling. If you have cuts or sores on your hands, they must be covered when working with food. The use of elastic plasters may keep the wound clean, but can become dirty and contaminate the food. Rubber gloves will keep the wound clean and protect the food.

9.4 Clean and safe water

- In South Africa it is generally safe to drink water from a tap. If you get your water from a river or well, drink the water only after boiling it.
- Use the bleach method to make the water safe when it is not possible to boil the water. Add 1 teaspoon (5 ml or one capful if the bottle has a screw cap) of bleach to 25 litres of water. Mix it well and let it stand for 2 hours (or preferably overnight) before using it.
- Store clean and safe water in a clean container with a lid or covered with a cloth.
- Cool drinks and ice cubes should also be made with water that is clean and safe.

9.5 Safe food shopping

- It is safer to buy your foods in amounts that can be eaten before they spoil. It is sometimes cheaper to buy food in bulk, but without a fridge for safe storage this is not useful. For example, any milk not used within two days should be frozen.
- Do not use canned food if the can bulges or if it is dented or leaking. Do not be tempted by discounts on damaged cans.
- When buying cold meats and cheese, pre-packed and sealed products are safer. Cold meats that have been in the display case for some time are not safe.
- Do not buy cracked eggs. It is wise to inspect the eggs in the shop before they are bought.
- Many foods now have “Sell by”, “Best before” and “Use by” dates. Read the labels. It is not safe to buy foods after their “Sell by” date. Do not be tempted to do so even if the price is marked down. Check the food in your kitchen and throw away any food that has reached the “Best before” or “Use by” date, even if it still looks good. Do not taste food that you think might be spoiled. You might not have done these things in the past and never got sick. Remember that things are different with HIV and AIDS.

9.6 Keep a safe kitchen

- Wash all work surfaces (table tops, counters, sinks, shelves, etc.) with soap and water. Do not give germs a chance to grow.
- Clean up immediately after spills.
• Wash your kitchen floors at least once a week. If your kitchen is used often, the floors will need to be washed more often. Use separate cloths for the floor.
• Keep rubbish in a covered bin. Empty and wash the bin regularly.
• Disinfect cloths, sponges and scourers with bleach. Sunlight is an effective way to kill germs naturally. It is a good idea to dry your cloths in the sun.
• Use kitchen cloths in the kitchen only. Use separate cloths and cleaning materials for your bathroom.
• Keep your kitchen well ventilated. This helps to prevent the growth of mould and fungus.

9.6.1 Safe dishes and kitchen utensils

• Preferably wash your dishes in hot soapy water. Remember that it is the heat of the water, and not the soap, which is more important for hygiene. If the water gets too dirty, replace it and continue your washing. If you have enough water it is also a good idea to rinse the dishes with clean water after washing. Germs left on the plate may make you sick the next time you use your plate.
• Cracks in cups and dishes and scratches in plastic containers are ideal hiding places for germs, and it is difficult to clean properly. Replace cracked crockery and old plastic containers for your own safety.
• Use a cutting board for raw foods. The kitchen sink is not a safe place for this. If possible, use one cutting board for meat, chicken and fish and another one for vegetables and bread.
• If this is not possible, clean the board well with soap and hot water after cutting each type of food. Cutting boards made of plastic or marble, and not wood, are the safest for raw meat products. Replace your plastic cutting board when it becomes badly scratched and difficult to clean.

9.6.2 Safe foods

• If you are not sure where food comes from or how it has been prepared, it is safer not to eat it. If you have any doubt, do not eat it.
• Make sure the food is kept away from pets and other animals.
• Always keep food well covered to prevent flies and other insects from reaching it.

Fruits and vegetables

• Wash all fresh fruits and vegetables. If it is not possible to wash them properly, peel your fruits and vegetables. A mixture of 1 teaspoon of bleach added to one litre of clean water can be used to wash fruits and vegetables.
• Throw away any fruits or vegetables that are mouldy or rotten.

Milk and dairy products

• Use only pasteurized milk. Pasteurization is a process whereby milk is heated to a very high temperature, which destroys harmful germs. Look for the word “PASTEURISED” on the label. It might not be safe to drink home-produced milk. Home-produced milk should be boiled before use.
• Throw away mouldy cheese. Cutting off the mouldy part of the cheese is not good enough. Avoid blue-veined cheese and soft cheese, which contain live moulds. This is not considered safe for people with HIV and AIDS.
Meat
- Do not eat raw meat, poultry and fish, not even in small amounts.
- Cook meat thoroughly until it is cooked right through. If it is still pink inside, it is not safe for you. When eating in a restaurant, order your meat well done.

