

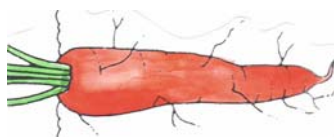
THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF HEALTH

NATIONAL GUIDE
ON NUTRITION CARE AND SUPPORT FOR
PEOPLE LIVING WITH HIV/AIDS



Tanzania Food and Nutrition Centre

December 2003



National Guide on
Nutrition Care and Support for People Living with
HIV/AIDS

Developed by:
Tanzania Food and Nutrition Centre
22 Ocean Road
P.O. Box 977
Dar es Salaam
Tanzania

Tel: (255) 022 2118137/9
Fax: (255) 022 2116713
Email: tfnc@muchs.ac.tz

National Guide on Nutrition Care and Support for People Living with HIV/AIDS

ISBN 9976-910-40-1

© Tanzania Food and Nutrition Centre, 2003
Extracts from this guide may be reproduced for non-profit purposes with
acknowledgement to Tanzania Food and Nutrition Centre.

The final review of this guide was supported by UNICEF while the National AIDS
Control Program provided financial support for printing.

CONTENTS

PAGE

Preface	iv
Acknowledgements.....	v
Abbreviations and acronyms	vi

Chapter One: Introduction

1.1	Situation analysis of HIV/AIDS	1
1.2	Nutrition situation in Tanzania	1
1.3	The relationship between nutrition and HIV/AIDS	2
1.4	Impact of HIV/AIDS on nutrition	3
1.4.1	Direct effects	3
1.4.2	Indirect effects	3
1.5	The need for the Guide	4
1.6	Target groups	4
1.7	The use of the Guide	4

Chapter Two: Nutrition Considerations for PLWHA

2.1	Food groups	5
2.2	The importance of selected nutrients in HIV/AIDS	5
2.3	Healthy lifestyle for PLWHA	10
2.4	Food safety and hygiene	12
2.5	Nutrition for PLWHA at different stages	12
2.5.1	The asymptomatic HIV infected person	12
2.5.2	Early symptoms including some weight loss	13
2.5.3	Advanced stage of HIV/AIDS	13
2.6	Nutrition for special groups	13
2.6.1	Children born to HIV positive mothers	13
2.6.2	Adolescents	15
2.6.3	Pregnant women	15
2.6.4	Lactating women	16
2.7	Nutritional supplements for PLWHA	16

Chapter Three: Dietary Management of HIV/AIDS Related Complications

3.1	Diarrhoea and fat malabsorption	18
3.2	Poor appetite and taste changes	19
3.3	Sore mouth, throat and thrush	20
3.4	Nausea and vomiting	20
3.5	Fever	21
3.6	Heartburn and peptic ulcers	21
3.7	Weight loss	21

3.8	Anaemia	22
3.9	Constipation	22
3.10	Tuberculosis	22
3.11	Cold, flu and cough	23
3.12	Skin conditions	23

Chapter Four: Nutritional Issues Associated with Modern and Traditional Therapies

4.1	Nutrition and modern therapies	24
4.2	Commonly used local remedies for different ailments	27

Chapter Five: Household Food Security and HIV/AIDS

5.1	Actions to improve food security for households with PLWHA	29
5.2	Monitoring of Household Food Security	31

Chapter Six: Other Nutrition support services for PLWHA

6.1	Nutrition education	32
6.2	Nutrition counselling	32
6.3	Fighting stigma and discrimination against PLWHA	33
6.4	Monitoring nutrition of PLWHA	34

7.0	References	37
------------	-------------------------	-----------

8.0 Annexure

Annex I: Recipes	40
Annex II: Reference table for Body Mass Index	44
Annex III: Glossary	45

Preface

To date the global HIV/AIDS epidemic is far worse than previously thought. In Tanzania the rate of infection is high with adult transmission rate of 9.6%. The UNAIDS and NACP estimates that there were 1.8 million adults and children living with HIV/AIDS by the end of the year 2003. In the same year 186,900 people died of AIDS.

Since its recognition, various clinical and social efforts have been undertaken to address the HIV/AIDS problem. The efforts have been directed towards behavioural change for the prevention of transmission, treatment of opportunistic infections and use of antiretroviral drugs to prolong the lives of the infected individuals.

Experiences from other countries have shown that good nutrition has a role to play in HIV/AIDS. It strengthens the body's immune system and thus decreasing the vulnerability to opportunistic infections. This, in turn, improves the quality of life of the individual and delays the process of HIV progression to AIDS. Maintaining good nutrition also helps to reinforce the effectiveness of medicines taken by the individual including anti-retroviral drugs.

It is, therefore, important to ensure that PLWHA get proper nutritional care to strengthen their immunity and complement the drug treatment; all aimed at improving their health, nutritional status and mitigating the effects of the HIV/AIDS condition.

This guide provides principles of nutritional management of HIV infected persons. It makes a useful reference material for the different groups and individuals providing nutrition care and support for PLWHA. The public, too, will find the book useful.

Anna M. Abdallah (MP)
Minister for Health

Acknowledgements

The development of this guide is a result of concerted efforts by many individuals and organisations at different stages.

The Ministry of Health wishes to specifically acknowledge the technical contributions of the following staff of the Tanzania Food and Nutrition Centre (TFNC), who as members of different drafting, editing and translating teams enabled the successful production of this guide: Dr Daniel Nyagawa, Tumaini Charles, Restituta Shirima, Faith Magambo, Hellen Semu, Dr Wilbard Lorri, Dr Godwin Ndossi, Dr Sabas Kimboka, Dr Lunna Kyungu, Hilda Missano, Luitfrid Nnally, Monica Ngonyani, Pantaleo Mboya, Dr Alfred Sanga, Bupe Ntoga, Elisante Urrio, Elizabeth Macha, Vumilia Lyatuu, Esther Elisaria, Margeth Rwenyagira and Dr Fatma Abdallah.

The Ministry further wishes to recognise and acknowledge the additional contribution of the following individuals: Hamida Ramadhani (UNICEF), Dr Theopista John (WHO), Joseph Katto (SHDEPHA⁺), Mary Materu (COUNSENUth), Bibiana Francis, (TAWG) and Dionis Ndamugoba (MoCDGC). Others include Nancy Msobi (NACP), Pendo Sumuni (PASADA), Jitto Ram (ADIC/TAS), Flora Msacky (UMATI/TAHEA), Dr John Msuya (SUA), Josephine Komba (AMREF) and Prudence Masako (TAHEA).

Lastly sincere gratitude goes to Zainabu Mrutu and Aysha Mgaya of TFNC who worked tirelessly to word-process the document.

Abbreviations and Acronyms

ADIC/TAS	-	Alcohol and Drug Information Centre/Tanzania Assistance Strategy
AIDS	-	Acquired Immunodeficiency Syndrome
AMREF	-	African Medical Research Foundation
ARV	-	Anti-retroviral Drugs
AZT	-	Azidothymidine
BMI	-	Body Mass Index
CBOs	-	Community Based Organizations
COUNSENUTH	-	Centre for Counselling, Nutrition and Health Care
FANTA	-	Food and Nutrition Technical Assistance
FAO	-	Food and Agricultural Organization
HB	-	Haemoglobin
HFS	-	Household Food Security
HIV	-	Human Immunodeficiency Virus
IEC	-	Information, Education and Communication
IU	-	International Units
MCH	-	Mother and Child Health
MoCDGC	-	Ministry of Community Development Gender and Children
MTCT	-	Mother to Child Transmission
NACP	-	National AIDS Control Programme
NGOs	-	Non-Governmental Organizations
ORS	-	Oral Rehydration Solution
PASADA	-	Pastoral Activities and Services for People with AIDS in Dar es Salaam
PLWHA	-	People Living With HIV/AIDS
SHDEPHA ⁺	-	Service, Health and Development for People Living With HIV/AIDS
STIs	-	Sexually Transmitted Infections
TAHEA	-	Tanzania Home Economics Association
TB	-	Tuberculosis
TFNC	-	Tanzania Food and Nutrition Centre
UMATI	-	Chama cha Uzazi na Malezi Bora Tanzania
UNAIDS	-	Joint United Nations Programme on HIV/AIDS
UNICEF	-	United Nations Children's Fund
USAID	-	United States Agency for International Development
WDC	-	Ward Development Committee
WHO	-	World Health Organization
ZDV	-	Zidovudine

CHAPTER ONE

1.0 INTRODUCTION

1.1 Situation analysis of HIV/AIDS

The HIV/AIDS epidemic remains the greatest threat to health and socio-economic development in the world. In the year 2003, it is estimated that, 2.5 - 3.5 million people died of AIDS and 4.2 - 5.8 million were infected with HIV. Globally, 34 - 46 million people were living with HIV.

In Africa, the sub-Saharan region is the worst affected having about 25.0 - 28.2 million people living with HIV/AIDS (PLWHA). By the end of 2003, AIDS claimed about 2.2 – 2.4 million lives of Africans and 3.0 - 3.4 million were infected with the virus (UNAIDS, 2003). Further estimation shows that 3 million children below 15 years and 10 million young people aged 15-24 years were living with HIV/AIDS (UNAIDS/WHO, 2002).

In Tanzania, the epidemic continues to have a devastating effect. A total of 12,675 AIDS cases were reported to the National AIDS Control Programme (NACP, 2003) from the 21 regions with a cumulative total of 785,865 cases in 2002 since the first AIDS case in 1983.

The main mode of HIV transmission is heterosexual constituting up to 82% of all infections during the year 2002. Mother-to-Child Transmission (MTCT) constituted 6% and blood transfusion 0.3%. Estimations by UNAIDS and NACP show that by the year 2003, about 1.8 million adults and children were infected with HIV/AIDS whereas 186,900 died of AIDS (UNAIDS/NACP, 2004).

1.2 Nutrition situation in Tanzania

Nutrition problems especially undernourishment remains a major problem in Tanzania. Data available by the year 1999 indicate that 30% of the total population suffered from Protein Energy Undernutrition, 62% of children below five years and 66% of pregnant women are anaemic. Furthermore, 25% of all Tanzanians were affected by Iodine Deficiency Disorders, whereas Vitamin A Deficiency affected 24 % of children aged between 6 months and 6 years (TRCHS, 1999; TFNC, 1997).

Other nutritional problems that exist include pellagra, scurvy, beriberi, rickets and deficiency of some minerals such as zinc. According to FAO Food Balance Sheet for Tanzania (2001) the average energy intake of an adult Tanzanian is 1997 calories, which is below the recommended average of 2300 calories per day. This shows that the energy requirements for most Tanzanians are not met. Since nutrient requirements are increased for PLWHA, it can be argued that these people are definitely more prone to malnutrition.

The causes of nutrition problems have been inadequate food intake, frequent infections and diseases, household food insecurity, inadequate care for

vulnerable groups and inadequate basic services. Others include poor economic situation, inequitable distribution and utilization of services and resources, poor eating patterns related to traditions, customs and practices and more recently HIV/AIDS.

