



GLOBAL AIDS PARTNERSHIP

HIV/AIDS
Introduction
to Nutrition

Introduction to Nutrition

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CHAPTER 1

Introduction



Key Points

- The church is called to respond to the HIV crisis.
- Nutritional education can be a wonderful way for the church to reach out to the community.
- Adults learn differently than children. Their learning styles and involvement should be taken into consideration when teaching.
- Many aspects of this book can be used to teach about nutrition to a community or church group.

Purpose

This chapter will equip people to pass on information about good nutrition to others by providing teaching ideas and resources.

Using This Manual

This manual is designed as a guide for people with HIV and those working with HIV-positive people. It offers suggestions based on research and recommendations from groups such as the World Health Organization (WHO), the United Nations AIDS Council (UNAIDS), and the Centers for Disease Control (CDC). However, they are simply guidelines and will need to be adapted to individual situations or regions.

Not all foods mentioned in this unit are available in every region of the world. You will have to investigate to discover what foods can be found in your area. Ask your friends and neighbors. Request information from local non-governmental organizations. National botany societies or university professors may be able to provide additional information.

Note on use of pronouns: Throughout this manual, the masculine pronouns him/his/he are used in situations that could be applied to both men and women.

How a Church Can Use Nutrition To Reach Out To Those With HIV

Questions for Discussion



- What is the church's role in responding to HIV?
- What can your church or community do to help people with HIV obtain nutritious food and clean water?



Activity

Read Matthew 25:35–40 as a group. Ask:

- What does this passage tell us about how God views physical needs?
- According to this passage, how should Christians respond when they see someone who is hungry or thirsty?

Once when Jesus was talking to the disciples, He told them a story about those who serve God and those who served themselves. In Matthew 25:35–40, Jesus told His followers,

Then the King will say to those on his right, “Come, you who are blessed by my Father; take your inheritance, the kingdom prepared for you since the creation of the world. For I was hungry and you gave me something to eat, I was thirsty and you gave me something to drink, I was a stranger and you invited me in, I needed clothes and you clothed me, I was sick and you looked after me, I was in prison and you came to visit me.”

Then the righteous will answer him, “Lord, when did we see you hungry and feed you, or thirsty and give you something to drink? When did we see you a stranger and invite you in, or needing clothes and clothe you? When did we see you sick or in prison and go to visit you?”

The King will reply, “Truly I tell you, whatever you did for one of the least of these brothers and sisters of mine, you did for me.”

Every church is different. The physical needs in each church and community are unique, and each church can offer unique resources.

Jesus emphasizes the importance of serving others not just in spiritual matters but also in physical matters. Jesus did not say, “I was hungry and thirsty, and you preached to Me.” He said, “I was hungry and thirsty, and you gave Me food and water.” People had physical needs, and Jesus expected His followers to respond as His representatives to the needy with physical help.

Every church is different. The physical needs in each church and community are unique, and each church can offer unique resources.

There are many ways that a church can use nutritional help to reach out to those affected by HIV. Some suggestions include:

- **Food offerings.** Offerings or gifts do not have to be monetary. A church can collect an offering of food to be given to those dealing with HIV/AIDS.

- **Food bank.** A food bank or pantry is a collection of food that can be distributed to people in need. This food can be bought with money given by church members or stocked from food donated by members.
- **Meal delivery.** When people are sick with AIDS, they may not have strength to prepare food for their families. Members of the church can arrange a meal service and take turns preparing and delivering nutritious meals to families affected by AIDS.
- **Household help.** Someone weak from AIDS may be unable to perform daily activities like food preparation or cleanup. Members of the church can visit these families on a regular basis to help with household chores.
- **Community garden.** If an individual family does not have space for a garden or is unable to manage a garden, families in the church can come together and care for a community garden. Members of the group take turns caring for the garden, and the harvest is distributed among the families.
- **Teach classes on nutrition, gardening, or cleaning water.** Short classes in the evening or on weekends are great ways to pass on information about nutrition and other related subjects. They also serve to introduce people who would not normally come into a church to a church and its members.

Adult Learners

People learn through different methodologies.



Questions for Discussions

- How are adults different than children?
- How do adults learn new information?
- How do adults learn differently than children?

There is a Chinese saying that states, “Tell me, and I’ll forget. Show me and I may remember. Involve me, and I’ll learn.” This means that for most people, simply telling them information does not mean they will remember it or do anything with it.

People learn through different methodologies. Participating in an activity or seeing a demonstration helps people remember better than just listening to someone talk. This is especially true of adults.

Teaching adults requires creativity. Adults need to be included in the teaching process by discussion questions, activities, and role-plays. Adults already have knowledge about the topic from life experience. This knowledge must be respected.

Teaching Using This Unit

Role-Plays

Role-plays are found throughout the book. They help demonstrate key concepts and initiate discussion. If using this manual to teach a group, invite members of the group to act out the role-plays. After the role-play, ask questions of the group to invite discussion of the topic.

Questions for Discussions

These questions encourage critical thinking about the topic. Take time to discuss these questions with a group. If you are alone as you study this unit, take time to think about the questions. There are no right or wrong answers; they are simply intended to make you think about the topic being addressed.

Activities

Activities can be done in a small group. They help to clarify the concepts discussed in the unit. They require only a few supplies. Being involved in an activity rather than just reading about something makes it easier to understand and remember the concepts.

Goals of the Book

Readers will know:

- That a healthy diet consists of foods that provide for energy needs and includes proteins, carbohydrates, fats, and micronutrients.
- The specific nutritional needs and concerns associated with HIV/AIDS.
- The risks associated with improperly prepared, contaminated foods and the importance of clean water, food, and eating utensils.

In addition, readers will be able to:

- Plan a healthy diet using available foods and resources.
- Prepare nutritious foods and provide safe water.
- Treat and prevent major AIDS complications associated with nutrition.
- Take steps towards food security through low impact/high yield gardening.
- Pass the information they have learned to others.

CHAPTER 2

Background of HIV and Nutrition



Key Points

- HIV is a virus that causes the disease AIDS. There is no cure for AIDS, but people with HIV can do things to live longer, healthier lives.
- HIV is spread through blood, sexual fluids, and breast milk. It cannot be spread through casual contact like hugging or shaking hands.
- HIV attacks the part of the body responsible for fighting disease: the immune system.
- Many things make the immune system stronger or weaker, but one of the most important things is the food a person eats.

Purpose

This chapter will introduce the relationship between HIV/AIDS and nutrition and provide basic information about HIV/AIDS.



Questions for Discussion

- What comes to mind when you think of AIDS?
- What do you think of when you think of a person who has AIDS?

Background of HIV/AIDS

The HIV/AIDS epidemic was first identified in the early 1980s in the United States. Since then it has affected every region of the world. Millions of people have died from the disease; millions more are currently living with it. Africa is the most-affected region, with some African nations having infections rates greater than 25 percent: 1 out of 4 adults in those countries is infected (UNAIDS Global Facts and Figures).

In places like Africa, AIDS affects all types of people. It is generally spread through sexual contact between men and women or from an infected mother to her baby. In other parts of the world, the epidemic has mostly been contained within certain groups of people such as homosexual males or intravenous drug users.

Governments and civil groups have made great efforts to stop the spread of HIV/AIDS. In many parts of the world, these efforts combined with personal choices to abstain from sex before marriage and be faithful in marriage have reduced the numbers of new HIV cases. However, in other parts of the world the numbers of new cases are still growing.

Information about HIV/AIDS



Questions for Discussion

- What is the most common way for people in your country or community to contract HIV?
- What factors in your local community or the culture of your country impact the spread of HIV?
- Are there practices in your culture that discourage the spread of HIV? (For example, is faithfulness in marriage important for both men and women? Are young people encouraged to wait until they are older to become sexually active?)
- Are there practices in your culture that facilitate the spread of HIV? (For example, do people have easy access to illegal drugs? Is it acceptable for men to have multiple sexual partners?)

HIV stands for Human Immunodeficiency Virus. It is a tiny germ that can invade a person's body and attack the parts of the body (called cells) that fight off sickness and help the body heal from injuries.

Normally, when a person becomes sick, the immune system defends a person's body from the illness and the person gets better. One of the most important parts of the immune system are the T-cells (also called CD4 cells), which help protect the body from disease.

The immune system acts somewhat like an army defending a country. As long as the army is stronger than the attackers, the country is safe. For a human, as long as the immune system is strong, it can fight off the disease germs trying to make that person sick.

HIV stands for Human Immunodeficiency Virus. This is a tiny germ that can invade a person's body and attack the parts of the body (called cells) that fight off sickness and help the body heal from injuries.

HIV is a germ that attacks these T-cells that are so important for the immune system. When a person's immune system is weak because HIV is attacking it, other diseases such as tuberculosis (TB) and pneumonia are able to enter a person's body and make the person sick. When a person's immune system is so weak that he is not able to fight off these other infections, called opportunistic infections, the person is said to have AIDS (Acquired Immunodeficiency Syndrome). It can take many years after HIV enters the body for the person to develop AIDS.

Right now, there is no cure for HIV. Once a person tests positive for having the virus in his body, he will have it his entire life. Without certain medications called antiretrovirals (ARV), the HIV will weaken the person's immune system and he will develop AIDS and die. This process can take many years, but normally takes between two to ten years.

The good news is that while there is no way to cure HIV, there are ways to treat it, so that a person does not develop AIDS as quickly. This treatment is called antiretroviral therapy (ART). These are a group of medications that decreases (not eliminates) the amount of HIV in the body so the person is not as sick. People who are taking ART are able to live healthy, long lives. Unfortunately, ART is not available everywhere in the world, and in some places it is too expensive for most people to be able to afford it.