Eggs
- Do not eat raw eggs. Always cook eggs until the white is cooked and the yolk (the yellow section) is firm.
- It is not safe to add raw eggs to milk shakes.
- Do not use cracked eggs. The cracks allow germs to enter.
- Wash the eggs before breaking them.

9.6.3 Keep cold foods cold and hot foods hot
- Keep frozen foods frozen.
- Hurry home with frozen food. Food warms up and defrosts in warm vehicles. This allows germs to grow before you get home to re-freeze the food.
- Plan your shopping and pick up frozen foods last. If you know you are going to be long, pack the frozen food in a cooler bag.
- Foods frozen at home can be kept safely for 30 days only in the freezer compartment of a fridge. Germs can grow even in the freezer.
- Once frozen food has been defrosted, it should be used as soon as possible. It is not safe to freeze the defrosted food again.
- It is not safe to defrost frozen meat at room temperature. Room temperature gives germs the chance to grow and they may make you sick. Defrost frozen meat or other frozen foods in a fridge if you have one. Microwave ovens are also good for defrosting frozen food quickly.
- If you do not have a fridge, keep the food in a cool place away from the sun while it is defrosting.
- Once food has been cooked it should be eaten as soon as possible. It is not safe to store foods that have cooled down at room temperature.
- Any leftovers should be stored in a fridge if possible. Warm foods should be allowed to cool down before putting it in a fridge. Food should not be left out for any longer than 2 hours. Use airtight containers or cling wrap to protect foods in storage. If you do not have a fridge, keep the food covered and in a cool place.
- Do not keep food at room temperature for more than two hours. Be careful about eating cold cooked food that has been kept at room temperature for longer than this. This often happens at parties and large functions such as weddings. Many healthy people have suffered stomach upsets after such events. When you are infected with HIV you need to be extra careful.
- When you eat leftovers of cooked food, you should reheat them to a high temperature to make sure that you kill all germs first. It is not safe to simply warm the food up.
9.7 Take extra care when travelling

Food safety standards are not the same everywhere. When people travel they come into contact with new germs that their bodies are not used to. Our immune systems are not prepared for this and it can be a problem even for healthy people. Diarrhoea is a common consequence. When HIV and AIDS weaken the immune system, it is easier to get sick from food and water that does not cause problems in uninfected people. Extra precautions should be taken when travelling. It is advisable to drink water only after boiling. Alternatively only bottled and canned drinks or water should be drunk. Do not use ice in drinks, the water used for this could be unsafe. Street foods, which are not properly heated and cooked, could also be a source of food poisoning.
10 Nutrition Component of the Home- and Community-based Care

10.1 Nutrition components of home-based care

It is family members that provide care, support and general well being of their household members afflicted with HIV and AIDS. It is often the young productive member of most families that turn to their aging parents for support, as they are the most infected with HIV and AIDS. Their care is a hardship experience for the old parents who must also care for the grandchildren. Therefore home-based caregivers play a crucial role in supporting the family by ensuring that the infected person is washed and fed an adequate diet and is on schedule with medications.

The care and support of for PLWHA is not an easy task. Yet the dignity and self-respect of the infected person should be maintained and as such independence as possible should be respected in order to boost self-esteem. Nutritional care and support of the PLWHA at home is important and involves:

- Supporting the family or caregiver to ensure the infected person has adequate intake of adequate diet.
- Provide nutrient dense and culturally acceptable meals and snacks that are enticing and interesting to prevent weight loss or to replenish lost nutrients.
- Practice food safety and hygiene to avoid food-borne illnesses.
- To manage HIV symptoms related to nutrition so as to maintain an optimum status of the infected person.

10.2 Nutrition during palliative care in the home

Palliative care may also be provided in the home if hospice facilities are unavailable. This is to maintain the dignity and self-respect of PLWHA. With palliative care, nutrition interventions become less paramount and the focus is on addressing the physical, psychological and spiritual needs of the patient. The main goal is to help relieve pain and other symptoms and allow the infected person to live in comfort and with dignity during the final stages of life.