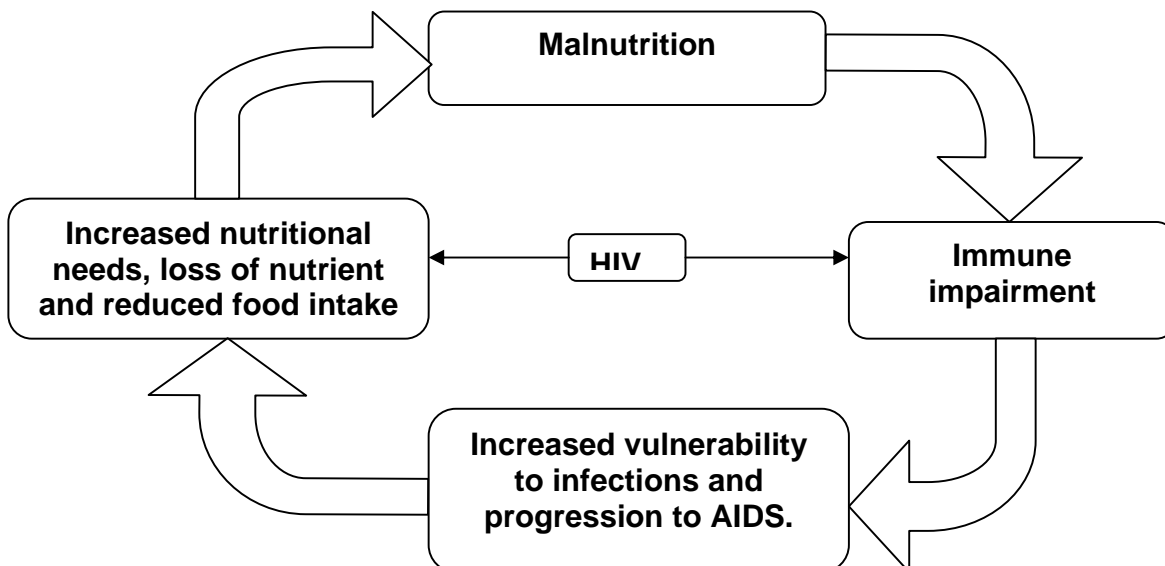
1.3 The relationship between nutrition and HIV/AIDS

Nutrition and HIV/AIDS are inextricably linked creating a vicious cycle (figure 1). HIV/AIDS affects nutrition and nutrition influences the progression of the HIV infection to AIDS. HIV/AIDS impairs the body immune system of infected persons increasing their vulnerability to infections, which in turn increases nutrient requirements that may lead to malnutrition.

Malnutrition on the other hand leads to immune impairment, which in turn speeds up the progression of HIV to AIDS. When a malnourished person acquires HIV, the progression to AIDS is fast as the immune system is already weak to fight against infection. On the contrary, a well-nourished individual has strong immune system, which delays the process of HIV progression to AIDS.

Malnutrition in HIV/AIDS infected person manifests itself in weight loss, muscle wasting, reduced immune system function, minerals and vitamins deficiencies and increased susceptibility to infection. Generally, good nutrition increases resistance to infections and diseases by stabilising the immune system, providing energy and building up the body.

Fig. 1. Relationship Between Malnutrition and HIV/AIDS



Adapted from: Semba and Tang (1999)

Unless the vicious cycle is broken, the immune function and the clinical status will continue deteriorating, contributing directly to repeated morbidity and eventually death of the infected individual. Timely improvement of nutrition can help strengthen the immune system, prevent weight loss and delay disease progression.

1.4 Impact of HIV/AIDS on nutrition

HIV/AIDS has direct and indirect effects on nutrition. The direct effects include reduced food intake, poor absorption of nutrients and changes in metabolism while the indirect effects are related to household food insecurity. All these effects result into weight loss, muscle wasting and weakened immune system.

1.4.1 Direct effects

- **Reduced food intake**

The HIV/AIDS infected person fails to take adequate food due to loss of appetite and difficulty eating as a result of mouth and throat sores or fever and side effects from medication including nausea and vomiting. Other reasons include fatigue, mental and psychological depression, infection and illnesses, social stigma and economic factors such as inability to produce and get good quality foods. This results in rapid weight loss.

- **Poor absorption of nutrient**

HIV/AIDS causes frequent bouts of diarrhoea, increased intestinal permeability and deterioration of the lining of the gut. These all together lead to poor absorption of proteins, carbohydrates, fats, vitamins, minerals and water and affect the way the body utilizes food. Due to poor fat absorption, vitamins A and E are also poorly absorbed. These two vitamins are important for proper functioning of the immune system.

- **Changes in metabolism**

In HIV/AIDS, changes in metabolism may occur as a result of poor nutrient absorption, severely reduced food intake, anorexia, infections and illnesses and poor food digestion particularly proteins, fats and carbohydrates. These changes force the body to use up its fats and carbohydrates stores from muscle and other tissues. As changes continue, the body begins to break down proteins to produce glucose as a source of energy. The changes cause protein loss and muscle wasting.

1.4.2 Indirect effects

HIV/AIDS has an impact on household food security because often PLWHA are too weak to work. Also, many family members are drawn away from production and income generating activities to care for sick relatives. In addition, valuable resources, savings and income are diverted for treatment, which result in low food accessibility, thus reduced food intake.

1.5 The need for the Guide

Although there is a strong relationship between nutrition and HIV/AIDS as depicted above, it has been observed in Tanzania that little attention has been paid to nutrition care. Most of the existing services for PLWHA provide medical, nursing care, psychological and spiritual support. Nutrition care is accorded very little consideration due to inadequate information, knowledge and skills on nutrition management of PLWHA. As such, nutritional interventions of different programmes are often not harmonized thus causing confusion and resentment to the PLWHA and their caregivers.

The purpose of this Guide is therefore to provide appropriate, consistent and up to date information and guidance on nutrition care and support for PLWHA. Moreover, the Guide is expected to harmonize nutrition care and support provided by various service providers.

To facilitate this it is therefore very important to integrate nutrition care and support into programmes and services related to HIV/AIDS for better achievement of good health and nutrition for PLWHA.

1.6 Target Groups

The Guide is developed for use by those who are in position to provide services to PLWHA especially programme managers, counsellors, service providers, caregivers as well as policy makers. The beneficiaries are PLWHA.

1.7 The use of the Guide

There are six chapters in this Guide. The Guide provides basic information on nutrition and HIV/AIDS, nutrition considerations for PLWHA, dietary management of HIV/AIDS related complications, nutritional issues associated with different therapies, household food security in relation to HIV/AIDS and nutrition support for PLWHA. The chapters provide a range of information on nutrition care and support that target groups can select and translate, adapt and share with communities and households for appropriate actions.

CHAPTER TWO

2.0 NUTRITION CONSIDERATIONS FOR PLWHA

Good nutrition is essential for good health and is a result of eating a healthy diet, which is necessary for building, maintenance and repair of body cells and tissues. A healthy diet, particularly for those living with HIV/AIDS can be achieved by choosing and eating a variety of foods that provide energy, proteins, vitamins, minerals and water.

2.1 Food Groups

People living with HIV/AIDS should choose and eat foods from different food groups at each meal. These food groups include:

- **Cereals, cooking bananas , roots and tubers**

Cereals such as maize, rice, millet, wheat, sorghum; green bananas and roots and tubers such as yams, cassava, potatoes and provide energy as well as vitamins, minerals and protein.

- **Pulses, nuts and foods of animal origin**

Pulses such as beans and peas; nuts such as groundnuts and cashew nuts and foods of animal origin such as meat, fish, eggs and milk provide mainly protein as well as vitamins and minerals.

- **Fruits**

Fruits such as pawpaws, mangoes, oranges, tangerines and pineapples as well as wild fruits such as baobab fruits, *mabungo* and *ukwaju* are good sources of vitamins and minerals.

- **Vegetables**

Vegetables such as sweet potato leaves, cassava and pumpkin leaves; *amaranth*, okra, carrots, pumpkins, tomatoes as well as indigenous vegetables such as *mlenda*, *mchungu*, *figiri* and *mnavu* provide vitamins and minerals.

- **Sugar, fats and oils**

Fats and oils such as ghee, butter, coconut oil, margarine, sunflower and palm oil and sugars such as honey and cane sugar provide concentrated form of energy.

2.2 The importance of selected nutrients in HIV/AIDS

A healthy eating pattern and lifestyle will strengthen the immune system. Some nutrients have particular importance in maintaining a healthy immune system especially for PLWHA. It is therefore necessary to eat a variety of foods to provide nutrients. These nutrients are:

- **Carbohydrates**

Carbohydrates provide energy to make the body work and keep active. For PLWHA the amount of energy needed to meet the requirements is increased by

10-15 percent, therefore it is important to encourage intake of enough energy-rich foods to meet the increased needs. Carbohydrate foods include cereals, cooking bananas, roots and tubers.

- **Protein**

PLWHA have additional protein requirements of about 50 to 100 percent. When a person does not eat enough protein, the body begins to break down its muscles resulting in weight loss and muscle wasting. Moreover, when a person does not eat sufficient carbohydrates the body will use its stored protein for energy. Therefore, it is important for PLWHA to eat enough carbohydrate foods to meet their requirements so as to avoid the use of stored protein which is highly needed by this group. Pulses, nuts and foods of animal origin are good sources of protein.

- **Fats**

Fats provide a concentrated form of energy. Use fat only in moderation preferably of plant origin such as coconut oil, margarine, sunflower and palm oil. Other sources of fat are ghee and butter.

- **Vitamins and minerals**

Vitamins and minerals help to build a strong immune system and keep the linings of the lungs and the gut intact. This makes it more difficult for germs to enter the body and cause infection. Some vitamins such as A, C, E and minerals such as selenium, zinc and iron act as antioxidants. They are associated with protection of body cells and damage from infections and some cancers. Main sources of vitamins and minerals are fruits and vegetables. Table 1 shows some of the vitamins and minerals, their functions and food sources.

- **Dietary fibre**

Food high in dietary fibre helps to promote bowel function and as a result it can prevent and sometimes treat constipation. Good sources of dietary fibre include fruits and vegetables, unprocessed cereals as well as legumes.

- **Water**

Although water is not food, it may be regarded as the number one most important nutrient. It is the body's principle transporting agent and indispensable participant in metabolic activities of all cells. Clean and safe water is essential for PLWHA to avoid contamination and water borne related diseases.

Generally, good nutrition has multiple positive effects for PLWHA including the following:

- Prevents muscle wasting which is one of the causes of death to people with AIDS;
- Delays the progression of HIV infection to AIDS;
- Replenishes the body with lost vitamins and minerals for body protection;

- Enhances the body's immune system and the ability to fight opportunistic infections, hence reducing the cost of health care;
- Improves the effectiveness and tolerance to drug treatments that the HIV/AIDS person undertakes;
- Achieves and maintains optimal body weight and strength;
- Keeps PLWHA active and enables them to take care of themselves; and
- Supports household food security through reduced medical expenditures and increased ability of PLWHA to contribute to family income and production.

Table 1: Selected nutrients important for PLWHA, their sources, deficiencies and excess

Nutrient	Role	Major sources	Effects of deficiencies	Effects of excess intake
Vitamin A	Maintenance of epithelial cells, mucous membranes and skin. Growth and function of T and B cells for immunity.	Dairy products, dark green leafy, orange, yellow vegetables, and fruits. Animal products, fish, sardine.	Infections, night blindness, lymphoid tissues, skin and kidney problems.	Headache, nausea, vomiting, diarrhoea, decreased appetite, weight loss, joint pain.
Thiamine (Vitamin B ₁)	Important for energy metabolism; support appetite and nervous system functions.	Whole grain cereals, meat, poultry, fish, liver, milk, eggs and legumes.	Beriberi, fatigue, decreased appetite.	Inflammation of the skin, dizziness, convulsions, body weakness, paralysis
Riboflavin (Vitamin B ₂)	Important for energy metabolism; supports normal vision; health and integrity of skin.	Milk, meat, fish, green leaves, whole grain cereals and legumes.	Skin rash, light hypersensitivity, cracks at corners of mouth.	Toxic in high hypodermic dosage.
Niacin (Vitamin B ₃)	Essential for energy metabolism; support health and integrity of skin, nervous and digestive systems.	Milk, eggs, meat, poultry, groundnuts, whole-grained cereals, fish.	Weakness, anorexia, mouth sores, diarrhoea, indigestion and various skin eruptions.	Skin flashing, gastrointestinal distress and itching.
Pyridoxine (Vitamin B ₆)	Facilitates metabolism and absorption of fats and proteins; helps to make red blood cells.	Sweet potato, white beans, maize, avocados, cabbage, meat, fish.	Anaemia, irritability, muscle twitching, convulsion, skin lesions, mouth sores.	Very toxic in high hypodermic dosage, neurological damage.
Cobalamin (Vitamin B ₁₂)	Important for new cell development and maintenance of nerve cells.	Red meat, fish, chicken, shellfish, cheese, eggs and milk; fermented products.	Anaemia, numbness, cold limbs, weakness, lack of appetite nerve degeneration.	No toxicity symptoms known.
Folate (folic acid)	Required for building new cells, especially red blood cells and gastrointestinal cells.	Liver, green leafy vegetables, fish, legumes, groundnuts, oil seeds avocado, oranges.	Anaemia, heartburn, inflamed tongue, oral lesions, diarrhoea, fatigue, confusion.	Toxic in large doses, may damage kidneys, decreased zinc availability.
Ascorbic acid (Vitamin C)	Helps the body to use calcium and to build bones and blood vessel walls. Increases non-haem iron absorption. Increase resistance to infection and acts as an antioxidant. Important for protein metabolism.	Citrus fruits such as oranges and lemons; green leaves, tomatoes, baobab, tamarind, guava, peppers, potatoes, yams, cooking bananas, and fresh milk.	Anaemia, infection, bleeding gums, muscle and/or joint pain rough skin, poor wound healing, depression, loss of appetite, fatigue, immune suppression.	Nausea, rash, abdominal cramps, diarrhoea, kidney stones, haemolysis, fatigue, interferes with copper absorption.
Vitamin E	Acts as an antioxidant. Protects cell membranes and metabolism, especially red and white blood cells. Facilitates resistance against diseases, particularly in the lungs.	Green leafy vegetables, vegetable oils, whole-grain products, butter, liver, egg yolk, milk fat, nuts, seeds.	Anaemia, weakness, leg cramps, oxidative stress, immune suppression.	Gastrointestinal discomfort, fatigue, slowed blood clotting following injury.