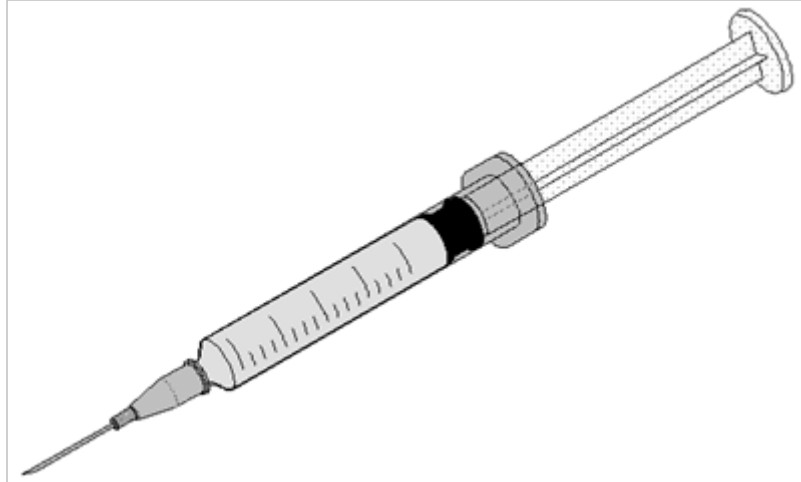
The good news about HIV is that it is not easily spread. There are only three ways it can get into a person's body: breast milk, blood, and sexual fluids.

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The first means of transmission is through breast milk from a mother to child. If a mother is HIV positive and breastfeeds her baby, it is possible for the baby to get HIV from the milk. If a woman who is HIV positive has a baby, there are several options she can take to keep her baby from getting HIV. She can give her baby a milk substitute such as formula (made with clean water), but this can be expensive. The World Health Organization (WHO) recommends that a mother nurse her baby exclusively for six months. Then she should gradually wean the baby off breast milk so the baby is not taking breast milk at all by the time he is a year old.

The second way to get HIV is from blood. If an HIV-positive person's blood enters another person's body, that person can get HIV as well. This can happen in many ways. The most common way for this to happen is among people who inject drugs into their bodies. A needle that people use to inject drugs can trap a person's blood inside it, so that the next person who uses the needle is exposed to the first person's blood. Blood can also carry HIV to another person if a medical or dental facility reuses needles or other medical equipment without properly cleaning them or if a person uses some kind of sharp object (like a razor) that has another person's blood on it.

To prevent the spread of HIV through blood, people should not share needles. In most parts of the world, a person can buy his own needle and ask the doctor to use that if he does not think the medical equipment is being cleaned properly. A person should cover his hands with something like gloves or a plastic bag before touching someone else's blood.



The most common way a person gets HIV is through unprotected sex with someone infected with HIV. Any kind of sexual activity outside of a monogamous relationship (one man with one woman for life) can spread HIV, but some kinds of sexual practices such as anal sex, rough sex, or dry sex can spread HIV more easily. The more partners a person has sex with and the more times they have sex, the greater the chance that he can become infected with HIV, but a person can become infected after just one unprotected sexual encounter.

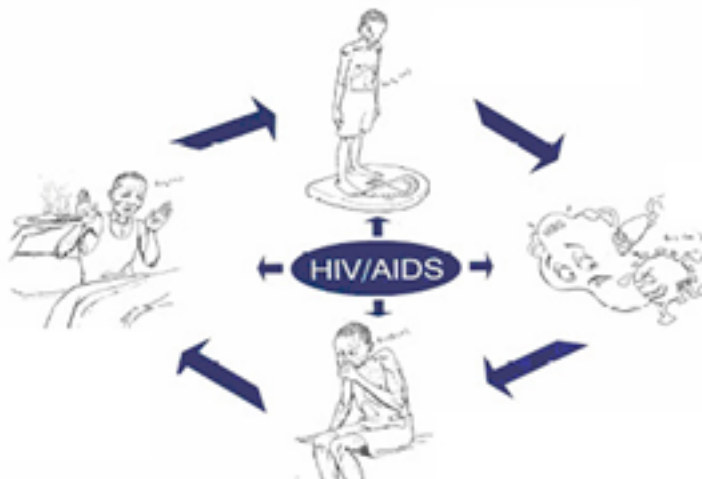
In most of the world, people having sex with partners of the opposite sex (men having sex with women and women having sex with men) are the largest spreaders of HIV. In some parts of the world, however, people who have sex with partners of the same sex (men with men, for example) account for a large percentage of HIV infections.

Using a latex condom when having sexual intercourse can reduce a person's chances of getting HIV, but it cannot eliminate the risk completely. The only way to eliminate the risk of getting HIV is to abstain from sex before marriage and for both partners within marriage to be completely faithful to each other.

There are many ways that HIV is not spread. HIV is not spread from skin to skin, so a person cannot get it from hugging, kissing, or shaking hands with a person who has HIV. A person cannot get HIV from using utensils or toilets or beds or blankets of a person with HIV. People with HIV can live and work alongside other people without infecting them.

Relationship Between Nutrition and HIV

The immune system protects a person from diseases. A person's overall health affects the way the immune system protects the body. The immune system is complex, with many different things making it stronger or weaker. Food plays an important role in the strength of the immune system. A person who gets enough good, clean, healthy food will have a healthier immune system than someone who does not.



The immune system protects a person from diseases. A person's overall health affects the way the immune system protects the body.

For someone who has HIV, it is essential to take measures to help maintain a healthy immune system. HIV is constantly attacking the immune system, slowly destroying it. This allows other diseases to infect the body. Eating healthy, nutritious foods strengthens the immune system of a person with HIV and helps him stay healthy longer.

When a person is infected with HIV, the body requires more energy to stay healthy. Food provides the energy required to perform daily activities like walking, housekeeping, and working. People with HIV require more food and energy than uninfected people because HIV forces the body to work harder.

Sometimes people with AIDS lose their desire to eat. They may not feel well because of their infections or they might be tired from the effect HIV has on their bodies. ART medications can cause a loss of appetite, so the person does not feel hungry even if his body needs food. Depression can also cause a loss of appetite. Someone with HIV needs to know what kinds of foods to eat and understand why it is important to eat them.

CHAPTER 3

Introduction to Nutrition



Key Points

- Food provides the body with energy needed to work, move, and fight infection.
- There are several major types of food. A person should eat some of each.
- The three major types of foods are staples, body-building foods, and high-energy foods.
- Staple foods are things like grains, corns, and rice. They give the body energy. About 40 percent of a person's diet should be staple foods.
- Body-building foods are used by the body to repair and strengthen the body. These are meats, some beans and nuts, eggs, milk, and foods made from milk like yogurt and cheese. A person should eat body-building foods at least once a day.
- High-energy foods include animal fat, butter, lard, and sugar. They are good to eat if a person is trying to gain or maintain weight.
- People need other nutrients called vitamins and minerals. They are found in foods like fruits and vegetables.
- In addition to clean, healthy food, a person needs to drink at least 8 cups of clean or purified water every day.

Purpose

This section will introduce the basics of nutrition and the body's nutritional needs.



Questions for Discussion

- What kinds of foods do you and people in your community eat?
- What is a typical meal like? Do people eat alone or together as a family or group?

Nutrition is the study of the types of foods a person needs, how the body benefits from these foods, and what foods are not good for the body. Everyone needs to know about nutrition, not just people with HIV. Everyone should eat a good diet composed of nutritious foods. The more people know about nutritious foods, the more they can make smart choices about the foods they chose to eat.

This section introduces some basic guidelines on good nutrition. These are not just limited to people who are HIV-positive, but are true for everyone.

Energy Needs

Food provides the energy the body requires to function. As an example, consider an automobile. It has wheels, an engine, doors, pedals, etc., but it can't work without gasoline in the tank. Food for humans is like gasoline for cars. Humans must have food for their bodies to function.

Different types of foods contain different amounts of energy. For example, a cup of thin broth and a cup of milk have the same quantity of fluid, but the cup of milk has much more energy than the cup of broth.

Nutritionists (people who study nutrition) use either the term calorie or kilojoule, depending on which part of the world they work in, to measure the amount of energy in foods. A nutritionist would say that a food containing a lot of energy is high in kilojoules; a food without much energy is low in kilojoules.

Different people need different amounts of energy, depending on how their bodies function and what kind of labor they do. Someone who does a lot of physical labor, like farming or construction, will need more energy (and, therefore, more food) than someone who sits in an office or drives a bus or taxi. Generally, men need more food than women—which is why men normally eat more than women. Sometimes, an illness like HIV can increase the body's energy needs.

Different people need different amounts of energy, depending on how their bodies function and what kind of labor they do.

If someone is healthy, feeling hungry indicates that the person needs to eat food. Generally, people should eat when they feel hungry and stop when they are full (or no longer feel like they are hungry). However, if someone is sick, he might not feel hungry even though his body needs energy. He should still eat nutritious food.

If a person eats more than he needs, the body will convert the extra food into a substance called fat and store it in the body. Everyone needs some fat in his body. If someone goes without eating for a period of time, the body will use the stored fat for energy. Fat also helps protect a person by “padding” his body and helping him stay warm in cold weather. However, too much fat is not good; it can lead to problems such as heart disease and diabetes. When a person has too much extra fat, he is considered overweight or obese.

If a person does not eat a sufficient quantity of food over a long period of time, his body will start to use the stored energy (fat), and he will lose weight. The person may become underweight or malnourished if he does not increase the

amount of food he eats. People who are malnourished are at a greater risk for developing infections such as diarrheal diseases.

Diarrhea and vomiting can cause malnutrition, even if a person is eating enough food. When a person vomits, the food leaves the body instead of being digested and used as energy. Diarrhea causes the food to move through the body so quickly it does not have enough time to be absorbed and used as energy. Worms cause malnutrition because they eat the food a person swallows and then use it for their own energy, instead of allowing the body to absorb it.

In most of the world, being underweight is a greater concern for most people than being overweight. If people in poverty cannot buy nutritious food, they eat what they can afford, which may not always provide all their nutritional needs. People can be taught to prepare inexpensive yet healthy foods and how to grow their own food. (For more information, see the appendices.)

Types of Foods

Though all foods provide some energy, different types of foods have different attributes. There are three main categories of foods: staples, body-building food, and high-energy food. A person needs all three of these for a healthy diet.

Staples: Carbohydrates

Staple foods, also called carbohydrates, are grains such as bread, corn, rice, and some vegetables, like potatoes and yams. They are often called starchy foods. Staples have high numbers of calories and are easy for the body to use as energy.

Staple foods, also called carbohydrates, are grains such as bread, corn, rice, and some vegetables, like potatoes and yams. They are often called starchy foods.

About 40 percent of a person's daily food intake should be staple foods (World Health Organization 2002). If possible, a staple should be eaten with each meal. In addition to providing energy, staples help a person's stomach feel full. However, starches do not provide all the nutrients a person needs to be healthy. Other foods are necessary for a balanced, nutritious diet.