10.3 The hints to caregivers providing home-based care

**Instruct all patients in oral care**
- Use soft toothbrush to gently brush teeth, tongue, palate and gums to remove debris.
- Use diluted sodium bicarbonate (baking soda) or toothpaste.
- Rinse mouth with diluted salt water after eating and at bedtime (usually 3-4 times daily).

**Manage key symptoms**
- Treat weight loss.
- Encourage the sick person to eat, but do not use force as the body may not be able to accept it and he or she may vomit.
- Offer smaller meals frequently of what the sick person likes.
- Let the sick person choose the foods he or she wants to eat from what is available.
- Accept that intake will reduce as patient gets sicker and during end-of-life care.
- Seek help from a health care personnel if you notice rapid weight loss or if the sick person consistently refuses to eat any food or is not able to swallow.
- Involve the patient in planning their own meals.
- Weigh the patient regularly and keeping the record. Looking out for any undesirable weight loss or oedema and taking action promptly.
- Encourage good personal hygiene and food safety practices for handling, preparing, cooking and serving food in the whole household.
- Encourage light exercise like walking in the neighbourhood and carrying out simple chores if possible.
References


### Annexure 1:
The Role of some vitamins and minerals in the body and their sources

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Its Role</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamins A</td>
<td>Required for maintenance of epithelial cells, mucous membranes, and skin. Needed for immune system function and resistance to infections. Ensure good vision. Needed for bone growth.</td>
<td>Full-cream milk (when fortified), cheese, butter, fish oil, eggs, liver, carrots, mangoes, paw-paw, pumpkin, green leafy vegetables, yellow sweet potatoes.</td>
</tr>
<tr>
<td>Vitamin B1/ Thiamine</td>
<td>Used in energy metabolism, supports appetite, and central nervous system functions.</td>
<td>Whole-grain cereals, meat, poultry, fish, liver, milk, eggs, oil, seeds, and legumes.</td>
</tr>
<tr>
<td>Vitamin B2/ Riboflavin</td>
<td>Used in energy metabolism, supports normal vision, health and integrity of skin.</td>
<td>Milk, eggs, liver, meat, fish, yoghurt, green leaves, whole-grained cereals, and legumes.</td>
</tr>
<tr>
<td>Vitamin B3/ Niacin</td>
<td>Essential for energy metabolism supports health and integrity of skin, nervous and digestive system.</td>
<td>Milk, eggs, meat, poultry, fish, peanuts, whole-grained cereals, unpolished rice.</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>Facilitates metabolism and absorption of fats and protein, converts tryptophan to niacin, helps to make red blood cells. Some TB drugs cause B6 deficiency.</td>
<td>Legumes (white beans), potatoes, meats, fish, poultry, shellfish, watermelon, oil seeds, maize, avocado, broccoli, green leafy vegetable. Alcohol destroys vitamin B6.</td>
</tr>
<tr>
<td>Folate (folic acid)</td>
<td>Required for synthesis of new cells, especially red blood cells and gastrointestinal cells.</td>
<td>Liver, green leafy vegetables, fish, legumes, groundnuts, oil seeds.</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>Required for synthesis of new cells, helps to maintain nerve cells. Works together with folate.</td>
<td>Meat, fish, poultry, shellfish, cheese, eggs, milk.</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Helps the body to use calcium and other nutrients to build bones and blood vessels well. Increase non-heme iron absorption. Increase resistance to infections and acts as an antioxidant. Important for protein metabolism.</td>
<td>Citrus fruits such as guavas, oranges and lemons, cabbage, green leaves, tomatoes, peppers, potatoes, and fresh milk. Vitamin C is lost when food is cut up, heated, or left standing after cooking.</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Required for mineralisation of bones and teeth.</td>
<td>Produces by skin on exposure to sunshine, milk, butter, cheese, fatty fish, and eggs, liver.</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>Acts as an antioxidant. Protects cell membranes and metabolism, especially red and white blood cells. Protects vitamin A and other fats from oxidation. Facilitates resistance against diseases, particularly in lungs.</td>
<td>Green and leafy vegetables, vegetable oils, wheat germ, whole-grain products, butter, liver, egg yolk, peanuts, milk fat, nuts, seeds.</td>
</tr>
<tr>
<td>Nutrient</td>
<td>Its Role</td>
<td>Sources</td>
</tr>
<tr>
<td>----------</td>
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</tr>
<tr>
<td>Iron</td>
<td>Required to make haemoglobin for red blood cells, and to transport oxygen from lungs to cells throughout the body. Acts as an anti-oxidant. Required for utilization of energy and metabolism, by cells.</td>
<td>Heme iron sources <em>(high absorption)</em> include red meat, liver, fish, poultry, and shellfish. Non-heme iron sources <em>(low absorption)</em> include eggs, legumes, peanuts, some cereals and dried fruits. Vitamin C, heme iron foods, and some fermented foods increase non-heme iron absorption. Tea, coffee, and some grains and green leafy vegetable <em>(with phytate)</em> decrease non-heme iron absorption.</td>
</tr>
<tr>
<td>Calcium</td>
<td>Required for building strong bones and teeth. Important for normal heart and muscle functions, blood clotting and pressure, and immune defences.</td>
<td>Milk, yogurt, cheese, green leafy vegetables, broccoli, dried fish with bones that are eaten, legumes, peas.</td>
</tr>
<tr>
<td>Selenium</td>
<td>Acts as an antioxidant together with vitamin E. Prevents the impairment of heart muscles.</td>
<td>Meat, eggs, seafood, whole grains, plants grown in selenium rich soil.</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Important for building strong bones and teeth, protein synthesis, muscle contraction, transmission of nerve impulses.</td>
<td>Nuts, legumes, whole grain cereals, dark green vegetables, seafood.</td>
</tr>
<tr>
<td>Iodine</td>
<td>Ensure the development and the proper functioning of the brain and the nervous system. Important for growth, development and metabolism.</td>
<td>Seafood, iodised salt, plant grown in iodine-rich soil.</td>
</tr>
</tbody>
</table>
Annexure 2:
Recommended Dietary Allowance for a non-HIV infected adults