Nutrient	Role	Major sources	Effects of deficiencies	Effects of excess intake
Iron	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.	Haem iron sources (high absorption) include red meat, liver, fish, poultry, and shellfish. Non-haem iron sources (low absorption) include eggs, legumes, peanuts, some cereals and dried fruits.	Fatigue, dizziness, headache, infection, decreased tolerance to cold, iron deficiency anaemia.	Liver toxicity, infections, constipation.
Calcium	Builds strong bones and teeth. Important for functioning of heart and muscles, blood clotting, maintains pressure and immune defence.	Milk, green leaves, dried fish, legumes, whole grain millet, oil seeds, okra and sardines.	Rickets in children and osteoporosis in adults.	Constipation, urinary stones and can interfere with absorption of nutrients.
Zinc	Reinforces the immune system. Acts as an antioxidant. Facilitates digestion. Transports Vitamin A, helps in wound healing.	Meat, chicken, fish, whole grain, cereals, legumes, vegetables, milk, cheese.	Impaired smell and taste, loss of appetite, anaemia, poor growth, impaired immunity, infertility.	Abdominal pain, epigastric pain, nausea, vomiting, diarrhoea, dizziness, interferes with absorption of calcium and copper.
Selenium	Prevents impairment of the heart muscle. Acts as an antioxidant.	Seafoods, liver, meat, carrots, onions, milk, eggs.	Weakness, pancreas damage, heart disease, immune suppression, oxidative stress.	Brittle hair and nails, fatigue, nausea, dizziness, diarrhoea.
Iodine	Ensure the development and proper functioning of the brain and of the nervous system.	Fish and other seafood, iodated salt. Plants grown in iodine rich soil.	Iodine deficiency disorders ranging from severe cretinism with mental retardation to thyroid enlargement (goitre), abortion.	Thyroid enlargement, hair loss, nausea, diarrhoea, fatigue, changes in finger and toe nails.
Magnesium	Strengthens the muscles, important for nervous system function and protein synthesis. Involved in bone development, maintenance of teeth.	Cereals, dark green vegetables, seafood, nuts, legumes, groundnuts.	Spasms, muscle cramps, muscle weakness, abnormal skin sensations, constipation, growth retardation.	Thirst, drowsiness, damaged nerves, disturbs calcium-magnesium balance.
Protein	Build, repair and maintain the body cells and tissues. Makes the protective system of the body.	Meat and meat products, fish, poultry, eggs, dairy products, legumes, nuts.	Wasting, (primary muscle wasting), impaired immunity, oedema.	Excessive weight gain, obesity, reduced calcium retention, renal toxicity.
Carbohydrates	Main source of energy in the diet to make the body work and keep active.	Cereals, rice, cassava, potatoes, bananas.	Body weakness, loss of subcutaneous fats, muscle wasting.	Excessive weight gain.
Fat and oils	High-calorie energy source, helps in absorption and transportation of vitamin A, D, E and K.	Oil seeds, margarine, butter, nuts, meat, poultry, dairy products, fish.	Flaky and scaly skin, hair loss, impaired immunity.	Fatty diarrhoea (steatorrhoea), excessive fat accumulation.

Adapted from: Network of African People Living with HIV/AIDS, November 1997.
Wong G, HIV Disease: Nutrition Guidelines, Practical Steps for a Healthier Life, 1993.

2.3 Healthy lifestyle for PLWHA

It is essential for PLWHA to pay attention to all aspects of healthy lifestyle to stay healthy. These aspects are:

- **Healthy eating**

It is important for a person living with HIV/AIDS to eat a healthy diet as soon as one becomes aware of the HIV status. A healthy diet comes from eating a variety of foods from main food groups which provides all the nutrients in the correct proportions for proper functioning of the immune system.

Maintaining good nutrition will prevent weight loss and enhance the functioning of the immune system. It is usually difficult to reverse weight loss especially when a person is not feeling well. Preventing malnutrition should therefore be the primary goal for all PLWHA to enable them remain relatively healthy and have improved quality of life.

- **Eat variety of foods**

There is no single food that provides all the nutrients. A combination of various foods in a meal will improve nutrient content and facilitate absorption. It is essential that food choices be made from a wide selection of different foods whenever possible. This provides a healthy eating pattern and makes the food enjoyable. Choose foods from each of the following groups to make your meal:

- Cereals, cooking bananas, roots and tubers
- Pulses, nuts and foods of animal origin
- Vegetables
- Fruits
- Sugar, fats and oils.

- **Eat small meals frequently**

People living with HIV/AIDS may experience difficulties with food intake due to various complications such as thrush, nausea and vomiting. To ensure that PLWHA meet their nutrient requirement, it is important they eat smaller portions more frequently throughout the day.

- **Drink clean and safe water**

It is important for PLWHA to drink adequate clean and safe water everyday (1.5 to 2 litres or 8 glasses). Dehydration decreases muscle strength, endurance and coordination; and increases risk of cramps, heat exhaustion and life-threatening heat stroke.

- **Drink plenty of fluids**

Fluid is the other source of water. This includes fruit juice, milk, fermented drinks, coconut water and soups.

- **Choose food wisely**

Foods differ in their nutrient contents. Choose foods that will provide adequate nutrients. For example, when you have limited amount of money it will be wise to buy and eat nutritious foods such as oranges, groundnuts, eggs or milk instead of a bottle of soda, which will provide only sugar (energy) without other nutrients. Use locally available and acceptable foods such as insects and wild fruits. Also choose snacks that will provide you with nutrients.

- **Be physically active**

PLWHA need to be encouraged to continue with their daily routine activities as long as they are physically able to do so. For sedentary people exercises such as walking and jogging are encouraged. Avoid exercises that are tiring and stressful.

- **Practice safe sex**

Practicing safe sex by using a condom and having one partner is important to minimize the risk of repeated exposure to HIV infection, pregnancies and other Sexually Transmitted Infections (STIs).

- **Avoid smoking**

It is advisable for PLWHA not to smoke. Smoke from cigarettes reduce immunity and make PLWHA susceptible to infections such as Tuberculosis (TB).

- **Avoid alcohol**

People living with HIV/AIDS are advised to avoid taking alcohol. Alcohol interferes with the immune system by depleting the body of vitamins that are used to boost the immune system.

- **Get psychosocial support**

The needs of PLWHA go beyond nutritional and health care. They need emotional care and psychological support to cope with their situation.

- **Think positively**

Positive thoughts can create love, joy, peace and laughter which reduce stress and help the immune system to work well. Negative thoughts produce anger, hate, fear and sadness which stress the immune system.

- **Manage stress**

PLWHA should avoid physical and mentally stressful situations whenever possible. They should try not to worry too much and should keep positive attitude. They should also relax more with people they love, family, children and friends and try to do things they enjoy for example listening to music and reading, which will help them worry less about their situation.

PLWHA should also find support and get good advice. They should ask for information and assistance from a health worker or counsellor. A person who is

in supportive environment or in a support group is likely to survive longer than those dealing with their infection in isolation. PLWHA should also have time to rest. Breaks and naps throughout the day are necessary.

2.4 Food safety and hygiene

Food and water can be contaminated with harmful bacteria, viruses, parasites as well as chemicals or fungi. Food poisoning and infections can range from mild to severe bouts and in some cases can even cause death. Contaminated food can harm the body and cause infection that can be severe in PLWHA.

People living with HIV/AIDS are more vulnerable to infections and have thus to be more careful with the food they eat and the water they drink since any illness, including those caused by food and water could further weaken their immune system. They have to strictly observe food and water safety and hygienic practices since unhygienic preparation, handling and storage of food and water can lead to contamination thus causing infection. Therefore:

- Observe personal hygiene by washing hands thoroughly before handling food, covering all wounds and ensuring cleanness of the body and clothing;
- Observe hygiene in the kitchen by cleaning thoroughly food preparation surfaces and utensils;
- Ensure proper food storage and handling;
- Observe packaging, labelling and expiry dates for safety when using processed foods;
- Wash fruits and vegetables thoroughly when they have to be eaten raw;
- Blanch fruits and vegetables that can be eaten without peeling;
- If there is no safe water peel fruits and vegetables before eating;
- Cook thoroughly and handle well animal foods such as meat, fish, eggs and chicken to ensure their safety and to avoid cross contamination; and
- Ensure cleanliness and safety of water for drinking or making juices or ice-cubes.

2.5 Nutrition for PLWHA at different stages

Nutritional requirements differ according to the progression of HIV infection to AIDS. Eating well can help the body to fight back opportunistic infections and other conditions and help the body to improve the effectiveness and tolerance to medication. It is important for PLWHA to understand how to meet their nutrient requirements at different stages.

2.5.1 The asymptomatic HIV infected person

This is an HIV infected person who does not show any signs but may be just feeling tired. At such stage, building stores of essential nutrients and maintaining body weight and lean mass is very important. An infected person needs to practice healthy lifestyle by:

- Eating adequately wide varieties of foods to meet increased energy, protein, vitamins and minerals requirements;

- Doing exercises to stimulate appetite and build lean body mass;
- Ensuring food safety and good hygiene to prevent food and water borne diseases; and
- Avoiding or limiting alcohol consumption.

2.5.2 Early symptoms including some weight loss

At this stage some health problems may be experienced such as sore mouth and throat and diarrhoea. Infections put extra demands on the weakened immune system and increase the body's requirement for energy, protein and other nutrients. The illness and medication used may cause loss of appetite, or eating may be painful. At this stage a person living with HIV needs to minimize the consequences of the illness itself and poor food intake by:

- Maintaining dietary intake during illness;
- Increasing nutrient intake for recovery and weight gain;
- Continuing with physical activities;
- Managing conditions that affect food intake;
- Seeking medical attention immediately;
- Observing healthy lifestyle; and
- Maintaining food safety and hygiene.

2.5.3 Advanced stage of HIV/AIDS

At this stage the immune system is seriously weakened and opportunistic infections occur. Weight loss or wasting of muscles becomes a serious problem and diarrhoea becomes persistent. This person needs to:

- Be assisted by other family members physically, emotionally, mentally and spiritually;
- Seek treatment for opportunistic infections that affect appetite, food intake and utilization;
- Maintain food intake during periods of acute illness and depressed appetite;
- Be supported to keep physically active;
- Observe healthy lifestyle; and
- Maintain food safety and hygiene.