Sugars and other sweets are also carbohydrates, but should be eaten in small amounts. Processed staples such as white flour and white rice should be eaten in moderation. Whole grains such as brown rice and wheat or rye bread are healthier choices.

Activity

Make a list of staple foods that you eat or have access to in your community. If you have a piece of paper, write down these ideas as people come up with them. There are lists of some staples, body-building foods, and high-energy foods in the appendices at the end of this unit. You may have some in your area that are not on this list. Go back through your list and mark the foods that can be grown or bought cheaply in your area.

Body-Building Foods: Proteins

Body-building foods provide some energy and the building-block materials the body needs to repair itself and grow. These foods help to build bones, muscles, and the cells of the immune system. Another name for body-building foods is protein. Protein is found in foods like meat, fish, beans, soybeans, nuts, peanuts, milk and yogurt, and edible insects.

Body-building foods provide some energy and the building-block materials the body needs to repair itself and grow.

Body-building foods are usually more expensive than staples and high-energy foods. They are often the most difficult type of food for people to eat on a daily basis, especially in resource-poor areas. Some proteins, such as meat and milk products, spoil easily without proper refrigeration. However, a person does not have to eat expensive proteins to be healthy. In most parts of the world, cheaper options such as beans, nuts, and peanut butter are readily available, and they provide good protein for the body. WHO recommends that a person eat at least one protein every day and try to eat meat or fish once or twice a week.

Activity

Make a list of body-building foods that you eat or have access to in your community. If you have a piece of paper, write these down as people come up with them. Be creative. In the appendices there are lists of some staples, body-building foods, and high energy foods. You may have some in your area that are not on this list. Go back through your list and mark the ones that can be grown or bought cheaply.

High-Energy Foods: Fats

The body uses fat to store extra energy. Fats are a type of food that contains a lot of energy. It takes longer for a person's body to use fats than carbohydrates or protein. Because of this, fats are considered high-energy foods. Pure fats include butter, palm and coconut oil, vegetable oil, lard (the grease from animal fat), and olive oil.

Some foods are a combination of all three nutritional categories: staple, body-building food, and high-energy food. For example, peanut butter is a body-building food, but it also contains a significant amount of energy. Many body-building foods also contain fat, such as red meat, nuts and seeds, and milk and yogurt.

Normally, people only need small amounts of high-energy, fatty foods in their daily diet. Many high-energy foods, like oils and lard, are used in cooking. The fats used in cooking normally supply all the body-building foods a person needs. However, if a person is trying to gain weight, he should eat more high-energy food.

Activity

Make a list of high-energy foods that you eat or have access to in your community. If you have a piece of paper, write these down as people come up with them. Be creative. In the appendices there are lists of some carbohydrates, proteins, and fats. You may have some in your area that are not on this list. Go back through your list and mark the ones that can be grown or bought cheaply.

Eating a Balanced Diet

A person needs staples, body-building foods, and high-energy foods on a daily basis. One type of food cannot provide all the necessary nutrients. Without the right nutrients, the body cannot grow or function properly. A person has a greater risk of getting sick without good nutrition.

A person needs staples, body-building foods, and high-energy foods on a daily basis.

WHO recommends that a person eat at least one starchy food with every meal. The body also needs at least one body-building food every day, including meat once or twice a week. A person only needs a small amount of high-energy food each day. What is used in cooking and found in body-building foods is usually sufficient. It is not necessary to eat additional fatty foods or sweet foods unless a person is trying to gain weight.

Micronutrients (Vitamins and Minerals)

The terms staples, high-energy foods, and body-building foods cover three large categories of foods. All foods fall into one of these categories, and some belong to more than one category. Some foods also have other important nutrients. These other nutrients are called vitamins and minerals.

People need dozens of different vitamins and minerals to stay healthy. However, only a small quantity of each vitamin or mineral is needed every day. For example, salt (or sodium) is a mineral that helps the body use energy from foods, and it also

controls fluids in the body. Salt is frequently used to season foods. Normally, the small amount of salt used for cooking and seasoning is sufficient.

Large amounts of vitamins or minerals are normally not good for the body. For example, too much salt over a long period of time can lead to problems like diabetes and high blood pressure.

Many vitamins and minerals are found in fruits and vegetables. For example, yellow, orange, red, or dark green vegetables and fruits contain a large amount of vitamin A, which is important to fight infection and build new cells.

Major Vitamins and Minerals

Name	What it does in the body	Where to find it
Vitamin A	Protects the digestive system. Decreases risk of diarrhea and other stomach illnesses. Fights infection and builds new cells.	Spinach, pumpkin, cassava leaves, peppers, squash, carrots, amaranth, peaches, apricots, papayas, mangoes, sweet potatoes, and maize.
Vitamin C	Helps the body fight infection and recover from being sick.	Citrus fruits such as oranges, lemons, grapefruit, and guavas, mangoes, tomatoes, and potatoes.
Vitamin E	Protects cells and fights infection.	Green leafy vegetables, vegetable oils, peanuts, and eggs.
Vitamin B-group	Keeps the immune and nervous systems healthy.	White beans, potatoes, meat, fish, chicken, watermelon, maize, grains, nuts, broccoli, and avocados.
Iron	Protects against anemia (a shortage of red blood cells, which is common among women and children).	Green leafy vegetables, seeds, whole grains, maize, millet, dried fruit, beans, red meat, chicken, fish and other seafood, and eggs.
Selenium	Keeps immune system healthy.	Whole grains, maize, millet, milk products like cheese and yogurt, meat, fish, chicken, eggs, peanut butter, and nuts.
Zinc	Keeps immune system healthy and increases appetite.	Meat, fish, chicken and other bird meat, whole grains, maize, beans, peanuts, and milk and milk products.

Water



Questions for Discussion

- Where does the water your family drinks come from?
- Do you think that water causes diseases in people in your community? Why or why not?
- What diseases are caused by drinking dirty water in your area?

Water does not contain nutrients, but it is vital for life. The body cannot function for long periods of time without water. Everyone needs to drink sufficient quantities of clean or purified water, or other liquids like juice or tea, every day.

Most adults need to drink at least 8 cups of water a day (World Health Organization 2002). When someone works outside or is involved in physical labor, he sweats and the body quickly loses water. He needs to drink more water, enough to replace what the body has lost through sweating.

Some fluids also contain nutrition, such as milk and juice. Drinking these fluids replaces liquids lost through sweating and adds extra nutrients at the same time.

While it is important to get enough food and water, they must also be clean and safe. Germs that make people sick live in spoiled or unwashed foods, causing diarrhea, vomiting, fever, worms and, in some cases, death. Dirty water is one of the major causes of deadly diseases such as cholera, typhoid, and intestinal worms. In Chapter 5 and the appendices, there are suggestions for how to make sure food and water is clean and safe before consuming it.

Serving Sizes

Nutritionists recommend that a person have a certain amount of each kind of food each week or day. This is called the serving size. Serving sizes vary depending on the type of food and region of the world.

For example, nutritionists say that people should try to eat at least one serving of body-building food each day. In most regions of the world, this is a handful of beans or a large spoonful of peanut butter or 3–4 ounces of meat (a piece of meat about the size of the palm of a hand).

Below are examples of serving sizes of various foods. Not all foods are listed here, but these are examples of how much a serving size is for many kinds of food.

Food	Serving Size
Medium-sized fruit like apples, bananas, and oranges	1 piece of fruit
Meats, fish, and chicken	3–4 ounces, the size of the palm of a hand
Beans, rice, vegetables, and cornmeal mush	½ cup or a large handful
Bread	1 slice
Flat breads like tortillas and pita bread	1 piece of bread
Peanut butter, cheese, cream, and humus	1 large spoonful
Milk, juice, coffee, tea	1 cupful

CHAPTER 4

Special Nutritional Needs of Those With HIV



Key Points

- People with HIV need the same healthy foods and clean water that people without HIV need. In addition, people who are HIV positive have special nutritional needs.
- People with HIV need more food than those without it, but they may have less of an appetite.
- People with HIV are especially vulnerable to infections, so their food, water, and eating utensils must be clean.
- Eating foods that help fight infection will help strengthen the immune system, so people with HIV can stay healthier longer.
- HIV and ARTs change how the body reacts to certain foods such as milk products or spicy foods.
- In resource-poor settings, people with HIV are at a high risk for food insecurity.

Purpose

This chapter will explain why nutrition is important to those with HIV/AIDS and what specific nutritional needs people with HIV/AIDS have.



Questions for Discussion

- Do you think people with HIV need the same kinds of foods as everyone else?
- What special foods might they need?
- What factors affect the ability of a person with HIV to get the food he needs?

Increased Energy Needs

HIV affects many systems in the body, but a person with HIV is not always aware of them. One change is in how the body uses food. The immune system uses extra energy to fight against HIV and opportunistic infections. As a result, people with HIV need more food than people without the virus—even when there are no symptoms of sickness.

The World Health Organization says that people with HIV need about 10 percent more food than someone who is not infected (World Health Organization 2003). For example, if a person ate ten pieces of bread before he became infected with HIV, he would need to eat eleven after he became infected.

Wasting Syndrome

One common symptom of advanced HIV infection is called AIDS wasting syndrome. This is when people with HIV steadily lose weight over a period of time—usually six to seven kilos, or 10 pounds. This weight loss is often one of the first signs of AIDS (Romeyn 1998). This leads to fatigue and physical weakness. The skin becomes worn and wrinkled, making the person appear older than their actual age.

Eating enough nutritious foods from each of the food groups is one of the best ways to prevent wasting syndrome or to reduce its effects. It does not always prevent wasting completely, but a good diet helps people with HIV stay healthier longer.

Higher Risk of Infection

HIV attacks the immune system, which is needed to fight off infections and diseases. This increases a person's risk of becoming sick with other infections called opportunistic infections. People with HIV have a greater risk of becoming ill from contaminated food, water, or other environmental causes (Mamlin et al. 2009).

HIV attacks the immune system, which is needed to fight off infections and diseases. This increases a person's risk of becoming sick with other infections called opportunistic infections.

People with HIV need foods that help fight infections, such as fruits and vegetables. Certain vitamins found in fruits and vegetables are very effective at fighting infection. Many people with HIV take supplements to make sure they are getting the vitamins what they need. It is also extremely important that the food, water, and utensils of people with HIV are clean and safe to use.