<table>
<thead>
<tr>
<th></th>
<th>Vit A</th>
<th>Vit C</th>
<th>Vit E</th>
<th>Vit B6</th>
<th>Vit B12</th>
<th>Folate</th>
<th>Zinc</th>
<th>Iron A</th>
<th>Selenium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ug/d</td>
<td>mg/d</td>
<td>mg/d</td>
<td>mg/d</td>
<td>Ug/d</td>
<td>mg/d</td>
<td>mg/d</td>
<td>mg/d</td>
<td>Ug/d</td>
</tr>
<tr>
<td>RDA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>900</td>
<td>90</td>
<td>15</td>
<td>1.3</td>
<td>2.4</td>
<td>400</td>
<td>11</td>
<td>8</td>
<td>55</td>
</tr>
<tr>
<td>Women</td>
<td>700</td>
<td>75</td>
<td>15</td>
<td>1.3</td>
<td>2.4</td>
<td>400</td>
<td>11</td>
<td>18</td>
<td>55</td>
</tr>
<tr>
<td>UL</td>
<td>3 000</td>
<td>2 000</td>
<td>1 000</td>
<td>100</td>
<td>-</td>
<td>1 000</td>
<td>40</td>
<td>45</td>
<td>400</td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>3 000</td>
<td>2 000</td>
<td>1 000</td>
<td>100</td>
<td>-</td>
<td>1 000</td>
<td>40</td>
<td>45</td>
<td>4</td>
</tr>
</tbody>
</table>

UL = maximum level of daily nutrient intake that is likely to pose no risk of adverse affects. It represents total intake from food, water and supplements. There is no established UL for Vitamin B12; extra caution is warranted in consuming levels above the recommended intakes (RDA).