2.5.4 Nutrition for special groups

The groups that are considered to be special are children born to HIV positive mothers, adolescents and pregnant and lactating women.

2.6.1 Children born to HIV positive mothers

Children born to HIV positive mothers are at a high risk of malnutrition, illness and death. This can be due to HIV infection or inadequate care because of deteriorating health of one or both parents. It is very important that these children receive adequate care in health and nutrition and should be closely followed up. Their growth and development need to be monitored regularly.

Children infected with HIV need great care and attention because their immune systems are weakened thus increasing the risk of opportunistic infections, which can be severe. These children need extra energy, protein and other nutrients for growth, development and coping with the HIV infection. Children's nutrient requirements differ according to age.

- **Infants 0 to 6 months of age**

At this age, milk remains the only recommended food. The milk can be breastmilk, home prepared or infant formula. Babies in the first few months do not have enough enzymes to digest starch. The mother or caretaker should be counselled on infant feeding options by a trained counsellor. It is important to follow carefully the instructions required for proper and safe feeding. The mother should never breastfeed while at the same time giving other milk, juices, foods or water. Mixed feeding can injure the immature lining of infants gut and hence increasing the risk of HIV transmission from mothers' milk to the baby. Details on infant feeding and HIV/AIDS are available in the National Guidelines on Infant Feeding and HIV/AIDS.

- **Children 7 to 24 months of age**

All babies older than 6 months should be given complementary foods. Complementary foods are foods or liquids, whether manufactured or locally prepared, given in addition to breastmilk, infant formula or other milks to satisfy the nutritional requirements of the infant. Milk should still form an important part of the diet up to 2 years. Complementary foods commonly used are bulky and therefore need to be enriched so as to provide adequate protein and other nutrients. A good diet for a child should be made from a variety of locally available foods and the child should be fed frequently at least five times a day. If the child is sick, increase the frequency of feeding during and after the sickness. It is important to ensure that the amount of food consumed per day is adequate to meet nutritional needs.

It is important to give the child:

- Foods that are soft and easy to swallow;
- Plenty of foods rich in vitamins and minerals;
- Foods that are fermented such as *togwa* and yoghurt; and
- Clean and safe water for drinking.

Further, it is important to practice good hygiene and proper food handling and active feeding.

- **Children 2 to 5 years of age**

Children infected with HIV need extra health care. Their caretakers should seek medical attention immediately when these children are ill. Their growth should be monitored constantly. It is important to observe the direction of the growth curve (MCH clinic card no. 1) whether there is weight faltering and appropriate action should be taken immediately. Mothers or caretaker should be involved and encouraged to take their children to clinics monthly even when they are not sick.

They should attend clinics for growth monitoring and promotion, immunization, supplementation, health education and feeding consultations and counselling.

In addition, it is important to:

- Give a variety of foods that are soft and easy to swallow;
- Provide clean and safe water for drinking;
- Give nutritious snacks e.g. fruits and nuts;
- Enrich the food by adding milk, oil, nuts, sugar, margarine, germinated flour, honey;
- Give plenty of foods rich in vitamins and minerals;
- Give fermented foods e.g. *togwa* and yoghurt;
- Practice hygiene and proper food handling; and
- Practice active feeding of the baby.

- **Children 6 to 10 years of age**

Most children in this group get nutrients from family foods. HIV infected children may suffer from metabolic problems resulting in poor nutrient absorption and utilization. Attention should be given to ensure they get adequate nutrients to meet the increased requirements, therefore:

- Give a variety of foods that are soft and easy to swallow;
- Provide clean and safe water for drinking;
- Give nutritious snacks e.g. fruits and nuts;
- Enrich the food by adding milk, oil, nuts, sugar, margarine, germinated flour, honey;
- Give plenty of foods rich in vitamins and minerals;
- Give fermented foods e.g. *togwa* and yoghurt; and
- Practice hygiene and proper food handling.

2.6.2 Adolescents

In this group, the set of puberty and the final growth spurt of childhood occur. With the rapid growth, there is increased demand for energy, protein, vitamins and minerals. If a person in this age group is infected with HIV then, the demand of nutrients is even higher. It is important to ensure that all the required nutrients are provided by increasing the amount and quality of food.

2.6.3 Pregnant women

Good nutrition is essential during pregnancy for the well being of the mother and the foetus. All mothers need to increase food intake to support foetal growth and future lactation. They are also required to take supplements of ferrous sulphate and folic acid throughout pregnancy. Details on how it should be done are available in the National Micronutrient Deficiency Control Policy Guidelines for Supplementation.

An HIV infected woman should meet the nutrients demand of her pregnancy as well as those of HIV infection. She is encouraged to:

- Increase the frequency of eating;
- Increase amount of food;
- Eat a healthy diet from locally available foods; and
- Take recommended nutrient supplements daily.

In addition she needs to:

- Attend antenatal clinic regularly for proper follow up of her health;
- Get some time to rest during the day;
- Practice safe sex to avoid re-infection;
- Avoid smoking; and
- Avoid taking alcohol.

It is advisable for a woman infected with HIV to avoid becoming pregnant as it puts great strain on her health and also there is a risk of passing the virus to the baby. If an HIV positive woman becomes pregnant there is a need for special care during pregnancy, labour and after delivery, to reduce the risk of passing the virus to the baby. She should consult a health care provider on the availability of such services.

2.6.4 Lactating women

During lactation all mothers need extra nutrients for milk production. If a mother is malnourished, breast milk is produced at the expense of the mothers' stored nutrients. Mothers are advised to eat an equivalent of one extra meal per day. They should be supplemented with 200,000IU vitamin A once immediately after delivery or within 4 weeks after delivery.

A breastfeeding HIV positive mother needs to meet the increased nutrient demand for lactation as well as the HIV infection. She is encouraged to eat more frequently; eat a variety of foods from locally available foods and practice safe sex to protect herself and her baby. In order to reduce the risk of infecting the baby, a breastfeeding mother should prevent mastitis, breast abscess and sore or cracked nipples. If they occur they should be treated immediately. She should also seek early treatment of sores or thrush in the infant's mouth.

Mothers are encouraged to attend postnatal care clinics at 1st, 2nd and 6th week as recommended to check their health. At the clinics, mothers have to be assisted on how to care for themselves and their children to prevent problems, which may occur during this period. Family planning services should also be provided.

2.7 Nutritional supplements for PLWHA

People Living With HIV/AIDS need extra nutrients due to increased requirements, inadequate diet or poor absorption. As such, some nutrient supplements including energy dense and anti-oxidants may be required. It is important to remember that nutrient supplements do not replace nutrients from a healthy diet, but they should be an addition.

It should be noted that there are numerous nutritional supplements in the market today. The most expensive supplements may not necessarily be the best, or the ones advertised might not be better than those that are not. Therefore, one should be careful in selecting them. It is advisable to seek assistance from medical personnel or nutritionist and follow instructions. However, supplements can create dependency, therefore leaving less money for purchasing food.

CHAPTER THREE

3.0 DIETARY MANAGEMENT OF HIV/AIDS RELATED COMPLICATIONS

People living with HIV/AIDS may experience a number of complications, which make difficult the whole process of eating and digestion of food as well as absorption of nutrients. This is partly because the AIDS virus infects the gut causing diarrhoea and the HIV/AIDS patient might have many other illnesses or conditions such as fever, thrush, nausea and vomiting, which make eating difficult or reduce the appetite. As a result, nutrient stores of PLWHA are diminished and immune system weakened hence, the body fails to fight opportunistic infections and loses body mass.

To manage these problems, it is necessary to prepare a nutritious meal for PLWHA in such a way that it can be easily eaten to provide the body with sufficient nutrients. In turn, this will enable the body to boost its immunity and maintain desirable body weight, hence help them stay well for longer. However, different complications associated with HIV/AIDS require specific recommendations.

REMEMBER

The recommendations given for one condition might create problems to another condition. If you have more than one condition at a time, it is better to avoid the foods listed that might make the second condition worse. Always seek medical advice when the condition persists.

3.1 Diarrhoea and fat malabsorption

Diarrhoea is a condition whereby an individual has three or more watery or loose stools in 24 hours. It is caused by unsafe drinking water, infections, parasites or some medications. Moreover, fat and milk are the major food items causing malabsorption, which can result into diarrhoea. Diarrhoea causes dehydration, loss of nutrients, poor absorption, reduced appetite and malnutrition if it is persistent. Below are recommendations when diarrhoea occurs:

- Drink plenty of safe water.
- Drink plenty of fluids such as rice water, coconut water, soups, fruits juice, *togwa* or oral re-hydration solution to replace the water that is lost. Drink in between meals rather than with meals.
- Eat small frequent meals.
- Eat soft, mashed or liquidized foods that are easy to swallow and digest. Foods such as maize porridge, rice, potatoes and bread can be made soft.
- Consume fermented drinks such as sour milk, yoghurt or *togwa*. Avoid fresh milk as it might not be tolerated.

- Eat fruits such as bananas, mangoes, pawpaws and watermelon and vegetable soups like carrots, pumpkins, spinach and amaranth to replace minerals lost. Avoid strong or acidic fruits such as oranges, tangerines, and pineapples as well as vegetables such as onions and tomatoes.
- Use low fibre foods such as refined flour, mashed potatoes and cassava. Remove the skin of legumes such as peas, beans, pigeon peas and cowpeas.
- Limit fat or fatty foods by boiling, steaming, grilling, roasting or removing visible fat off meat or skin of chicken. Avoid deep fried foods.
- Eat slowly and chew well to facilitate digestion.
- Whenever possible prepare fresh food from fresh ingredients.
- Avoid foods and beverages that cause gas for example cabbage, onions, green pepper and carbonated drinks.
- Avoid caffeinated drinks such as coffee, tea and cola and alcoholic beverages because they inhibit the absorption of some vitamins and minerals.
- Avoid strong spices such as curry and pepper because they irritate the gut.

3.2 Poor appetite and taste changes

Lack of appetite in PLWHA is very common. It can be caused by infection, depression, anxiety, tiredness or taste changes. On the other hand, changes in the taste for the food can be a result of drug side effect, poor nutrition and infection. In either case, it is important to eat sufficient nutritious food to avoid weight loss, nutritional deficiencies and maintain strength. Below are some ways for improving appetite and taste for food:

- Choose and prepare foods that look and smell good to you. Food may taste better if served at room temperature.
- If a certain food tastes different or has a strong smell, try alternative foods. For example meat can be replaced with fish, chicken, beans or dairy products.
- Use spices such as onions, garlic, cinnamon and ginger to stimulate appetite, improve flavour and assist digestion.
- Add sugar to some foods to decrease bitterness or unpleasant taste.
- Eat foods you like most. Vegetable and chicken stew, sweet potatoes soup and bananas are usually tolerated best.
- Eat foods that provide energy such as *ugali*, bread, cassava, potatoes, rice, yams and bananas.
- Add a small amount of fat or oil to food to increase energy content and make food easy to swallow.
- Eat varieties of small meals more frequently.
- Take plenty of fluids in between meals, and not with meals. Lemon juice can help to stimulate appetite.
- Eat whenever you feel like eating and if you do not feel like eating at all, force yourself to do so.
- Eat with others as this makes food more enjoyable.

- Avoid alcohol intake as it reduces appetite and weakens the body.
- Rinse your mouth and brush your teeth regularly.
- Exercise frequently to stimulate appetite.