Decreased Appetite

For a number of reasons, people with AIDS often do not have good appetites. They may have mouth sores, nausea, and diarrhea, which make them not want to eat. Certain ARVs decrease a person's appetite. Some foods might not taste as good as they did before they started taking ARVs. Additionally, a person with HIV might feel so tired or sad that they simply have no desire to eat.

But it is important to eat even when a person does not want to; the body still needs nutrients even if a person does not have an appetite. Finding foods that a person with HIV can or will eat takes creativity. Experimenting with different

foods or different spices or flavors may produce something that a person who is not feeling well can eat.

Sensitivity to Foods

Some people with HIV develop sensitivity to certain foods such as milk products, spicy foods, “rough foods” like lettuce and carrots, or foods that are very hot or very cold. Some people have no problems eating any type of food, but others cannot eat many things. The only way to know what someone is sensitive to is to experiment with different foods and then observe if the food makes the person sick. If the foods make the person sick, he will know to avoid those foods in the future.

A common problem for people with HIV is sensitivity to milk and things made from milk such as yogurt and cheese. This is called *lactose intolerance*. Some people are severely lactose intolerant and cannot tolerate anything made from milk or foods that contain milk. Other people are mildly intolerant and can eat cheese or small amounts of yogurt, but not pure milk.

A common problem for people with HIV is sensitivity to milk and things made from milk such as yogurt and cheese. This is called lactose intolerance.

Food Insecurity

Food insecurity describes a situation in which a person does not have clean food readily available to his or her family. This can happen for many reasons. Natural events such as drought, flood, and other disasters cause food insecurity because they destroy crops and stored food. The most common cause of food insecurity is poverty, because people cannot afford to buy the food their families need. Food insecurity leads to hunger, nutrition-related illnesses, and even death.

People with HIV are especially vulnerable to food insecurity (Mamlin et. al. 2009). People with HIV might have difficulty getting or keeping a job because they are sick or because of the stigma against HIV. They may feel too weak to garden and grow the foods that they need. Or they might choose to give their food to other members of their family instead of eating it themselves.

It is important for people with HIV to eat as much nutritious food as they can. If the person is unable to get out of bed to eat, family or friends can eat with him or her at the bedside.

CHAPTER 5

Creating a Healthy Diet



Key Points

- People can take measures to make their diets healthier.
- People should only drink water and eat foods they know are clean.
- A person should eat a variety of different foods to get all the nutrients he or she needs.
- It is important to clean the mouth and teeth regularly.
- There are simple things that people can do to keep their food and water clean and hygienic.
- Preparing and storing food properly is important to prevent disease.

Purpose

This chapter will explain how to choose healthy and safe foods and give examples of healthy diets.



Questions for Discussions

- What foods do people in your community eat often that you think are healthy or good for them?
- What foods do people in your community eat often that you think are unhealthy or bad for their health?

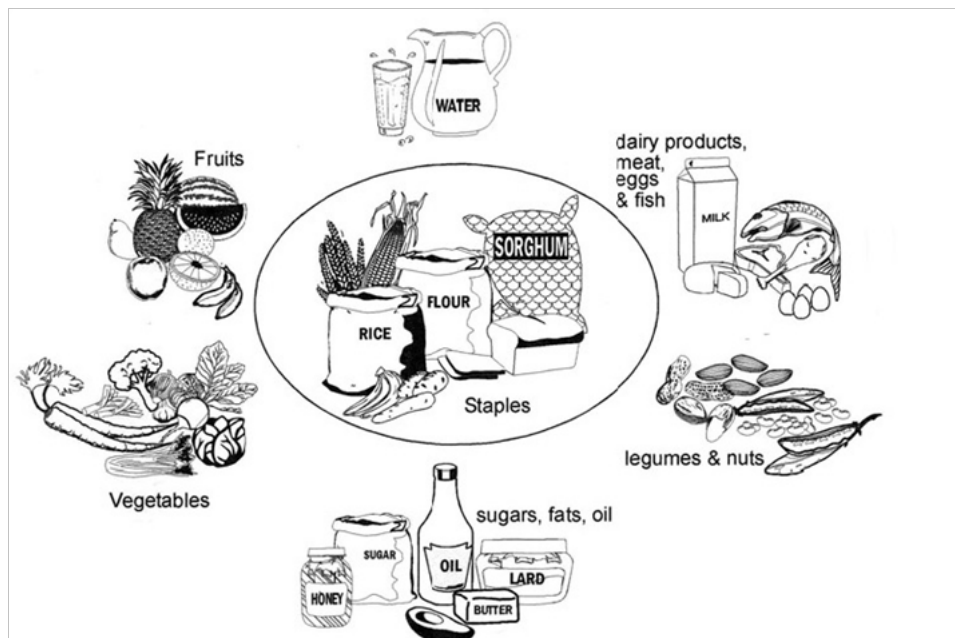
Just knowing about the healthy foods that people should eat does not always mean they will choose to eat them. Many factors influence food choices, such as knowing how to choose healthy foods, how to prepare them, how to keep cooking items clean, and how to store foods so they don't spoil.

Tips to Create a Healthy Diet

- Drink plenty of clean water and other liquids. Water is an irreplaceable part of a healthy diet. Even when someone is sick or not feeling well, he or she still needs to drink. Other liquids such as juices and milk can be drunk instead of water.
- Avoid processed foods such as white sugar, white flour, and white rice. Highly processed foods (for example, white bread, candies, and sodas) contain few nutrients. People often substitute processed foods for healthier choices like brown rice and whole-grain breads. In some parts of the world, brown rice and grains are not available or are too expensive for most people to afford. In these cases, people should eat the healthiest

foods they have available. Additionally, food with a lot of sugar can damage teeth.

- Avoid alcohol, tobacco, and drugs. Alcohol, tobacco, and drugs cause serious damage to a person's health. They also interact with ARVs and complicate infections.
- Eat only clean food and water. Becoming sick from contaminated foods or water is a common problem. Properly cleaning food and purifying water can prevent many of these illnesses.
- Eat a variety of foods. Some people eat the same foods all the time. This happens because of limited food availability, or because people have developed a habit of eating the same food over and over again. Eating one type of food all the time means that a person is only getting the nutrients in that food, and is missing the nutrients found in other foods. Eating a variety of foods is a good way to get all the nutrients a person needs. Listed later in this unit are ways to add more variety to a family's diet without increasing the amount of money spent on food.
- Practice good oral care. Keeping the mouth clean is important to prevent infections and improve the taste of food.
- Exercise such as walking, playing sports, and helping with simple chores helps a person feel more alert, less depressed, and part of the community. A person with AIDS might feel too ill to do physical labor, but it is important to stay active.



How to Add Variety to Your Diet

- Buy or grow different foods. Try to buy or grow foods that are different from what you usually eat. You may be able to combine foods from different categories and still spend about the same amount of money as you normally would. For example, in many parts of the world, beans and nuts are fairly inexpensive and are good sources of energy.
- Learn to preserve foods. Some foods, such as fruits and vegetables, have a season or a time when they are ripe and, therefore, available and less expensive. Buying or harvesting these foods during their season and then preserving them is a good way to keep these foods available all year long. Methods to preserve foods are given in the appendices.
- Grow your own foods. Certain fruits and vegetables can be grown fairly easily and require little soil and labor. Suggestions for how to grow these foods are given in the appendices.
- Share foods. Not all families in the same village or church have access to the same foods. For example, one family might be able to buy several bags of rice at the market. Another family may have an abundant harvest of yams, and the goat of yet another family gives an unusually large amount of milk. Normally, each family would just enjoy having extra rice, yams, or milk. A good alternative for these three families is to share or trade their extra resources, so all the families will have milk, yams, and rice. Everyone contributes their excess garden produce, harvest, milk, etc., in exchange for items that other people also have in excess. It is not a donation, because everyone who takes part must contribute something.

Activity

Stone Soup

There is an old tale about stone soup. An isolated village had been experiencing a drought, and their crops were failing. None of the families had enough food. Two wise old grandmothers told the village that they could feed the whole village a wonderful, nutritious soup.

“No, you can’t,” the villagers said. “You don’t have enough food, either.”

“No,” the grandmothers replied. “We can feed the whole village. We have a special stone.” They held up a large, smooth rock. “And, if we put it in the pot, there will be enough soup to feed everyone.”

The villagers were intrigued by these ideas. “We want to see you do this,” they said.

“Alright,” the grandmothers replied. “But only people who put something in the pot can eat the soup when we are done.”

All the villagers went back to their homes to find something they could put into the pot. The grandmothers filled a large pot with water and placed the stone in the bottom. Slowly, all of the villagers put something in. One family brought potatoes that they cut into small pieces. Another brought onions they had dried from the summer before. Still another brought meat and added it to the pot. On and on, each villager put something in: carrots, peas, tomatoes, and spices. Soon the pot was filled with meat and vegetables. The grandmothers let it cook until it was just right.

They served the soup to each villager. There was plenty for everyone, and it was the best soup any of the villagers had ever tasted.

“What made that stone so special?” the villagers asked the grandmothers.

The grandmothers smiled. “There was nothing special about the stone,” they said. “What was special was that everyone put something in, and it made the best soup we have ever had.”

Activity

Recipes are instructions for preparing foods. Some cultures write recipes down and follow them very closely. Others pass recipes orally, with mothers teaching them to their daughters or other family members. Often families within a community prepare the same food in different ways. With the group, talk about and share some of the recipes your family uses to prepare foods.

Mouth Care

Keeping the mouth and teeth clean and healthy will help prevent mouth sores, as well as gum and tooth infections. Food tastes better when a person’s mouth is clean.

Tips for Oral Care

- Avoid tobacco and alcohol. They can cause teeth and gums to decay, stain teeth, and increase the risk of cancer and mouth sores.
- If an infant or small child receives formula from a bottle, clean and sterilize the bottle in boiling water before using it. Do not give a bottle at bedtime. Teach toddlers to drink out of a cup instead of a bottle.
- Brush teeth and rinse the mouth with clean water and fluoride toothpaste, or a small amount of baking (bicarbonate) soda at least twice a day. If food does not taste good, it might help to rinse the mouth before meals.
- If a toothbrush is not available, brush teeth with a twig that is chewed down as a brush. Sharpen the other end to pick food from between the teeth.
- Drink sugary drinks and eat sweet foods only in small amounts and brush the teeth immediately afterwards.
- Floss daily using dental floss, clean sewing thread, or fishing line.