# Annexure 3:
## Quick Nutrition Screening Tool

For each statement below, circle the YES for those that apply to you and the NO for those that do not.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Without wanting to, I have lost 10 kg or more in the last 6 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I have problems eating because of my current health status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I eat less than 3 times a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I eat meat or other proteins like beef, poultry, peanut butter, dried beans, etc. less than 3 times a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I eat bread, cereals, rice, pap, etc. less than 4 times a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I eat fruits or vegetables or drink juice less than 3 times a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I drink/eat milk products like milk, cheese, yoghurt etc. less than 2 times a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I have 3 or more drinks of beer, liquor or wine almost every day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I don’t always have enough money to buy the food I need</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I do not have any place to cook or to keep my foods cold</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I do not take any vitamin and mineral supplements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I often have one or more of the following: (circle all that apply)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- diarrhea, nausea, heartburn, bloating, vomiting, not/poor appetite, feels too tired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I take one or more of the following medications: (circle all that apply)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- d4T, 3TC, Efavirenz, NVP, AZT, Didanosine, lopinavir, ritonavir, lopinavir, INH, antibiotics</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>14. I smoke cigarettes, cigars, or chew tobacco every day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. I often don’t feel like eating, food shopping, or cooking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I have problems when I eat or drink milk products (cramping)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I have problems with my stomach when I eat high fat foods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I have tooth, swelling, or mouth problems (like thrush) that makes it hard for me to eat</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>19. I have to watch what I eat because of a health problem like: (circle all that apply)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- diabetes, high blood pressure, kidney or liver problems, cancer or high lipids</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>20. For women: I am pregnant or breast feeding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Additional Questions:

21. At least one of the following is true:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think the shape of my body is changing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My arms and legs are getting thinner and I can see my veins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My belly is getting bigger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My neck has a hump</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Without wanting to, I have gained extra weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Sometimes I feel too weak to do the things I want (cook, shop, clean-up, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. My mood is low more often these days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. I don’t feel able to change my diet to make it better</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total number of YES answers:**

You now have a Nutrition Score. **Share it with the patient.** If there are any "YES" answers, the patient may need more nutritional help. The more "YES" answers, the more concern there may be. Talk this over with the patient and refer to a dietician or other health care personnel.
# Annexure 4:
## Common problems of HIV and AIDS and their dietary management