3.3 Sore mouth, throat and thrush

Sores and thrush in the mouth and throat are common in PLWHA. Such problems make eating uncomfortable and painful hence interferes with food intake. Below are some ways to help PLWHA cope with this situation:

- Eat soft, mashed or moist foods such as potatoes, pumpkins, avocado, pawpaws or bananas.
- Drink soothing beverages such as fruit juices, soups and milk if diarrhoea is not a problem.
- Drink sour milk to prevent yeast from growing.
- Use soup, butter or margarine to soften your food if nausea or diarrhoea is not a problem.
- Avoid sugary foods and drinks because sugar facilitates the growth of thrush in the mouth and throat.
- Avoid very irritating foods such as spicy and salty foods.
- Avoid very cold and hot foods and drinks.
- Avoid very sour fruits such citrus fruits, pineapples and grapes.
- Avoid rough, coarse, hard or dry foods such as chips, crisps, roasted maize, popcorns or raw vegetables.
- Avoid alcohol and tobacco. They can irritate and damage the delicate membranes in the mouth.
- Rinse your mouth several times a day with warm salty water or bicarbonate of soda mixture to remove remaining food and promote healing.

3.4 Nausea and vomiting

Nausea and vomiting are recurrent conditions for most PLWHA. These conditions can be brought about by food odour, medication, infection or gas in the stomach. They can also result into reduced appetite and food intake. These conditions can be managed by doing the following:

- Eat small meals frequently. Nausea is worse when you are hungry.
- Chew food properly to facilitate digestion hence decrease the feeling of nausea.
- Try eating sour or salty foods or drinking lemon juice, herbal or ginger drink to reduce nausea. Smell of fresh orange or lemon peel can also help.
- Drink plenty of fluids in between meals and not just after meal.
- Choose foods that are not oily, fatty or sweet.
- If vomiting occurs, take fluids such as soup, juices, coconut water or safe water.
- Increase ventilation when preparing food or eating.

- Sit up or lie on high pillow when eating and wait at least an hour after eating before lying down to avoid vomiting.
- Try to recognize and avoid food, smell or event that trigger nausea.
- Avoid coffee and any other drink containing caffeine and alcohol.
- Avoid strong flavoured or spiced foods.

3.5 Fever

Fever causes an increased metabolism, which in turn leads to increased nutrient requirements. Therefore, whenever fever prevails:

- Drink plenty of fluids such as safe water, citrus fruit juice, lemon tea or coconut water to prevent dehydration and regulate body temperature.
- Take energy rich foods such as germinated cereal porridge, *togwa* or enriched soup.
- Eat small portions of food frequently to meet increased body requirements.

3.6 Heartburn and peptic ulcers

Heartburn and peptic ulcers may bring eating and digestion problems to PLWHA. These conditions can be managed by doing the following:

- Eat slowly and chew properly to facilitate digestion.
- Eat small portions of food frequently.
- Avoid high acidic juices and soups such as citrus fruit juices and tomato soup.
- Boil or steam food rather than frying.
- Avoid gas-forming foods such as beans, cabbage, onions and carbonated drinks.
- Avoid alcohol and smoking and reduce coffee intake as they stimulate gastric acid secretion. Also avoid strong spices such as curries and pepper.
- Avoid sleeping immediately after eating to allow food to be digested.
- Avoid stressful life.

3.7 Weight loss

Weight loss in PLWHA is caused by increased demand of nutrients, not eating enough food or poor absorption of nutrients. As a result, the body draws on its reserve stores of energy from body fat and protein from muscles. This leads to weakening of the immune system and muscle wasting. Below are some suggestions to help weight gain:

- Increase the amount and variety of food intake and frequency of consumption.
- Increase the energy density and protein content of your meal by adding margarine, sugar, honey, nuts, milk, oily seeds and eggs.
- Drink between meals and not with meals.
- Use fermented food such as *togwa* and sour milk to improve absorption of nutrients.

- Squeeze lime, lemon or orange juice or add their grated skin over fatty foods to enhance digestion and absorption of fat.
- Use spices in moderation to improve taste of food.
- Chew food well before swallowing to ease digestion.
- Slowly increase the fat content of your food. Fat makes the food more appetizing and supplies extra energy.
- Eat fruits and vegetables daily.
- Take snacks between meals. Eat nuts, fruits, roasted bananas, cassava or potatoes.
- Exercise regularly.

3.8 Anaemia

Anaemia in PLWHA is most often due to deficiency of iron in the diets, malaria infection and worms infestation. It has been shown that for a HIV infected person who is anaemic the progression to AIDS is faster. The common characteristics of anaemia are tiredness, weakness and paleness in the eyes lids, tongue, nails and palms. Anaemia can be managed by:

- Eating foods rich in iron such as fish, meat and liver, *amaranth*, spinach, cassava leaves, potato leaves, pumpkin leaves, beans, peas, pigeon peas and nuts.
- Eating fruits rich in vitamin C such as oranges, tangerines and pineapples with meals to enhance iron absorption.
- Seeking medical help for iron supplements if necessary and treatment of malaria or worms.

3.9 Constipation

Constipation can be caused by a diet low in fluids and fibre, lack of physical activities and some medications. To manage the problem:

- Eat high fibre foods regularly such as fresh fruits, vegetables, unrefined cereals and legumes.
- Avoiding taking foods or drinks that may interfere with iron absorption during meals. Such foods include tea or coffee, but may be taken an hour before or after meals.
- Drink plenty of fluids including safe water, fruit juices, coconut water, *togwa* and soups.
- Limit gas-forming foods like cabbage, onions and carbonated drinks.
- Increase physical activities to improve digestion.
- Avoid use of medicines that soften the stool because they can cause loss of water and salt.

3.10 Tuberculosis (TB)

Tuberculosis commonly affects lungs and other parts of the body such as kidneys, spine and digestive tract. A person with TB may experience similar complications like those of HIV/AIDS. These include fever, loss of weight, diarrhoea, loss of appetite, nausea and vomiting. Such complications can be managed in the same way as already discussed earlier in this chapter.

However, some medications may interfere with nutrient absorption or metabolism. For example isoniazid affects metabolism of vitamin B₆. Therefore, take foods high in protein, energy, iron, vitamin C and those rich in vitamin B₆ (see table 1).

3.11 Cold, flu and cough

To deal with cold, flu and cough:

- Increase intake of fruits and vegetables rich in vitamin C such as *ukwaju*, *mabungo*, *baobab* juice, citrus fruits, plums, mangoes, *zambarau*, guavas, tomatoes and potatoes.
- Drink plenty of fluids.
- Add ginger, cinnamon, lemon, garlic and onions in drinks and food. These remedies have been found to have a soothing effect.

3.12 Skin conditions

Skin conditions include sores, rashes and dry patches. Among the causes of poor skin conditions include deficiency of vitamins A and B₆. Control the problem by eating:

- Foods rich in vitamin A such as liver, dairy products, kidney, eggs, fish, dark green vegetables, pumpkins, palm oil, carrots, yellow sweet potatoes and pawpaw.
- Foods rich in vitamin B₆ such as beans, cabbage, sweet potatoes, maize, avocado, fish and meat.

CHAPTER FOUR

4.0 NUTRITIONAL ISSUES ASSOCIATED WITH MODERN AND TRADITIONAL THERAPIES

People living with HIV/AIDS are constantly using medications that may result into negative drug-nutrient interactions. Such interactions include poor absorption, poor appetite and altered metabolism, which consequently lead to reduced food intake, weight loss and other nutritional problems.

Traditional therapies are used as complementary or alternative therapies. Though many of them appear to help some people, scientific evidence on their effectiveness is often lacking. These therapies should therefore be approached with great caution.

4.1 Nutrition and modern therapies

Antiretrovirals (ARVs) and other drugs that are used for treating opportunistic infections can influence how the body uses the food and nutrients. Likewise, foods that are eaten can affect the way the medicines work. Both cases can cause side effects which have nutritional implications. People who take many different types of medicines have a higher risk of developing side effects. The side effects as shown in table 2 can be managed as discussed in chapter 3. Therefore, maintaining adequate nutrition may be one of the most important ways of maximizing the effectiveness of medical treatments.

Table 2 shows some of the medications used by PLWHA, their nutrition related side effects and dietary recommendations. It is important to consult a pharmacist or health care provider for instructions on how best to take medications.

Table 2: Medications used by PLWHA, their nutrition related effects and dietary recommendations

Medications	Nutrition related effects	Dietary Recommendations
Zidovudine (AZT, ZDV, Retrovir)	Anaemia, nausea, vomiting. Given with food decreases Peak Plasma Concentration (PPC) by >50%	Take on empty stomach or with low fat meal. Avoid alcohol.
Lamivudine (3TC, Epivir)	Given with food decreases PPC by >50% Diarrhoea, nausea, vomiting	Can be taken with meals, Avoid alcohol.
Zidovudine – Lamivudine (Combivir, AZT-3TC)	Decreases PPC by >50% if taken with food	Take with low fat meal if on empty stomach is not possible, Avoid alcohol.
Zidovudine-Lamivudine-abacavir (Trizivir, AZT-3TC-ABC)	With food PPC is decreased by >50%	Take on empty stomach, if possible. Taking with low fat meal reduces gastrointestinal (GI) side effects.
Didanosine (ddl, Videx)	Nausea, vomiting, diarrhoea: Food decreases absorption if taken with alcohol exacerbates toxicity, also results in 55% decrease in Area Under the Concentration-time Curve (AUC)	Take on empty stomach at least 30 minutes before or 2 hours after a meal. Avoid alcohol.
Stavudine (d4T, Zerit)	Nausea, anaemia	Can be taken with or without meals. Avoid alcohol.
Tenofovir (Viread)	Taking with high fat meal increases AUC by 40%	Take with food.
Efavirenz (Sustiva – EFV)	Low fat meal improves tolerability. High fat meal increases bioavailability by 50%	Can be taken with or without meals; however, avoid high fat meal. Avoid alcohol
Saquinavir (Invirase, Fortavase)	Taking with food increases AUC, nausea, diarrhoea, abdominal pain	Take with meal or up to 2 hours after a full meal. Avoid alcohol
Nelfinavir (Viracept, NLF)	2 – 3 fold increase in AUC with food, Diarrhoea	Take with a meal that includes high protein food to increase absorption and to decrease GI side effects
Ritonavir (Norvir, RTV)	Taking with food increases AUC \approx 15%. Nausea, vomiting, diarrhoea, taste disturbance	Take with meals if possible

Medications	Nutrition related effects	Dietary Recommendations
Indinavir (Crixivan, IDV)	Taking with high fat, high protein meal decreases serum concentrations by 84% and decreases AUC by 77%	Take on empty stomach at least 1 hour before or 2 hours after a meal or take on empty stomach or with low fat, light meal.
Lopinavir-ritonavir (Kaletra, LPV-RTV)	Absorption is increased if taken with food high in fat	Take with meals, especially with high fat content
Trimethoprim + sulphamethoxazole (Septrin)	Nausea, vomiting and abdominal pain	Take with food
Rifampin	Nausea, vomiting, diarrhoea and loss of appetite.	Take on empty stomach 1-2 hours before meals
Isoniazid	Possible reaction with foods like bananas, avocado, yoghurts. May interfere with vitamin B6 metabolism	Take on empty stomach 1-2 hours before or after meals.
Sulfadoxine and Pyrimethamine (Fansider)	Nausea, vomiting, not recommended for breastfeeding women.	Take with food and continuously drink clean and boiled water.
Fluconazole	Nausea, vomiting, diarrhoea.	Take with food
Nystatin	Infrequent occurrence of diarrhoea, vomiting and nausea.	Take with food
Erythromycin	Gastrointestinal disturbances, nausea, vomiting	Take with food
Acyclovir	Nausea and/or vomiting, diarrhoea, anorexia.	Take with food
Metronidazole	Gastrointestinal upset, furred tongue, unpleasant taste.	Take with food

Adapted from: Nerad J et al; 2003, General Nutrition Management in Patients Infected with HIV, Clin Inf Dis 2003; 36(Suppl 2): S52-56
MoH, Tanzania 2002, National Guidelines for Clinical Management of HIV/AIDS
FANTA (2001), A Guide for Nutrition, Care and Support

4.2 Commonly used traditional remedies for different ailments

Traditional remedies are foods and herbs used for treating illnesses commonly occurring to people including those living with HIV/AIDS. They may relieve nausea, improve digestion, stimulate appetite and keep the body warm. However, some of these therapies are expensive and require avoidance of certain foods which may reduce food intake.