- If a child is too young to be able to brush or floss their own teeth, a parent or caregiver can do it for them until they are old enough to learn how.

Keeping the mouth and teeth clean and healthy will help prevent mouth sores, as well as gum and tooth infections.

How to Brush Teeth

Using a soft brush and toothpaste or a small amount of baking (bicarbonate) soda, brush all teeth (not just the teeth in the front of the mouth) starting at the base of the teeth near the gums. Thoroughly brush the chewing surface (top) of the teeth, the front side of the teeth, and then the back. Brush the tongue. Rinse the mouth with clean water and rinse the toothbrush with clean water and allow it to air dry.

How to Floss

Wrap about 18 inches (45 cm) of floss around your middle finger. Pinch the floss between thumb and index finger. Gently run floss up and down between teeth and along the gum. Rise mouth with clean water and throw the floss away after using.

Keeping Food and Water Clean

Note: In Appendix F there are more suggestions about how to keep food and water clean.

Eating unclean food and drinking unclean water is a direct way for disease-causing germs to enter the body. These germs can be avoided by using simple techniques that clean food and water and keep it clean for storage.



Questions for Discussions

- How does your community dispose of garbage?
- Do many people in your village become ill from food or water they eat? Do people die?

Keep Feces Separate

Many of the germs that cause food- and water-related illness come from human or animal waste. Keeping feces away from food preparation areas and living areas can reduce food-related diseases.

Latrines should be built at a distance from the living area and kept clean. Animals should not be allowed to wander in areas where food is prepared. Water should come from a central system or protected well and not from streams or

areas where animals also drink. If that is not possible, there are suggestions on how to purify water later in this unit.

Wash Hands

Disease-causing germs come in contact with hands throughout the day: when cleaning the house, working in an office or field, taking public transportation, etc. Always wash hands with clean water and soap before preparing food and eating. Any open cuts on the skin should be covered when preparing food.



How to Cook and Store Foods

Cooking foods for long periods of time reduces the amount of nutrients in the food. This is especially true of foods with lots of vitamins and minerals, such as fruits and vegetables. Cook fruits and vegetables until they are tender, and then immediately remove them from heat and water. When food sits in water for long periods of time, the vitamins leak out of the food and into the water. It is better to steam or fry vegetables in a small amount of water instead of boiling them.

Save any water used for cooking vegetables, because it contains vitamins and minerals from the vegetables. This water can be used for cooking other things such as soups, broths, and porridge.

Tips to Keep Food and Water Clean:

- Wash all fruits and vegetables in clean water or peel them before eating.
- Clean all dishes, cups, and utensils used to prepare or serve food or water.
- Use only clean water for cooking, mouth care, and drinking. If you do not have access to clean water, use some of the tips in the appendices to purify it yourself.

- Cover wounds and open sores before handling food.
- Clean the areas and surfaces where food is prepared.
- Keep cooked and uncooked food separate, especially meat. Uncooked foods can spread germs to cooked foods.
- Cook meat, fish, and chicken thoroughly.
- Store food in a cool place. When possible, refrigerate fresh foods like meats, milk, and vegetables.
- Do not allow cooked foods to sit out for a long period of time. Serve them immediately or refrigerate or store them in a cool place.
- Keep rubbish covered and separate from food. Dispose of it in a place far from food or water supply.
- Keep clean drinking water covered in a container that is washed weekly.

CHAPTER 6

Dealing with Common HIV/AIDS Nutrition-Related Complications



Key Points

- HIV can cause or worsen many nutrition-related complications including diarrhea, vomiting, nausea, weight loss, lack of appetite, heartburn, fatigue, mouth sores, dehydration, and parasites.
- There are many simple remedies that can be done at home to treat, reduce, or prevent these complications.

Purpose

This chapter will identify symptoms and home treatment options for the most common nutrition-related complications and provide information on when to seek medical care.

Diarrhea

Signs and Symptoms. Diarrhea is a condition of having three or more loose or liquid bowel movements a day. Continuing to pass watery stools for longer than a few hours can lead to dehydration, especially when fluids are not replaced. This is a serious health concern, especially for someone with AIDS. In some cases, if diarrhea is not treated, it can lead to death.

Causes. People get diarrhea for a variety of reasons. It is a common symptom of AIDS and can be a side effect of ARVs and other medications. The most common cause is food or water that has been contaminated by human and animal feces. It is also caused by intestinal worms, malaria, and water-borne diseases such as cholera.

What to Do. To replace the fluids lost through severe diarrhea, the person should eat and drink as long as it does not cause vomiting. Oral rehydration fluid, fruit juices, and broths can help quickly replace lost nutrients and water.

Diarrhea can be the body's way of getting rid of unwanted or dangerous things in the stomach. In some cases, it is best not to use medications that stop diarrhea. In other situations, it may be necessary, especially when diarrhea causes significant fluid loss or lasts for more than two days. Consult a doctor or other health care professional if diarrhea does not stop in two days.

What to Eat When Having Diarrhea:

- Soft foods, such as mashed potatoes and yams, porridge, and soft fruits (such as bananas, mangoes, and pumpkins) are easy to eat and digest.
- Peel and cook all foods. This makes it easier to digest and reduces gas in the intestines.
- Avoid high amounts of fats, coffee, caffeinated teas, and sodas.
- Avoid very spicy, very hot, or very cold foods.
- Drink juices, broths, herbal teas, and rehydration fluids to replace fluid.
- Eat frequent, small meals instead of one or two big meals a day.

Health Care Help. It is necessary to consult with a doctor or other health care professional if diarrhea is severe, if there is blood in the stool, or if it lasts more than two days. Diarrhea is especially serious for babies and small children, and the family should seek medical care when it lasts more than 24 hours and the child is unable to drink fluids or eat.

Vomiting/Nausea

Causes. Nausea and vomiting are common symptoms of AIDS. They often occur along with diarrhea. They can be caused by stress, certain foods, and infection. Nausea may be a sign of other health issues such as dehydration, headaches, influenza, becoming overheated, or reacting to food or medication. Both nausea and vomiting might be symptoms of pregnancy.

What to Do. When nauseated, follow the same suggestions given for diarrhea. Drink fluids as tolerated, and rest until the nausea passes. If nausea continues for more than a few days, it may be necessary to consult a doctor who can determine and treat the cause.

When nauseated, sit up to eat, and stay sitting up for half an hour to an hour after eating. Eating dry, salty foods (such as toast and crackers), and taking sips of hot, sweet tea, may help relieve nausea. Some people may need to avoid cooking if the odor of food makes the nausea worse.

If nausea is persistent or reoccurring, try to identify the cause. For some people, it is provoked by foods high in fat or milk products. Pay attention to foods that are eaten before the nausea starts. Avoid these foods for several days. If the nausea goes away and does not return, add these foods back into your diet one at a time until you identify the one that caused the nausea.

If a person is vomiting, take small sips of water, but only if it doesn't cause more vomiting. Do not eat until the vomiting stops. Then take only a small amount of soft food and slowly add solids back into the diet.

Health Care Help. Normally, it is not necessary to seek medical help for nausea and vomiting. If nausea prevents eating or drinking, leading to dehydration, it

may be necessary to consult a doctor or health care professional that can diagnose and treat the cause.

Weight Loss

Signs and Symptoms. Serious weight loss is defined as unintentional weight loss of more than 10 pounds (4.5 kilograms). Signs of weight loss include clothing that becomes too large, eating less, dry skin, weakness, fatigue, and lack of appetite.

Causes. Weight loss is a common symptom of AIDS. It is caused by AIDS-related symptoms such as diarrhea, lack of appetite, depression, mouth sores, and infections. It can also indicate that the person does not have proper access to food and water.

What to Do. If someone is losing weight, focus on eating more high-energy foods. Sometimes, eating 5–7 small meals a day is easier than trying to eat 2 or 3 large meals. Look for ways to increase the amount of high-calorie foods such as milk products and certain grains.

Foods that are high-calorie, high-energy foods include:

- Oils, such as palm, vegetable, olive, and coconut oil.
- Butter.
- Milk products, such as whole milk, cheese, and yogurt.
- Nuts and seeds.
- Red meats.

Ways to Gain Weight:

- Eat snacks between meals.
- Eat more high-calorie, high-energy foods.
- Eat more staple foods such as rice, corn, and bread.
- Use more oil, butter, and lard in cooking.
- Add dry milk powder to food such as porridge and sauces.

If the weight loss is due to another cause (such as diarrhea or intestinal worms), treat that cause.

Health Care Help. The best thing to do when losing weight is to eat more high-energy foods. Someone who is losing weight should contact his or her medical provider to diagnose and treat the cause.

Lack of Appetite

Signs and Symptoms. A person may not feel hungry even though he has not eaten for several hours. Or he may feel hungry, but when he starts to eat, he becomes full quickly. Food may not look or smell as good as it did before he became sick.

Causes. A lack of appetite can be caused by many things, including nausea, pain, tiredness, infections, mouth sores, and depression. Loss of appetite can also be a side effect of some ARV medications.

What to Do. It is important to understand why a person has no appetite, and to try to treat the cause (depression, diarrhea, or influenza, for example). Even if someone does not have an appetite, encourage him to try to eat. The best way to stimulate the appetite is to eat.

How to Increase Appetite:

- Eat smaller meals more often.
- Eat whenever you feel hungry.
- Drink juices and teas before and between meals (several hours before or after eating), but drink little fluid with meals.
- Add flavors to foods. Try squeezing lemon juice over food or adding spices.
- Try many different foods, looking for something that tastes good.
- Eat with family or friends instead of eating alone.
- Do not eat a lot of foods that are difficult to digest, such as beans, lettuce, and other bulky foods.
- Do not drink soda.
- Exercise or take a walk outside before meals.
- Chew on dried fruit such as mangos or oranges to stimulate the appetite.
- Keep the mouth clean and practice good oral hygiene.

Health Care Help. Normally, a person does not need to see a doctor about lack of appetite. But if loss of appetite persists and leads to weight loss, consult with a doctor or other healthcare professional.

Heartburn/Fullness

Signs and Symptoms. Heartburn is a burning feeling in the back of the throat or chest. It may feel like food is coming back up after being eaten. Sometimes there is a bitter or sour taste in the mouth. These symptoms may become worse when a person lies down or bends over.