<table>
<thead>
<tr>
<th>Food Related Problems</th>
<th>Food Related Signs and Symptoms</th>
<th>Possible Causes</th>
<th>Dietary Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diarrhoea</strong> NB: diarrhoea can cause dehydration and weight loss.</td>
<td>Diarrhoea. Loose watery stools, more frequent than usual.</td>
<td>Bacteria or viral and fungal infections, Food poisoning, Drugs or medications (esp. antibiotics), Poor absorption of and intolerance to nutrient e.g. lactose and sugar.</td>
<td>Drink fluids such as water, diluted and unsweetened fresh fruit juices. Drink salt and sugar solution. Eat salty foods e.g. soup, or add extra salt to meals. Once diarrhoea stops, follow normal intakes. Eat small frequent meals. Eat fermented foods like mahewu, sour porridge. Decrease fatty foods. If milk and dairy products cause cramps, use fermented products like mass and yoghurt. Include soluble fibre (pectin) by eating foods like bananas, peeled apples and pears, oats, carrots, pumpkin, paw-paw, potatoes. Avoid insoluble fibre like in whole grain foods and beans.</td>
</tr>
<tr>
<td><strong>Fat Intolerance</strong></td>
<td>Fat intolerance. Diarrhoea or Steatorrhoea (fat in the stool).</td>
<td>Malabsorption of fat, Incomplete digestion of fat, Malnutrition.</td>
<td>Eat soft, mashed, liquid foods like soup, porridge. Eat fruits and vegetables and other low fat foods. Bake, boil, steam or roast food. Squeeze lemon juice on meat in fish to improve digestion, eat lean meat. Remove skin from chicken and fat before cooking. Avoid oil, butter, margarine and foods that contain or were prepared with it. Avoid fatty foods such as potato chips, butter/margarine, mayonnaise and cream.</td>
</tr>
<tr>
<td><strong>Nausea and Vomiting</strong> NB: nausea and vomiting will cause dehydration and weight loss.</td>
<td>Nausea and vomiting, Loss of appetite. Vomiting.</td>
<td>Drugs and medications (side effects), Infections, Dirty environment, Food with strong aromas, Food intolerance.</td>
<td>Take small frequent meals. Eat slowly and chew well. Cool or cold meals are better tolerated than hot. Take diluted and unsweetened fruit juice, especially lemon. Sour or salty foods e.g. lemon, salty soups are better tolerated than sweet foods. Do not lie down immediately after eating. Avoid greasy, high fat or spicy foods. Avoid taking fluids with meals. Avoid the smell of cooking and foods with strong aromas such as cabbage, garlic, and onion.</td>
</tr>
<tr>
<td><strong>Food Related Problems</strong></td>
<td><strong>Possible Causes</strong></td>
<td><strong>Dietary Management</strong></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Candida/thrush/mouth sores/chewing difficulties</td>
<td>Infection. Weakened immune system. Antibiotic therapy.</td>
<td>Try soft non-irritating foods e.g. scrambled eggs, custard, pureed pumpkin, paw-paws, or porridge. Fermented food like laheu, motoho, maas, yoghurt relieves oral thrush. Such a lump of ice or have an ice cold drink before a meal. Practice good oral hygiene. Appropriately add custard to reduce acidity. Use a straw to avoid contact with the affected part. Use garlic in food or prepare garlic tea. Avoid sticky or dry foods such as peanut butter on white bread, popcorn, roasted nuts, dry toast. Avoid sweet or sugary drinks. Avoid hot foods; cold food can be soothing. Avoid acidic food e.g. citrus fruit, vinegar and spicy food.</td>
<td></td>
</tr>
<tr>
<td>Loss of appetite and Anorexia</td>
<td>Chronic infection. Drugs or medication. Malnutrition. Monotonous meals. Stress, anxiety and depression. Noxious smell and odours.</td>
<td>Eat with friends or family. Eat small frequent meals and nutritious snacks throughout the day in between meals. Take high energy, high protein liquids and fruit juices. Try to make meals attractive and appetizing. Eat food with pleasant aroma. Avoid drinking liquids before and during a meal. Brush your teeth after a meal. Avoid fatty foods and sweets. Avoid smoking. Avoid preparing meals or staying in the kitchen.</td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td>Pain or illness. Stress. Depression.</td>
<td>Have someone else to prepare food for the sick individual to avoid fatigue. Eat food that is easy to prepare and easy to chew. Eat fresh fruits that do not require preparation e.g. banana, paw-paw etc. Eat nutritious snacks throughout the day. Drink high protein, high energy liquids e.g. laheu, phalari, etc. Rest as much as possible. NB: Seek counselling and psycho-social support.</td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>Infection.</td>
<td>Eat high energy, high protein meals with plenty of fluids and fruit juice. Drink nutritious liquids often e.g. milk, sour milk, laheu, motoho, maas.</td>
<td></td>
</tr>
<tr>
<td>Food Related Problems</td>
<td>Food Related Signs and Symptoms</td>
<td>Possible Causes</td>
<td>Dietary Management</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------------------</td>
<td>-----------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Heartburn/ Bloatedness or fullness</td>
<td>Feeling of fullness, discomfort or pain, after eating</td>
<td>Indigestion, Antibiotics, Some anti-inflammatory drugs, Some gas forming or cold foods, Constipation, Too spicy foods, Too much fatty foods</td>
<td>Eat small frequent meals, Eat slowly and chew foods well, Drink fluids an hour before or after a meal, Eat long before you plan to go to sleep, Eat high fibre foods, Exercise, Avoid gas-forming foods such as beans, carbonated drinks, and onion, Avoid greasy, fried, spicy foods.</td>
</tr>
<tr>
<td>Cold, flu and Coughs</td>
<td>Sneezing, coughing, running or blocked nose, sore throat</td>
<td>Infection, Allergies, Tuberculosis</td>
<td>Take high protein, high-energy fluids e.g. mahew, philani, etc., Eat fruit and drink fruit juices, Cut an onion into small pieces and keep it by the bedside. The onions stimulate secretions and will keep the airway moist thus soothing them, Sprinkle sugar onto an onion that has been cut into pieces and let it soak in to make syrup. Drink it slowly. This helps to soothe the throat, Drink ginger and cinnamon tea or make hot ginger compresses for the chest, Avoid very cold foods and drinks.</td>
</tr>
<tr>
<td>Anaemia</td>
<td>Feeling tired and weak, Paleness in the eyes, tongue, palms and nail beds, Cough lasting for more two weeks, Feeling feverish and sweating at night, Spitting blood, Irregular passage of stock, Passing of very hard and small stool</td>
<td>Lack of iron in diet, Infections such as malaria and hookworms, Blood loss due to an injury or monthly periods/menses</td>
<td>Eat more iron-rich foods, such as animal products (eggs, fish, meat and liver), green leafy vegetables (beetroot and sweet pumpkin leaves and spinach), fruits and vegetables, legumes (beans, lentils, groundnuts), nuts, oil seeds and fortified cereals e.g. South Africa's fortified mealie meal and flour, Take iron supplements. Best if taken with Vitamin C such as tomatoes, oranges or orange juice or any other fruits to help absorb iron, Take de worming tablets every six months and treat malaria and/or take anti-malaria drugs.</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td></td>
<td></td>
<td>Seek medical attention immediately, Consume foods high in protein, energy, iron and Vitamins, Consult medical personnel about taking food with medications, if taking isoniazid for treatment, take Vitamin B6 supplement to avoid deficiency of this micronutrient.</td>
</tr>
<tr>
<td>Constipation</td>
<td>Eating highly processed/refined foods, Inadequate intake of foods high in fibre, Some medications</td>
<td></td>
<td>Eat more foods that are high in fibre content such as fresh Maize, Roller meal, whole meal bread, green vegetables and fruits, Avoid processed or refined foods, Avoid using cleansing practices such as enemas and medications, Drink plenty of fluids including boiled water.</td>
</tr>
</tbody>
</table>