It is important to recognize that traditional therapies may deprive people of the resources for buying food. Moreover, their effects may not be the same for all people and do not replace healthy eating. Table 3 provides some of the selected traditional remedies commonly used in sub-Saharan Africa including Tanzania.

Table 3: Commonly used traditional remedies and their function

Traditional remedy	Function	Its use
Garlic (<i>Kitunguu Saumu</i>)	Has antibacterial, antiviral and antifungal function particularly in the gut, lungs and vagina. Helps digestion and relieves feeling of weakness. It is good for thrush, throat infections, herpes and diarrhoea.	- Prepare as energy drink (see Annex I) or use in food - Can be eaten raw
Lemon (<i>Limau</i>)	Cleans digestive tract, Aids digestion especially of proteins and fats. Good for sore throat, stress, cough and fever.	- Put grated lemon skin or fresh lemon juice over fatty foods. Prepare as tea or juice. Do not use too much to avoid much acid.
Cayenne (<i>Pilipili</i>)	Stimulates appetite, helps fight infections, helps heal ulcer and intestinal inflammation.	- Add a pinch to cooked or raw foods. For an energizing drink, add cayenne to fruit juice or water.
Cinnamon (<i>Mdalasini</i>)	Good for cold and for feeling weak after a cold or flu. Good for diarrhoea, nausea mouth sores, skin fungi and stimulates appetite and bowel movements.	- Use it either in addition to your meals or in tea, desserts, milk, and warm fruit juice.
Cloves (<i>Karafuu</i>)	Stimulates appetite, helps weak digestion, diarrhoea, nausea and vomiting, has warming effect.	- Use in soups, stews, warm fruit juices and tea.
Coriander (<i>Giligilani</i>)	Helps to increase appetite, flatulence, control bacteria and fungi.	- Use in cooking as fresh, dried or powdered. Use in salads, stew and soups.
Eucalyptus (<i>Mkaratusi</i>)	Has antibacterial function particularly for lungs. Eucalyptus oil from leaves increases blood flow and reduces symptoms of inflammation. Good for fever and shingles.	- Use as tea - Inhale evaporate from leaves to relieve cold and flu. - Use as cold compress on the affected site.
Ginger (<i>Tangawizi</i>)	Helps in nausea, vomiting, digestion diarrhoea, stomach cramps, gas	- Use as fresh, dried or powdered in cooking; fresh is best. - In stir-fries, stews, soups and ginger tea
Parsley (<i>Kotimiri</i>)	Stimulates stomach secretions and activities and produces a feeling of hunger. The seed is used to remove excess water in the body	- Add raw or cooked to food
Cardamom (<i>Iliki</i>)	Helps problems such as digestive pain, diarrhoea, nausea, vomiting and loss of appetite, has warming effect.	- Add to your food during cooking or prepare as tea.
Turmeric/Yellow root (<i>Binzari</i>)	Aids digestion, antioxidant. Helps in healing of the gut wall, stomach, mouth and gums, helps in diarrhoea.	- Use as powder, in rice, cereals and stews.
Basil (<i>Mrehani</i>)	Helps to relieve nausea and aid digestion; has an antiseptic function for mouth sores	- Add to food - Use as gargle for mouth sores
Honey (<i>Asali</i>)	Good for mouth sores, thrush, cough and wounds	- Mix with squeezed whole lemon juice for cough and thrush - Apply on wounds.
Pawpaw (<i>Papai</i>)	Good for skin rashes, thrush and mouth sores	- Eat green pawpaw as relish - Crush pawpaw leaves and paste on the rash.

Adapted from: FAO, 2002

CHAPTER FIVE

5.0 HOUSEHOLD FOOD SECURITY AND HIV/AIDS

Household Food Security (HFS) means adequate access for all members of the household to sufficient amount of food of the right quality to satisfy the dietary needs throughout the year. A household is said to be food insecure if it doesn't meet these requirements.

The most vulnerable groups in food insecure households include children below five years of age, women of childbearing age, the elderly, persons with disabilities and PLWHA. Improved HFS is therefore essential for maintaining good health and nutrition for PLWHA.

Most of the PLWHA are in the productive age. This has a negative result on the ability of the household to meet its requirements in different aspects of life. HIV/AIDS related complications and deaths affect HFS through different ways including:

- PLWHA may be too weak to work for long hours. This results in both reduced food production and earnings in the household;
- PLWHA may fall sick from time to time therefore need to be cared for by family members or relatives. The caregivers decrease the amount of time spent in production or income generating activities;
- Households' tangible assets, savings and income may be used for treatment and care instead of being used for other productive activities;
- Coping with HIV may result in changes in agricultural production by decreasing the area cultivated; or changing to less labour intensive crops or reduction in number of livestock. These changes may affect availability of food or the quality of food consumed by the affected household;
- Loss of inter-generational knowledge about crop and livestock production methods due to premature deaths of those who are expected to pass the knowledge;
- As food availability becomes limited, there is increased risk of malnutrition and susceptibility to other illnesses among household members; and
- In the long run, children are deprived of the right to education due to lack of resources to pay school fees, because they are required to assist in taking care of the sick or working to generate income for the household.

5.1 Actions to improve food security for households with PLWHA

● Household level

The household with PLWHA should ensure food security by considering the following:

- Involvement in income generating activities such as small livestock and poultry keeping;
- Involvement in food production e.g. small gardening for consumption as well as for generating income;

- Using money economically and wisely for example by purchasing cheaper but nutritious foods and other seasonal or locally available foods;
- Selling of extra assets or unnecessary belongings such as livestock and jewellery to generate extra income to buy food;
- Improving food preparation and practices to minimize nutrient loss and enhance nutrient bioavailability;
- Strengthening the food storage facilities;
- Practising proper food handling including food storage and processing to minimize post harvest losses;
- Ensuring food safety by adhering to practices of food safety and hygiene as outlined in section 2.4; and
- Seeking assistance from government or other institutions including Non-Governmental Organizations (NGOs) and Community Based Organizations (CBOs).

- **Village level**

The village government should among other things:

- Facilitate awareness creation amongst community members on HIV/AIDS so that PLWHA and their households are neither stigmatised nor discriminated, hence threatened in terms of HFS;
- Facilitate community-led vulnerability assessment and monitoring of food security;
- Ensure that food security for households of PLWHA and their family members is a standing agenda on the village meetings;
- Integrate actions aimed at improving HFS for PLWHA into the village development plans;
- Mobilize the needed resources (material, financial, human and time) for carrying out interventions aimed at improving food security for households with PLWHA; and
- Solicit support from the councils, party and ward leadership for the implementation of planned activities for food security of household of PLWHA.

- **Ward level**

The Ward Development Committee (WDC) has the strategic role of supporting relevant action undertaken by villages. The WDC should among other things:

- Initiate and support monitoring of actions by different villages aimed at improving household food security for PLWHA.
- Ensure that food security for households with PLWHA is a permanent agenda for the WDC meetings;
- Integrate actions aimed at improving HFS for PLWHA into the ward development plans;
- Coordinate and support extension staff in rendering technical support to household with PLWHA for improved household food security;
- Mobilize resources at ward level for improving HFS;

- Ensure that relevant policies, guidelines, legislations and actions aimed at improving HFS for PLWHA in different villages are adhered to; and
- Solicit support from the councils, party and village leadership for the implementation of the planned activities for food security of the household with PLWHA;

- **The Government**

The government at district, region and central levels should among other things:

- Emphasize and support food production;
- Facilitate vulnerability assessment;
- Ensure monitoring of HFS;
- Facilitate and promote growth monitoring;
- Facilitate community-led development programmes and link with other health programmes;
- Facilitate development of food programmes at community level;
- Facilitate income-generating activities at the community level;
- Coordinate actions taken by various stakeholders aimed at improving the HFS for PLWHA;
- Formulation of relevant policies, guidelines, legislation and actions aimed at improving HFS for PLWHA;
- Integrate actions aimed at improving HFS for PLWHA into the development plans;
- Mobilize resource for improving HFS for PLWHA; and
- Collaborate with various partners in implementing various household food security actions.

5.2 Monitoring of household food security

In monitoring HFS for PLWHA it is recommended that the following indicators should be taken into consideration:

- Household food production particularly food crops, fruits and vegetables and their diversification;
- Food expenditure. A household is likely to be food insecure if a small portion of its produce is left for consumption;
- Share of expenditure on food. Whenever less is spent on food especially when the main source of food is by purchasing, that household is likely to be food insecure;
- Food consumption. A household is likely to be food secured when the amount of calories consumed by its individuals per day is adequate;
- Assessment of food stores for physical verification of what and how much is available;
- Income and its sources. Households, whose incomes are small and obtained through labour intensive sources, are likely to be food insecure especially when the infected members are the ones who are economically productive;
- Selling of assets including livestock and household goods;
- Clinical assessment related to signs of nutrient deficiencies; and
- Anthropometrical data such as weight and height as shown in chapter six.

CHAPTER SIX

6.0 OTHER NUTRITION SUPPORT SERVICES FOR PLWHA

Caring for PLWHA involves meeting the nutritional as well as psychosocial needs of the sick person and balancing these with the needs of other members of the family and own needs. One should take note that while food nourishes the body, stress and loneliness are among other factors, which can worsen the HIV/AIDS situation. As such, a person caring for PLWHA has to deal with among other things nutrition education, nutrition counselling, fighting stigma and discrimination; and monitoring of the nutritional status of PLWHA.

6.1 Nutrition education

Nutrition education is a group of communication-based activities that are initiated for achieving a voluntary change in nutrition-related behaviour with the aim of improving the nutritional status of the target group. Essential to this process is the access to information by all stakeholders and partners. Access to correct and relevant nutrition information is vital to PLWHA as it enables them to make rational choices as far as healthy eating is concerned.

Nutrition education programmes should be based on the identified needs and the basic characteristics of the intended audience. These characteristics include location, sex, culture and socio-economic status. All information developed should be comprehensive enough to combine the four elements of communication namely formative, educative, persuasive and prompting. This is important for PLWHA so that they are able to make informed decisions and choices on nutritional needs.

Use of all types of communication techniques and media is encouraged as PLWA are heterogeneous group and the choice of technique and media should be based on individual or group attributes and not infection status.

For PLWHA, the minimal nutrition education package should include:

- Relationship between nutrition and HIV/AIDS;
- Nutritional requirements for PLWHA;
- Healthy lifestyle for PLWHA;
- Food and water safety and hygiene;
- Household food security;
- Dietary management of HIV/AIDS related complications;
- Nutritional issues associated with modern and traditional therapies; and
- Nutrition monitoring.

6.2 Nutrition counselling

Counselling is a process of dialogue and mutual interaction aimed at facilitating problem solving, understanding, motivation and decision-making. It empowers individuals, families or specific groups to think and analyse systematically their own situations with regard to a specific issue. Counselling also helps them make

informed choices and commitment to take actions appropriate to their own situation.

Nutrition counselling is of utmost importance to PLWHA to enable them make appropriate food, behavioural and other social choices in various situations. It is also essential for caregivers so that they can provide better care.

Nutrition counselling can be conducted in a health facility, at home or at any other community premises. Observing privacy is very important whenever counselling is taking place. For people with HIV/AIDS, nutrition counselling will vary depending on the underlying nutritional situation, stage of the infection, specific conditions or complications, the socio-economic situation of the household and the community to which one belongs. Nutrition counselling will be based on the environment and the minimum educational package provided in section 6.1. Counsellors should observe high level of confidentiality to their clients.

6.3 Fighting stigma and discrimination against PLWHA

Stigmatisation is a process of devaluation of some individuals in a society. It lowers the value or worthiness and respect of some individuals in the eyes of others who tend to feel superior.

Discrimination occurs when a distinction is made against a person resulting in unfairly treatment and majesty on the basis of their belonging or being perceived to belong to a particular group. For example, families, care providers or community members may reject or isolate those living or believed to be living with HIV/AIDS.