Causes: Heartburn has nothing to do with the heart. The burning sensation occurs when acid from the stomach comes up the throat. It is a common problem with AIDS and can be a side effect of ARVs. It can also be caused by pregnancy, eating too much food too quickly, and smoking tobacco.

What to Do. A number of different medications can treat heartburn. Some are inexpensive and can be purchased at a pharmacy. Certain foods like sodas, citrus fruits (like oranges and lemons), fatty foods, and fried foods cause heartburn, so avoid these if they make symptoms worse. Sit up when eating and do not lie down for half an hour to an hour after eating. Tight clothes around the waist can make heartburn worse, so wear loose-fitting clothes.

Health Care Help. There are medicines that doctors can prescribe if heartburn is severe or lasts for a long time. If heartburn continues after trying some of these suggestions, talk to your healthcare provider.

Fatigue

Signs and Symptoms. Fatigue is a feeling of extreme tiredness and weakness. A person might become fatigued after simple activities that do not make other people tired. He might feel very sleepy or lack the desire to become involved in any activities. He may feel like he is too tired to even eat.

Causes. The body uses a lot of energy to fight HIV, which can lead to weakness, especially in advanced AIDS. If someone does not have proper nutrition or if the body is unable to absorb food because of diarrhea and vomiting, it can lead to weakness. Other HIV complications such as stress, depression, nausea, and mouth sores can cause fatigue. It is a side effect of many ARV medicines.

What to Do. A person who is fatigued requires at least 8 hours of sleep every night. Naps during the day may help to restore energy. Increasing activity through exercise may stimulate the body and increase energy. Spending time with family and friends provides emotional encouragement that may also stimulate energy.

A person should eat small meals often and should eat whenever hungry, even if it is not meal time. Eat high calorie, high-energy food. If possible, someone should make food for the person with HIV so he does not become tired while preparing the food.

Health Care Help. If the fatigue is caused by a complication of HIV (like an infection or depression), a medical provider can help treat that cause.

Mouth Sores

Signs and Symptoms. Mouth sores—white or red patches in the mouth, throat, and on the tongue—are common complications of HIV infection. The sores may bleed and ooze pus. The mouth, tongue, or throat may become swollen and painful.

Causes. Certain mouth sores associated with AIDS are caused by an opportunistic infection called fungus. These fungi can cause infection anywhere in the body, but they are most common in the mouth.

What to Do. Mouth sores can make eating very painful and decrease a person's appetite. Therefore, avoid spicy, hot, or salty foods and foods that take a long time to chew. Mashed foods and liquids are much easier to chew and swallow. Mixing malting powder or juices into foods can make them liquid and easier to swallow. It may help to use a straw to drink fluids.

Chewing pieces of green mango, kiwi, or green papaya may help relieve pain. It also might help to drink spice teas, fermented sour cabbage water or yogurt. The fungi that cause mouth sores multiply quickly when sugar is present in the mouth, so a person with mouth sores should avoid eating sweet things such as sugary drinks, candy, and honey.

Keeping the mouth clean helps prevent mouth sores and helps them heal faster. If someone can't brush their teeth because of painful mouth sores, add a teaspoon of salt to a glass of water and use it to rinse the mouth several times a day. (Do not swallow the salt water.) It may be helpful to rinse the mouth with clean water before eating.

Health Care Help. Antifungal medicines treat the symptoms of fungal infections and help cure mouth sores and other symptoms.

Dehydration

Causes. Dehydration occurs when a person does not drink enough liquids or loses liquids through diarrhea, vomiting, or profuse sweating. Some people become dehydrated very quickly when they work in the heat without drinking enough water. People become dehydrated or stay dehydrated over a long period of time if they only drink small amounts of liquids.

Symptoms. Headache, dry mouth and throat, dry eyes, weakness and fatigue, thirst, muscle pains, flushed skin, and nausea are signs of dehydration. Symptoms of severe dehydration are an increased heart rate, decreased urine output, dark and strong-smelling urine, difficulty breathing, dizziness, and fainting. Severe, untreated dehydration can lead to death.

What to Do. Replacing fluids is the most important aspect of treatment. An adult needs to drink at least 8 cups of water a day; a dehydrated person should drink at least that much. When a person is dehydrated, he loses important nutrients such as salt and energy. Fruit juices and rehydration fluids replace these and water at the same time.

Health Care Help. Dehydration is dangerous for small children and the elderly or when it is caused by a serious illness. In those cases, it is important to consult with healthcare professionals. In some cases, they will quickly replace fluids with intravenous fluids.

Intestinal Parasite Infections

Signs and Symptoms. Some intestinal parasites live in the body for a long time without causing any symptoms; others cause symptoms a week or two after entering the body. Common symptoms include decreased appetite, swollen abdomen, nausea, vomiting, diarrhea, gas and bloating, weight loss, weakness, bloody stool, stomach tenderness, and abdominal pain. Worms may be visible

in feces or around the rectum. On rare occasions, worms crawl up the throat and come out the mouth or nose.

Cause. Intestinal parasites are found most frequently in areas with poor hygiene and sanitation. They are spread through food and water that is contaminated with human and animal feces. They can enter the body when dirty hands touch the mouth or tongue. Some enter the skin during contact with infected dirt.

What to Do. To prevent parasite infection, prepare food using hygienic techniques, and drink water that comes from a clean source or has been purified. Wash hands after using the toilet or touching dirty surfaces and before preparing food and eating. Keep animals away from food and food preparation areas.

Health Care Help. Traditional treatments may relieve the symptoms of intestinal parasites, but it is difficult to cure an infection without medications. Medical professionals can prescribe medicines for parasite infections. In some countries these medications can be purchased at a pharmacy without a prescription. These medications kill the parasites, but the person will be reinfected if exposed again to what caused the infection.

CHAPTER 7

Special Situations with HIV/AIDS and Nutrition



Key Points

- Pregnant women with HIV have special nutritional concerns, such as an increased need for certain vitamins and minerals.
- Young children and babies are still developing, so it is critically important they get the nutrients they need.
- ARVs affect a body's ability to process food and may produce uncomfortable side effects. What a person chooses to eat can affect how ARVs work in the body.
- Nutritional supplements are useful, but they should be taken with care.

Purpose

This chapter will identify and respond to the most common issues related to HIV/AIDS and nutrition.

Nutrition During Pregnancy

When any woman becomes pregnant, her nutritional needs change. She needs to eat increased amounts of staples and body-building foods along with small amounts of high energy foods. This is especially true of pregnant women who are infected with HIV.

The immune system of a pregnant woman works very hard to keep her healthy and protect the baby. Pregnancy can be very hard on the body of a woman with HIV. If her immune system is already weak, pregnancy can weaken her system even more rapidly. She must take steps to strengthen and protect her body through good nutrition and adequate rest. She should consult with a health care professional, who may prescribe ARVs that greatly reduce the risk of passing HIV to her baby.

The immune system of a pregnant woman works very hard to keep her healthy and protect the baby.

Good nutrition during pregnancy is important for the health of the baby. Folic acid helps a baby's nervous system develop and prevents birth defects. It is found

in green leafy vegetables such as spinach, citrus fruits (oranges, lemons, etc.) and beans and peas.

Calcium is another nutrient that is very important for pregnant women and small children. It is found in foods such as milk, milk products like yogurt and cheese, spinach, and some fruit juices.

Nutritional Needs of Infants and Young Children

Babies and young children grow quickly, and they need good nutrition for bone and muscle development. Certain vitamins and minerals found in fruits and vegetables are especially important for young children. Vitamin A is important for good vision and preventing anemia (not enough red blood cells to transport nutrients through the body). Folic acid and calcium are also essential for healthy development.

Good nutrition is critical for children with HIV. Their bodies are developing and fighting HIV at the same time. Good nutrition is essential to help them stay healthy as long as possible.

Food insecurity is a significant problem for many children affected by HIV. They may have lost one or both parents to AIDS, or their parents might be sick as well. Some churches have programs to assist these children in getting food and clean water.

Nutrition and ARVs

Questions for Discussion



- Are antiretroviral medications available in your area? Are they easy or difficult to attain?
- Do they cost money? How are ARVs paid for in your area?

Antiretroviral treatment (ART) is a combination of medications that fight HIV. They allow a person with HIV to live a longer, healthier life. They are not, however, a permanent cure for AIDS. ARVs are available in many parts of the world. Sometimes they are provided free of charge, and sometimes they can be purchased at a reduced price.

Nutrition plays a role in effective ARV therapy. A strong, healthy body is better able to absorb and use the medicine.

Some ARVs have negative side effects that affect nutritional status. For example, some raise cholesterol levels, which can lead to heart disease. This can be controlled by avoiding foods that contain cholesterol, such as fatty or fried food.

The helpful benefits of the medication usually outweigh the negative effects. There are no substitutes for the life-prolonging effects of ARV. If side effects are very severe, a medical professional might try a different combination of medi-

cines. A person on ARV must never stop taking the medications once they begin treatment. They must be taken exactly as prescribed, never missing even one dose. An interruption in treatment can lead to severe health consequences and medication resistance.

Common side effects of ARV include nausea, diarrhea, changes in the taste of food, weight gain, lactose intolerance, weakness, high cholesterol, insulin resistance, and dry mouth. Eating healthy, nutritious foods can control many of these symptoms. A medical professional can prescribe medicines to control certain side effects of ART.

Some foods interact with ARV medications. This can be positive or negative. For example, taking certain types of ARVs with a meal helps the body absorb them more effectively. Others, however, cannot be taken at the same time as food. It is very important to understand when each medication should be taken (before or after a meal) and if specific foods should be avoided with certain medications.

Herbal supplements or home treatments can also interact with medications. For example, St John's Wort is an herb some people use to help treat depression, but it can interfere with ART. Someone on ART should always consult with a health care professional before taking supplements or home treatments.

Supplements

If a person is able to eat a balanced diet, the food provides all the vitamins and minerals he needs. However, if nutritious foods are not available or are too expensive to buy or he is too sick to eat, he may need a vitamin supplement.

Vitamin supplements are pills or powders that contain nutrients that a person needs on a daily basis. Supplements should be taken as prescribed. They are often taken once a day, immediately after a meal.

APPENDIX A

Malting

Special Processing of Grains and Porridges

This section gives instructions on how to process foods to help when a person may have mouth sores or difficulty in swallowing.