Adapted from: WHO/FAO Guidelines on Nutrition Care and Support for PLHWA.
## Annexure 5:
### Examples of servings

<table>
<thead>
<tr>
<th>Food Items</th>
<th>Servings</th>
</tr>
</thead>
</table>
| **Starch**               | Cereals, grains, pasta, breads, crackers, snacks, starchy vegetables, and cooked dried beans, peas, and lentils are starches. In general one starch is:  
                           * ½ cup (half cup) of cereal, grain, pasta, or starchy vegetable,  
                           * 30g of a bread product, such as 1 slice of bread,  
                           * 30g of most snack foods. |
| **Starchy Vegetables**   | Sweet potato, green peas, Potato (mashed, boiled), baked Beans, lentils and peas, uncooked, Bean salad, no oil - ½ cup (half cup).                                                                      |
| **Vegetables**           | All vegetables contain small amounts of carbohydrates and kilojoules, and therefore no distinction is made between vegetable A and vegetable B. Vegetables contain important nutrients. Try to eat at least 2 or 3 vegetable choices each day. In general, one vegetable serving is:  
                           * ½ cup of cooked vegetables or vegetable juice,  
                           * 1 cup of raw vegetables. |
| **Fruits**               | Fresh, frozen, canned, and dried fruits and fruit juices are on this list. In general one fruit exchange is:  
                           * 1 small to medium fresh fruit,  
                           * ½ cup of fruit juice,  
                           * ±½ cup of canned fruit. |
| **Milk**                 | Whole milk  
                           * 1 cup, powder milk - 7 tablespoons |
| **Meat and meat substitutes** | Meat and meat substitutes that contain both protein and fat are on this list. In general, one meat exchange is:  
                           * 30g of meat, fish, poultry or cheese,  
                           * ½ cup of dried beans.  
                           Based on the amounts of fat they contain, meats are divided into very lean, lean, medium-fat, and high-fat lists. This is done so that you can see which ones contain the least fat. |
| **Fats**                 | In general, one fat exchange is:  
                           * 1 level teaspoon of regular margarine or vegetable oil,  
                           * 1 tablespoon of regular salad dressing.  
                           * When used in smaller amounts (smaller than 1 meat exchange), bacon and peanut butter are counted as fat choices. When used in larger amounts (larger than 1 fat exchange), they are counted as high-fat meat choices. |
### Annexure 6: Sample menu

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>Lunch</th>
<th>Supper</th>
</tr>
</thead>
</table>
| 1 cup mealie meal porridge  
OR  
2 weetbix  
1 teaspoon margarine  
1 teaspoon sugar  
1 cup milk | 1 cup putu  
1 cup maas  
1 small banana | 1 cup rice/ stiff pap  
1 ladle chicken liver  
½ cup carrots  
½ cup spinach |

<table>
<thead>
<tr>
<th>Nutritious snack</th>
<th>Nutritious snack</th>
<th>Summary</th>
</tr>
</thead>
</table>
| 2 brown bread  
2 level teaspoons margarine  
2 eggs boiled  
½ cup fruit juice | 2 brown bread  
2 level teaspoons margarine  
2 tablespoon peanut butter  
OR  
40g cheese  
1 small apple | 11 servings starchy foods  
5 servings vegetables & Fruit  
5 servings margarine/oils/fats  
6 servings meats & milk |