Because of the stigma associated with HIV/AIDS and the discrimination that may follow for example in terms of accessibility to services or entitlements, this is likely to cause undue anxiety and distress in PLWHA, factors likely to lead to poor nutrition and ill health. Thus fighting against stigmatisation and discrimination is likely to contribute to the physical, mental and emotional health of PLWHA.

To minimize stigma and discrimination to PLWHA, the following should be done:

- Sensitise the community to understand how HIV is transmitted and that HIV is not transmitted by sharing food or utensils;
- To empower PLWHA economically by encouraging or giving support like initiating income generating activities;
- Advocating for their human rights;
- Encouraging PLWHA to join networks of HIV-positive people where they can get support including nutrition;
- Involvement of various stakeholders, including association of PLWHA, NGOs, CBOs, religious organisation, public and private in actions aimed

- at minimizing or decreasing stigma and discrimination against PLWHA; and
- Review training curriculum of various learning institutions to include HIV-Education to reduce stigma and discrimination.

6.4 Monitoring nutrition of PLWHA

Monitoring nutrition is an important aspect of nutrition care and support for PLWHA. A comprehensive nutritional assessment will include clinical assessment, measurement of dietary intake, anthropometric and biochemical measurements. For this Guide the following are minimum indicators that can be used when monitoring nutrition of PLWHA:

- **Weight against time**

It is a useful indicator for regular monitoring of changes in body composition. Check body weight regularly at least once a week. Weight loss of about 6-7 kg per month for an average person indicates onset of clinical AIDS.

- **Body Mass Index (BMI)**

It is one of the predictor of nutritional status which uses weight and height to measure body fat stores especially in adults. It is a ratio of weight in kilograms to height in meters squared. It is a useful indicator to assess an individual's nutritional status on the first contact (annex II).

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

The cut off points of nutritional status as defined by WHO are:

Underweight	-	when BMI is less than 18.5
Normal weight	-	when BMI is between 18.5 – ≤25.0
Overweight	-	when BMI is between 25.0 – ≤30.0
Obese	-	when BMI is above 30

- **Weight for age**

The weight for age indicator is often used to monitor nutritional status of children below five years of age. It requires serial weighing to be able to determine the dynamic picture of growth velocity and nutritional status (refer MCH card 1).

- **BMI for age and sex**

For young people aged nine to twenty four years, their nutritional status can be monitored using this index.

- **AIDS wasting syndrome**

Wasting, particularly loss of lean body mass, occurs when there is more than 10% loss of baseline body weight together with either chronic diarrhoea or

weakness and fever for one month or more in the absence of a concurrent illness other than HIV infection.

For a person with muscle wasting, it is important to check regularly the following:

- Food intake, appetite, frequency of eating, types of meals;
- Mouth sores;
- Frequency of vomiting and duration of diarrhoea;
- Episodes of fatty stools (steatorrhoea);
- Possible side effects from medications;
- Food security at individual level; and
- Body Mass Index (BMI).

- **Anaemia**

Anaemia can be monitored clinically or by laboratory methods. Clinical observation involves assessing paleness in the palms, eyelids, tongue and on the nail beds. Laboratory methods are used to measure haemoglobin levels. Table 4 shows the haemoglobin levels defining anaemia according to the WHO criteria.

Table 4: Haemoglobin cut off points used to define anaemia for different population groups

Population group	Anaemic if Hb is below
Adult men	13.0 g/dl
Non-pregnant women	12.0 g/dl
Pregnant women	11.0 g/dl
Children 12 - 13 years	12.0 g/dl
Children 5 - 11 years	11.5 g/dl
Children 6 months - <5 years	11.0 g/dl

Source: WHO/UNICEF/UNU, 1997

- **Diarrhoea**

Diarrhoea can be acute if it occurs suddenly and lasts for a short time or persistent if it lasts for more than 2 weeks. Therefore diarrhoea can be monitored by observing:

- The frequency (3 times or more in 24 hours);
- The duration (less or more than 2 weeks); and
- The consistence of the stools (loose or watery).

7. REFERENCES:

American Institute for Cancer Research (2000). Nutrition of the Cancer Patient. Washington, DC.

Bijlsma, M. (1997). Living Positively: A Nutrition Guide for People Living with HIV/AIDS. 2nd Edition, Mutare City Health Department, Mutare, Zimbabwe.

Cogill, B. (2001). Anthropometric Indicators Measurement Guide. Food and Nutrition Technical Assistance Project, Academy For Educational Development, Washington DC.

Department of Health (2001). South African National Guidelines on Nutrition for People Living with TB, HIV/AIDS and other Chronic Debilitating Conditions. Pretoria, South Africa.

FANTA (2001). HIV/AIDS: A Guide for Nutrition, Care and Support. Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington DC.

FANTA (2002). Supporting Integrated Food Security and Nutrition Programs to Improve Health and Well-being of Women and Children. Potential Uses of Food Aid to Support HIV/AIDS Mitigation Activities in sub-Saharan Africa. Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington DC.

FAO (1997). Agriculture, Food and Nutrition for Africa: A Resource Book for Teachers of Agriculture, Food and Nutrition Division, Rome.

FAO and WHO (2002). Living well with HIV/AIDS: A Manual on Nutritional Care and Support for People Living with HIV/AIDS. Rome, Italy.

Giraldo, R. (2003). Nutritional Therapy for the Treatment and Prevention of AIDS: Scientific Bases. A Paper Presented at the SADC Health Ministers Meeting, January 20th –21st Johannesburg, South Africa.

Joint United Nations Programme on HIV/AIDS (UNAIDS) and National AIDS Control Programme (NACP). (2004). Estimating and Projecting HIV/AIDS Epidemic in Tanzania, (Unpublished); Dar es Salaam, Tanzania.

Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organisation (2002). AIDS Epidemic Update.

King, FS. and Burgess, A. (1992). Nutrition in Developing Countries. Oxford University Press, Walton Street.

Latham, MC. (1997). Human Nutrition in the Developing World. FAO Food and Nutrition Series No. 29.

Network of Zambian People Living with HIV/AIDS (NZP+). (1995). Food for people living with HIV/AIDS. Hope production, Cape Town, South Africa.

O'Neil, J. and McKinney, MM. (2002). Care for the Caregiver: A chapter from A Clinical Guide to Supportive and Palliative Care for HIV/AIDS. US Department of Health and Human Services.

Piot P, Andersen P, Gillespie S, et al. (2001). Aids and Food Security. International Food Policy Research Institute, Washington DC.

Piwoz, E. and Preble, E. (2000). HIV/AIDS and Nutrition: A Review of the Literature and Recommendations for Nutritional Care and Support in sub-Saharan Africa. Support for Analysis and Research in Africa (SARA), Academy for Educational Development. Washington DC.

Regional Centre for Quality of Health Care (2001). Proceeding of the Workshop on the Development of National Nutrition Guidelines for Care and Support of People Living with/affected by HIV/AIDS. November. Jinja, Uganda.

Regional Centre for Quality of Health Care (2002). Improving the Quality of Care in Africa. Handbook on Developing and Applying National Guidelines on Nutrition and HIV/AIDS (Draft).

Riely F, Mock N, Cogill B, et al. (1999). Food Security Indicators and Framework for use in the Monitoring and Evaluation of Food Aid Programs. Food and Nutrition Technical Assistance Project, Academy For Educational Development, Washington DC.

Shevitz AB, Knox TA (2001). Nutrition in the Era of Highly Active Antiretroviral Therapy. Clin Infect Dis; 32: 1769-75.

Somi, GR (2002). An Overview of the HIV/AIDS Situation in Tanzania. A Paper Presented at the WABA Global Forum II, September 23rd - 27th, Arusha Tanzania.

Swindale, A. and Ohri-Vachaspati, P. (1999). Measuring Household Food Consumption: A Technical Guide. Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington DC.

Tanzania Food and Nutrition Centre (1998). Dietary Guidelines for People Living with HIV/AIDS. Dar es Salaam, Tanzania (Draft).

The Republic of Uganda, Ministry of Health (2001). Policy Guidelines on Feeding of Infants and Young Children in the Context of HIV/AIDS. Kampala, Uganda.

The United Republic of Tanzania, Ministry of Health (1997). Micronutrient Deficiency Control: Policy Guidelines for Supplementation. Dar es Salaam, Tanzania.

The United Republic of Tanzania, Ministry of Health (2003). HIV/AIDS/STI Surveillance Report. Report number 17.

The United Republic of Tanzania: Ministry of Health (2002). National Guidelines for Clinical Management of HIV/AIDS. Dar es Salaam, Tanzania.

The United Republic of Tanzania, Prime Ministers Office (2001). *Sera ya Taifa ya Kudhibiti UKIMWI*. November. Dodoma, Tanzania.

United Nations Administrative Committee on Coordination/Subcommittee on Nutrition (2001). Nutrition and HIV/AIDS. Nutrition Policy Paper No.20. October, Geneva.

WHO (1988). Requirements of vitamin A, Iron, folate and B₁₂. Report of a WHO expert consultation, FAO, Rome.

WHO (1995). Physical status: The use and interpretation of Anthropometry. Report of a WHO Expert Committee, WHO Technical Report series 845, Geneva.

Williams, SR. (1994). Essentials of Nutrition and Diet Therapy. Sixth Edition. Mosby, St. Louis, Missouri, USA.

Wolfe, WS. and Frongillo, EA. (2000). Building Household Food Security Measurement Tools From the Ground Up. Background Paper. Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington DC.

8.0 ANNEXURE

Annex I: Recipes

Recipe	Ingredients	How to prepare	Use
Banana soup (Mtori)	<p>4 cooking bananas e.g. matoke</p> <p>¼ kg meat preferably with bones</p> <p>Potatoes, yams or pumpkin (optional)</p> <p>1 medium size onions</p> <p>3 cups water</p> <p>1 tablespoon cooking oil</p> <p>Salt</p>	<p>Wash meat, cut into small pieces and cook until tender. Reserve some soup for mashing. Peel bananas, slice and wash in warm water. Add banana and other ingredients into meat and simmer for half an hour. Remove meat and mash the mixture thoroughly, then add soup to a desired consistency. Add salt to taste. Serve with meat.</p> <p>You may add yams, potatoes or pumpkin,</p>	<p>Nourishing and energy giving food.</p> <p>Good appetizer</p>
Beans paste	<p>1½ cup beans</p> <p>1 medium size onion</p> <p>1 teaspoon margarine</p> <p>1 tablespoon lemon juice</p> <p>Water</p> <p>A pinch of salt</p>	<p>Boil beans till very soft. Mash to make a smooth paste. Add chopped onion, margarine, lemon juice and mix.</p>	<p>Can be served with boiled potatoes, cassava or yams. It helps in weight gain.</p>
Beans porridge	<p>1 cup dried beans</p> <p>2 tablespoons peanut paste</p> <p>4 cups water</p> <p>Sugar or salt</p>	<p>Roast the beans and pound. Boil the pounded beans until soft. Add peanut paste and mix.</p> <p>Add sugar or salt to taste.</p>	<p>You may eat with boiled sweet potatoes, yams or cassava. Helps in weight gain.</p>
Carrot soup	<p>2 big carrots</p> <p>A pinch of ground cinnamon</p> <p>2 cups water</p> <p>A pinch of salt</p>	<p>Chop carrots. Bring to boil in water and cook slowly until soft. Mash the carrots. Add cinnamon and salt to taste.</p>	<p>Good for diarrhoea</p>
Energy power drink	<p>1 large garlic clove</p> <p>¼ teaspoon turmeric</p> <p>1 teaspoon finely chopped fresh or</p> <p>½ teaspoon ground ginger</p> <p>½ cup milk</p> <p>½ cup water</p> <p>1 teaspoon honey or sugar</p>	<p>Boil together all ingredients. Simmer for ten minutes. Cool slightly. Add honey or sugar if you like the drink to be sweet.</p>	<p>Drink 1 cup daily to strengthen the immune system. If you are sick, drink up to 4 cups per day. Replace milk with water if you have diarrhoea.</p>