Malting means allowing cereal grains to germinate (start sprouting) by soaking them in water for two days, then spreading them out on sacks and covering them with a damp cloth. They are left in the dark and kept damp for two to four days. After malting, the grains should be washed and dried before they are roasted, fermented, or pounded into flour. Do not to use grains which have developed mold because they can become toxic.

To meet the increased demands for calories and protein, well-cooked mashed cereals mixed with milk and sugar can be given to the person. Calorie-dense cereals can be prepared by malting; also, sprouted pulses and beans can be used (see “Seed Sprouts for Eating” below). Cereals like wheat, bajra, ragi, jowar, and pulses like moong (whole) can be malted.

How Is The Food Malted?

- **Step 1:** Soak overnight.
- **Step 2:** Remove the water and tie in a moist cloth and keep in warm place (sprouting).
- **Step 3:** After 48 hours, sprouts should come out. Dry in sun or roast it.
- **Step 4:** Grind into flour.

Advantages

- Due to the conversion of starch into amylase, gruels are made thinner. With this, either the person can consume more gruel or more flour can be added to make thick gruel. This way a person gets more energy from each bite they eat.
- Also, ½ to 1 teaspoon of malted cereal, added to porridge, khichri, or other weaning foods, will reduce its viscosity (or thickness) and children will be able to eat a larger amount of it. This is a very good way of increasing the amount of energy in weaning foods for small children.
- The malting process increases the amount of some vitamins and minerals like vitamin B and C.

- A major advantage of preparation of these energy-dense foods is that they are precooked. Thus, these cereals in powdered form can be stored in airtight bottles. They can be mixed with boiled water, cooked for a few minutes, and eaten.

However, these foods should not be the only thing a person eats but should be given 1–2 times in the entire day.

Malted grains do spoil easily, so malting has to be done every 3–4 weeks.

Fermentation turns some of the starch in flour into acidic products. This sours porridge, making it thinner with a higher concentration of nutrients. Also, it makes some nutrients like iron and zinc easier for the body to absorb. Bacteria that cause diarrhea are less likely to grow in soured porridge than in ordinary porridge.

How Is Food Fermented?

- **Step 1:** Mix flour with water so the mixture is liquid.
- **Step 2:** Leave it to ferment overnight in a covered container.
- **Step 3:** Cook as normal the next day.

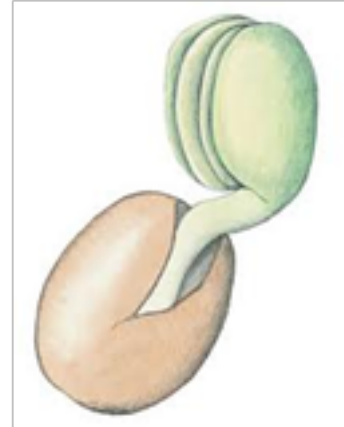
The flour and water mixture becomes sourer the longer it is left to sit out. Cooked porridge can also be soured by adding a spoonful of previously fermented porridge.

How To Ferment Cereals At Home—Millet, Rice, Maize, Amaranth, Beans, and Lentils

- **Step 1:** Soak the desired amount of grain in an equal amount of water to which you've added 1 tablespoon raw vinegar, fresh lemon juice, or plain yogurt.
- **Step 2:** Cover and let sit at room temperature for at least 7 hours, preferably longer.
- **Step 3:** When ready to cook, add remaining required amount of water and cook as you normally would. (For beans, discard the soaking water before cooking.)

Seed Sprouts for Eating

Some seeds are planted with the intent to grow and harvest fruits, vegetables or grains, but others can be used to grow sprouts for eating. Sprouting is the practice of germinating seeds to be eaten either raw in salads, sandwiches, and scrambled eggs or to be cooked in stews and soups.



Advantages of Sprouted Foods:

- They increase the vitamin, mineral, and protein content of foods.
- They contain many live enzymes that help food to be digested.
- They cut down on cooking time.
- They are an easy and cheap way to obtain fresh food.

Method of Sprouting Foods:

Grow different kinds of sprouts such as alfalfa, beans, lentils, peas, sorghum, and sunflower, but grow them in different jars, since they need different amounts of time to sprout.

- **Step 1:** Put the amount of seed shown in the chart in a jar.
- **Step 2:** Fill the jar half full with clean water.
- **Step 3:** Use a tight rubber band to secure cheesecloth or mesh over the jar.
- **Step 4:** Soak seeds overnight (or as long as shown in the chart).
- **Step 5:** Drain water. Put the jar down at an angle so that the water can drain off (a dish rack is perfect for this).
- **Step 6:** Keep the jar in the dark until sprouting begins.
- **Step 7:** Rinse the sprouts to remove the shells twice a day, with clean and safe water, morning and evening; if it is very hot, rinse more often.
- **Step 8:** Place in a cool place or refrigerator until ready to eat.
- **Step 9:** Eat the sprouts after the length of time shown in the chart.

Type of seed*	Amount of seed per jar	Time to soak seeds	Approximate time until ready to eat	Length of sprout when ready to eat
Alfalfa	3–4 table- spoons	4 hours	4–6 days or until seeds develop green leaves	3 cm
Beans	1 cup	Overnight	4–7 days	1 cm
Lentils	1 cup	Overnight	2–5 days	½–1 cm
Maize	1 cup	Overnight	3–4 days	1 cm
Peas	1 cup	Overnight	2–5 days	1 cm
Sorghum or millet	1 cup	Overnight	2–3 days	½ cm
Sunflower (without husks)	1 cup	Overnight	1–3 days	½–1 cm

*Care should be taken to ensure seeds to be used for sprouting have not been chemically treated.

APPENDIX B

Examples of Foods in Major Food Groups

Body-Building Foods/Proteins	Staples/Carbohydrates	High-Energy Foods/Fats
Fish	Bran	Butter
Beef	Wheat germ	Oil
Chicken	Barley	Coconut milk
Pork	Maize	Peanut oil
Milk	Buckwheat	Olive oil
Cheese	Cornmeal	Peanut butter
Goat milk	Oatmeal	Vegetable oil
Yogurt	Pasta	Sugar
Peanuts	Macaroni	Corn syrup
Peanut butter	Spaghetti	Lard
Nuts	Brown rice	Animal fat such as bacon
Duck	Potatoes	
Turkey	Other root vegetables	
Cottage cheese	Whole meal breads	
Soybeans	Brown bread	
Crab	Pita bread	
Shellfish	Wholegrain cereals	
Eggs	Porridge oats	
Peas	Muesli	
Navy beans	Cassava	
Pinto beans	Corn	
Lima beans	Yam	
Chickpeas	Peas	
Black beans	Beans	
	Lentils	

APPENDIX C

Uses of Herbs in Managing Effects of HIV

Adapted from the UNAIDS manual *Living Well with HIV/AIDS: A manual on nutritional care and support for people living with HIV/AIDS*. Used with permission.

Herb	Benefits found by some people living with HIV/AIDS	How to use
Aloe	Helps to relieve constipation.	Use as extract; boil and drink the concentrated water. To be used in limited amounts; stop immediately if it causes cramps or diarrhea.
Basil	Helps to relieve nausea and aid digestion; has an antiseptic function for mouth sores.	Add to food to treat nausea and digestive problems. Use as a gargle for mouth sores.
Calendula	Flower heads have antiseptic, anti-inflammatory and healing function. Helps with infections of the upper digestive tract.	Use as a compress to treat infected wounds. Prepare as tea to help digestion.
Cardamom	Helps with digestive problems, pain, diarrhea, nausea, vomiting, and loss of appetite.	Add to food during cooking or prepare as tea.
Cayenne	Stimulates appetite, helps fight infection, and heals ulcers and intestinal inflammation.	Add a pinch to cooked or raw foods. For an energizing drink, add to fruit juice or water.
Chamomile	Helps digestion and provides relief for nausea.	Prepare tea from the leaves and flowers and drink several cups throughout the day.
Cinnamon	Good for colds and for weakness after colds or flu. Also used when feeling cold or for diarrhea and nausea. Stimulates appetite. Gently stimulates digestive juices, encouraging bowel movements.	Either add to meals or to tea, particularly ginger cinnamon tea for chest colds or tuberculosis.

Herb	Benefits found by some people living with HIV/AIDS	How to use
Cloves	Stimulate appetite, help weak digestion, diarrhea, nausea, and vomiting.	Use in soups, stews, warmed fruit juice, and tea.
Coriander	Helps to increase appetite and reduce flatulence. Controls bacteria and fungi.	Add herb to meals.
Eucalyptus	Has an antibacterial function, particularly for lungs and during bronchitis. Eucalyptus oil from leaves increases the blood flow and reduces the symptoms of inflammation.	Prepare tea from the leaves or extract.
Fennel	Helps to increase appetite, combat flatulence, and expel gas.	Add as spice to foods or prepare tea from the seeds. Use in limited amounts.
Garlic	Has antibacterial, antiviral, and antifungal function, particularly in the gut, intestines, lungs, and vagina. Helps digestion and feeling of weakness. Also good for thrush, throat infections, herpes, and diarrhea.	Prepare in tea or energy drinks or use in food.
Ginger	Improves digestion, energizes, relieves diarrhea, and stimulates appetite. Used for treating common colds, flu, and nausea.	Use either as a spice in meals or prepare a ginger tea.
Lemon	Antibacterial and helps digestion.	Add lemon juice to food or drinks.
Lemon Grass	Has a calming effect as well as soothes digestion and alleviates stress.	Use as tea.
Mint	Has an anti-inflammatory effect and helps digestion.	Use as tea or gargle for mouth sores. Chew mint leaves to aid digestion.
Neem	Brings down fever.	Cut a fresh twig, remove the leaves, and boil the bark in water; drink as tea. The bark can also be chewed.

Herb	Benefits found by some people living with HIV/AIDS	How to use
Parsley	Reduces intestinal colic. Stimulates stomach secretions and activities and produces a feeling of hunger. The seed is used to remove excess water from the body.	Add raw or cooked to food.
Peppermint	May help nausea. Reduces colic (abdominal pain and cramps), helps to control diarrhea and stop vomiting. Used for relieving tension and sleeplessness.	Prepare as tea by boiling the leaves for about ten minutes. Add to food. (Peppermint can easily be grown in the garden and or in a pot near the house).
Thyme	Has antiseptic and antifungal function. Relaxes nervous coughing and increases mucosal secretions. (particularly effective in the gut) Stimulates digestion and the growth of the good intestinal flora in the gut.	Use as gargle or mouthwash, as a vaginal douche, or as tea.
Turmeric / Yellow Root	Digestive aid, antiseptic, and antioxidant.	Use powdered in rice, cereals, etc.