Garlic drink	<i>4 cloves garlic</i> <i>1 cup water</i> <i>Honey or sugar</i>	Chop garlic and add to boiling water. Boil for ten minutes. Cover and allow it to cool. Add honey or sugar to taste.	Drink one cup in the morning, after noon and evening. It is good for sore throat .
Ginger and cinnamon drink	<i>½ teaspoon fresh ginger</i> <i>¼ teaspoon ground cinnamon</i> <i>1 cup water</i>	Bring water to boil and add fresh chopped ginger. Boil slowly for ten minutes. Add cinnamon. Cover and allow it to stand for five minutes. Strain to get a drink.	Drink one cup in the morning, afternoon and evening. Good for flu and cold .
Ginger drink	<i>3 teaspoons ginger</i> <i>1 small piece pineapple</i> <i>2 teaspoons sugar</i> <i>8 cups water</i>	Mix all the ingredients and leave in a warm place for a day in a clean and covered container. Or crush ginger in 4 cups of cold water and boil for ten minutes. Place in a covered container. Strain the ginger to get a drink.	Drink 1 cup in the morning, afternoon and evening. You can as well eat the pineapple Good for digestive problems .
Guava drink	<i>1 guava</i> <i>1 lemon</i> <i>1 eucalyptus leaf</i> <i>1 cup water</i>	Add chopped guava, lemon juice and eucalyptus leaf to boiling water. Cover and allow it to stand for five minutes.	Drink three times a day. It helps in persistent cold .
Lemon drink	<i>1 Lemon</i> <i>1 cup of water</i> <i>Sugar or honey</i>	Bring water to boil and cool slightly. Add lemon juice and sugar or honey to taste.	Serve warm Drink one cup three times a day for flu .
Onion drink	<i>¼ medium sized onion</i> <i>1 cup water</i>	Put peeled and chopped onion into boiled water. Cover and leave for five minutes. Strain to get a drink.	Drink one cup three times a day for blocked and running nose .
Oral Rehydration Drink (ORS)	<i>8 teaspoon sugar</i> <i>½ teaspoon salt</i> <i>1 litre water</i>	Add salt and sugar to previously boiled and cooled water. Stir or shake well.	ORS fluid is very important for any one who has diarrhoea .
Porridge enriched with power flour (Kimea)	<i>Any porridge flour</i> <i>1 tablespoon power flour</i> <i>Sugar or salt</i> <i>Water</i>	Prepare thick porridge. Cool until lukewarm. Add power flour while stirring until you get smooth watery consistency. Boil the mixture for few minutes. Add sugar or salt to taste.	Improves digestion and absorption of nutrients. Energy rich food

Porridge of baobab fruit	<i>1 Baobab fruit, 2 cups water or milk Sugar</i>	Break the fruit. Sieve to separate the powder from the seeds and threads. Mix powder with water or milk, boil and simmer for 20 minutes. Add sugar to taste.	Good for cold and flu. It is a Good appetizer.
Potato soup	<i>3 medium size potatoes, 1 large carrot 1 tablespoon maize flour A pinch of salt 3 cups water</i>	Peel and cut potatoes and carrots in small pieces and boil in water with salt. Cook slowly until very soft. If your soup turns out too thin; mix 1 spoon of maize flour with little water. Add to the soup and heat while stirring till boiling.	Good for weight gain, sore throat and appetizer
Pumpkin stew	<i>½ medium size pumpkin 1/2 kg beef preferably with bones Salt</i>	Cut beef in small pieces and boil until tender. Add chopped pumpkin. Cook slowly until very soft. Add salt to taste.	Helps in relieving diarrhoea.
Rice or millet water	<i>1 cup rice or millet 4 cups water</i>	Boil rice or millet in water till half done. Strain off the excess water and drink.	This is good for diarrhoea and fever.
Rice porridge	<i>1 cup rice A pinch of salt A pinch of ground cinnamon 3 cups water Sugar</i>	Boil rice in water. Add a little salt; Cook slowly for one hour. Add sugar and cinnamon to taste when serving.	This is good for diarrhoea.
Rice soup	<i>1 cup rice 5 cup water 1 clove garlic 1 teaspoon ground cinnamon Salt</i>	Boil rice. Add garlic, cinnamon and salt to taste. Cover the pot and cook slowly till tender. You can also add grated carrot or pumpkin.	Good for diarrhoea and other digestive problems
Sour cabbage water	<i>1 cup chopped raw cabbage 3 cups water</i>	Wash cabbage and soak in water. Cover tightly and leave for 2-3 days. Strain the water from cabbage, throw the cabbage away and store the water in a cool place or refrigerator. It is ready for drinking when it starts to bubble.	Drink ½ a cup after every 8 hours for all digestive problems.

Sour water	<i>1 cup any grain such as millet or sorghum 3 cups water</i>	Any grain can be used. Sprouted grains are the best. Wash and soak millet or sorghum in water. Cover tightly and leave for 2 – 3 days. Strain the water from the grain. Store the sour water in a cool place or in the refrigerator. The sour water is ready for drinking when it starts to form bubbles.	Drink ½ a cup after every 8 hours. It is good for diarrhoea, thrush, weight gain and peptic ulcers. It can also be taken for 2 weeks after taking antibiotics to replace friendly flora.
Togwa	<i>1 cup flour maize or cassava 1 cup power flour 5 litres water</i>	Prepare thick maize or cassava porridge. Cool slightly until lukewarm. Add power flour and mix until the porridge turns watery. Cover and leave overnight.	Drink within one day Improves digestion and absorption of nutrients .

Annex II: Reference table for Body Mass Index (BMI)

BMI						
	< 18.5 Thinness	18.5 - <25 Normal		25 - ≤ 30 Overweight		>30 Obesity
Height (cm)	Body weight (kg)					
	<	≥	<	≥	<	+
146	42.6	42.6	53.3	53.3	63.9	63.9
147	43.2	43.2	54.0	54.0	64.8	64.8
148	43.8	43.8	54.8	54.8	65.7	65.7
149	44.4	44.4	55.5	55.5	66.6	66.6
150	45.0	45.0	56.3	56.3	67.5	67.5
151	45.6	45.6	57.0	57.0	68.4	68.4
152	46.2	46.2	57.8	57.8	69.3	69.3
153	46.8	46.8	58.5	58.5	70.2	70.2
154	47.4	47.4	59.3	59.3	71.1	71.1
155	48.1	48.1	60.1	60.1	72.1	72.1
156	48.7	48.7	60.8	60.8	73.0	73.0
157	49.3	49.3	61.6	61.6	73.9	73.9
158	49.9	49.9	62.4	62.4	74.9	74.9
159	50.6	50.6	63.2	63.2	75.8	75.8
160	51.2	51.2	64.0	64.0	76.8	76.8
161	51.8	51.8	64.8	64.8	77.8	77.8
162	52.5	52.5	65.6	65.6	78.7	78.7
163	53.1	53.1	66.4	66.4	79.7	79.7
164	53.8	53.8	67.2	67.2	80.7	80.7
165	54.5	54.5	68.1	68.1	81.7	81.7
166	55.1	55.1	68.9	68.9	82.7	82.7
167	55.8	55.8	69.7	69.7	83.7	83.7
168	56.4	56.4	70.6	70.6	84.7	84.7
169	57.1	57.1	71.4	71.4	85.7	85.7
170	57.8	57.8	72.3	72.3	86.7	86.7
171	58.5	58.8	73.1	73.1	87.8	87.8
172	59.2	59.2	74.0	74.0	88.8	88.8
173	59.9	59.9	74.8	74.8	89.8	89.8
174	60.6	60.6	75.7	75.7	90.8	90.8
175	61.3	61.3	76.6	76.6	91.9	91.9
176	62.0	62.0	77.4	77.4	92.9	92.9
177	62.7	62.7	78.3	78.3	94.0	94.0
178	63.4	63.4	79.2	79.2	95.0	95.0
179	64.1	64.1	80.1	80.1	96.1	96.1
180	64.8	64.8	81.0	81.0	97.2	97.2
181	65.5	65.5	81.9	81.9	98.3	98.3
182	66.2	66.2	82.8	82.8	99.4	99.4
183	67.0	67.0	83.7	83.7	100.5	100.5
184	67.7	67.7	84.6	84.6	101.6	101.6
185	68.5	68.5	85.6	85.6	102.7	102.7
186	69.2	69.2	86.5	86.5	103.8	103.8
187	69.9	69.9	87.4	87.4	104.9	104.9
188	70.7	70.7	88.4	88.4	106.0	106.0

Adapted from WHO Technical Report series 854.

Annex III: Glossary

AIDS (Acquired Immunodeficiency Syndrome): is a result of infection with HIV, which eventually destroys the body's natural defence system against infection. It is the last and most severe stage of the clinical spectrum of HIV-related diseases.

Antioxidants: these are molecules, which can either be nutrients or enzymes and sometimes both, which mop up damaging free radicals in our bodies.

Calorie: a measure of energy content in foods.

Complementary feeding: is giving a baby other liquids or foods in addition to breastmilk or infant formula after 6 months of age.

Complementary foods: foods or liquids whether manufactured or locally prepared, given to a baby in addition to breastmilk or infant formula after 6 months to satisfy their nutritional requirements.

Dietary fibres: the non-digestible carbohydrates and lignin found intact in plants. It facilitates the emptying of the bowel.

Enzymes: these are chemical substances proteins in nature found in the body that speed up the rate of chemical reactions but are not altered in the process.

Exclusive breastfeeding: means giving a baby no other food or drink not even water (with the exception of medicines and vitamin or mineral drops prescribed by doctor; expressed breastmilk is also permitted), apart from breastmilk.

Fermented foods: these are foods that have been subjected to processing involving the action of yeasts or bacteria.

Germinated foods: these are foods made from seeds that have started to sprout for example *kimea*.

Health diet: a diet with appropriate types and adequate amounts of foods and drinks to supply nutrient for maintenance of body cells, tissues, and organs, and to support normal growth and development.

Healthy eating: is described as eating patterns which involves **variety** of culturally acceptable foods, balanced by a **moderation** intake of each food from all food groups to provide sufficient nutrients that are required for growth, development, physical activity as well as for the maintenance and restoration of health.

Healthy lifestyle: is a way an individual or a community, practices good social, physical, mental, spiritual health, and in harmony with internal and external environment.

HIV (Human Immunodeficiency Virus): a retrovirus that infects human cells and uses nutrients and energy within the cells to grow and multiply and thus damaging the human immune system.

Lactation: the process of synthesizing and secreting breastmilk.

Malnutrition: a condition caused by excessive or deficiency of one or more nutrients in the body.

Metabolism: is a chemical process within cells whereby energy is produced enabling the body to maintain life.

Mother-to-Child Transmission (MTCT): transmission of HIV from mother to her child during pregnancy; at the time of labour and birth or through breastfeeding.

Nutrients: are substances found in foods that provide energy, enhance growth, help repair body tissues and regulate body functions.

Nutrition: the way our bodies take in and use food.

Nutrition counselling: a process of dialogue and mutual interaction aimed at facilitating problem solving, understanding motivation and decision making.

Nutrition education: experiences of individuals, families, groups or communities that influence knowledge, attitudes and practices so as to bring about the desired nutritional behavioural change.

Nutritional supplements: these are products taken in by mouth and contain dietary ingredients, which may include vitamins, minerals, herbs, or amino acids, as well as other substances such as enzymes, organ tissues, metabolites, extracts or concentrates.

Replacement feeding: the process of feeding a child who is not receiving any breastmilk with a diet that provides all the nutrients the child needs until the child is fully fed on family foods.

ISBN 9976-910-40-1

Tanzania Food and Nutrition Centre
22 Ocean Road
P.O. Box 977
Dar es Salaam
Tanzania

Tel: (255) 022 2118137/9
Fax: (255) 022 2116713
Email: tfnc@muchs.ac.tz