APPENDIX D

Easy Recipes to Help Manage HIV

Broths

Broths are simple warm fluids that can be drunk plain; mixed with meat, beans, rice, and vegetables to make soups; or used in cooking as a replacement for plain water to add calories and flavor.

Broth is made by boiling meat, chicken, vegetables, beans, or rice in clean water until the food is cooked. The water can be drained off and used as a broth. The longer it is cooked, the stronger the broth becomes.

Oral Rehydration Fluid

Oral rehydration fluid mixes come in packages that you can buy at the store or druggist, but you can also make your own at home.

Ingredients:

- 1 liter of clean water
- Half a teaspoon of salt
- 8 teaspoons of sugar

Directions:

Mix or shake all together in a clean bottle or container. Mixture should not taste any saltier than tears. You may also mix in juices or flavorings if you prefer.

Porridge

Ingredients:

- 1 liter clean water
- Half a teaspoon of salt
- 8 teaspoons of powered cereal such as powdered rice, finely ground wheat, maize, or cooked potatoes

Directions:

Combine all and boil for 5–7 minutes until the mixture makes a soupy porridge. Cool some before eating. Can be drunk hot or cooled.

APPENDIX E

Gardening

Growing a vegetable and herb garden can help save money as well as provide good nutrition. Though some gardens can be labor-intensive, this section offers some simple and easy ways to grow a garden for those who may not feel well or are not able to do heavy labor.

Site Consideration

Before planting a garden, choose a location that is sunny, close to the house, near a water source, and protected from animals.

Types of Gardening

Container Gardens

Many things can be used as containers for gardening, such as tires, sacks, and barrels. There are many advantages of using containers; they can be placed anywhere—in the sun, away from animals, and close to the house for easy watering. Containers can even be placed on a table or stand to lessen the labor of bending over or getting down on knees to work the garden.

Tire Garden

This garden is made from an old tire and a small sheet of plastic film (e.g. a garbage bag).

Place a piece of plastic inside the tire on the bottom rim, large enough so that an inch or two of plastic stands up along the walls of the tire. If the plastic is trimmed to near the bottom of the tire, the garden will essentially be a portable shallow bed garden for wet areas. If the plastic is left so that a pool of water is formed, it will be more like the shallow pool garden for dry areas. Fill with soil and compost. Next plant your seeds or seedlings and cover with mulch.

For planting potatoes, use 3 tires stacked on top of each other. The bottom tire is filled with soil and seed potatoes are planted. As the plants come to the surface more soil is added until all the tires are filled. Empty soda cans are placed between the tires to allow more air to get to the roots.

Sacks and barrels can be used in much the same way as tires, as can be seen from the photos:



Horizontal Sack Garden



Vertical Sack Garden

Square Foot Gardens

Square foot gardening is a simple above-ground method that utilizes an open-bottomed box to contain the soil and is divided up into a grid to allow intensive planting. Each square in the grid can be planted with different types of plants—the number of each depends on the variety and size of the mature plants.

Following is the method of construction and preparation:

- Place landscape cloth (some type of permeable weed barrier) on ground.



- Build a frame approximately 4 by 4 feet or 1 meter square and approximately 12 inches or 30 centimeters in height.
- Prepare the soil medium using available organic materials, mixing them well.
- Fill the frame completely to the top; material will settle over time—add new material as needed.
- Build grid in 12 inch or 30 centimeter blocks with thin wood or metal material.
- If growing vegetables with vines, a support will need to be added.
- Visualize the layout and size of mature vegetable plants, and choose varieties carefully.
- Supports can be used for placing a covering for protection from birds and animals.

Door-Size Gardens

Many homes, particularly in urban areas, have little room for growing crops or vegetables. However, outside nearly every house is an area of bare ground. The soil may be hard or infertile, and people often do not consider using it for growing vegetables. But here is one way of using this unused space for a tiny garden. The system works best if a number of families agree to work together, building one garden each week.

Mark out a space the size of a door (about 1 by 2 meters). Dig out the soil until it is nearly knee-deep. If the soil is very hard, this will not be easy! Lots of people working together will help. Be careful to keep the top soil (darker color) in a separate heap from the subsoil (lighter color and more stones).

Line the hole with grass and other organic material. Encourage all the families to bring their organic household waste for that day—vegetable peelings, waste



paper, and egg shells—and tip it into the hole. If you can find any animal manure, add this.

When the pit is half full, pour water on to soak the waste. Then add the subsoil, followed by the topsoil. Plant rows of vegetable seeds and herbs. Useful plants which will add flavor and vitamins to the household diet include tomatoes, spinach, traditional leafy vegetables, peppers, beans, carrots, onions, and all kinds of herbs. Try to plant taller plants such as tomatoes and climbing beans in the



middle. Cover with mulch—a thin layer of grass, straw, rice husks or similar materials. Water well. Household wastewater is ideal to use to water with if not too soapy.

If possible, find an old broken basket and sink this into the center of the plot. Over several weeks, fill this with vegetable waste and weeds. Water mainly through this basket once the young plants are established. This will wash more plant nutrients into the soil. Now decide whose home will have the next door-sized garden. If there is space, you may be able to build several of these.



African Cooperative Action Trust (ACAT) in South Africa has used this idea in KwaZulu-Natal with great success. Many people have been amazed at how easy it is to produce their own vegetables. One lady said she thought she could only grow traditional crops like maize. But now she can grow cabbages, spinach, and onions. Her husband is very impressed!

Conservation or No-Till Method Planting

Conservation farming is any system or practice which aims to conserve soil and water by using surface cover such as mulch to minimize runoff, evaporation, and erosion, and to improve the conditions for plant establishment and growth. It involves planting crops and pastures directly into land which is protected by mulch using minimum or no-tillage techniques.

Farming God's Way

This is a method where planting stations are dug, compost is added to each hole, and then the seed is planted. Then mulch (brown, dried plant waste such as corn stalks, grass, banana leaves, etc.) is placed around the plants, creating a blanket.

The same planting stations are used for the next planting. Crop types are rotated (using different plants in order to prevent pests and diseases and enrich the soil with nutrients). This replaces what has been taken out of the soil. For example, beans or peanuts are the next crop planted after corn in order to add nitrogen back to the ground.

For more information, see www.farming-gods-way.org/Resources/



Preparing the Soil for Planting a Garden

Rich, fertile soil is required to produce healthy plants. Hard or compact, dry soil does not allow the roots of the plants to develop and keeps plants from being able to absorb nutrients that promote strong, healthy plants that can produce a good harvest. The following sections provide instructions on how to easily and economically enrich soils for planting.

Composting, Natural Fertilizers, and Mulching

Composting is an excellent (and inexpensive) way to add organic matter to your garden spot, raised beds, or container gardens. It reduces the need for supplemental watering and fertilizing. Soil structure is improved and minerals are added, increasing both the fertility and health of your soil, making your plants more resistant to pests and disease. Organic compost is made from using your vegetable kitchen scraps (coffee/tea grounds, egg shells, peelings, etc.), leaves, straw, ashes, grass clippings, vegetable-eating animal manures, and most anything organic. So as an added benefit, the recycling of these organic wastes helps



extend the lifetime of landfills. All plant materials contain nitrogen and carbon—materials high in nitrogen are called “greens” (fresh grass clippings, manure, and kitchen scraps) and those high in carbon are called “browns” (dried leaves, sawdust, woodchips, etc.).

To make compost, mix or layer equal amounts of “greens” and “browns” in a pile or bin, adding layers of native soils, and keep it moist (but not excessively wet). Items used should be cut into small pieces approximate 2–3 inches in length or shredded. The compost should be made directly on top of level, well-drained soil instead of on concrete to take advantage of beneficial earthworms and or-

ganisms. The compost pile or bin should be turned or mixed every few days (at least every 2 weeks) with a shovel or pitchfork to enhance the decomposition process. New materials can be added anytime, but it is advisable to bury kitchen scraps deep into the pile to keep animals out. “Greens” will cause the compost to heat up and therefore decompose more rapidly.

When can it be used? The compost is ready when it is dark brown, and crumbly and has an earthy odor. Once ready, it can be added to an existing or new garden spot/container/bed and mixed in with the soil. It is best that the compost be used directly in the planting rows or locations where seeds or plants will be placed.

Mulch around the plants after they reach 6–8 inches in height to reduce soil drying and weeds. Many options for mulch are available—compost or other organic materials such as newspaper, dry straw, dry leaves, dry grass, or other dry plant materials. Avoid plant materials with seeds.



Manure Tea is a natural concentrated liquid fertilizer made from steeping manure in water to dissolve the nutrients in the water. It appears as a tea-colored mixture when ready. The tea can be used to wet furrows or planting holes before sowing seed or planting seedlings/plants. Allow the tea to dissipate before planting to allow the nutrients to permeate the soil.

To Make Manure Tea

- **Step 1:** Place a large, double handful of manure (one handful for strong manures such as chicken) in a burlap bag.
- **Step 2:** Soak in a 5-gallon bucket of water for a week.
- **Step 3:** Remove the bag of manure and squeeze (or drip) all the water out back into the bucket.
- **Step 4:** For a faster process, the manure can be added directly to the water for three days, stirring daily, and allowing the manure to settle or strain through burlap.
- **Step 5:** The tea is then ready for use as a liquid fertilizer.

What and When to Plant

Plant varieties should be selected that will provide vegetables, herbs, and fruit with a wide range of nutritional value. Gardens should not be limited to just one

or two types of plants. Consult with local farmers and gardeners to determine varieties that will grow in the area and to learn the best times and seasons to plant. When possible, vary the planting times so that harvests are not all at the same time. Crops or plant types should be rotated.

Understanding the Difference between Annual and Perennial Plants

An *annual* plant grows from seed and blooms and sets seed and then dies in just one growing season. Annuals need to be replanted each spring. Tomatoes are one example. Annuals tend to grow easily from seed and often are less expensive.

A *perennial* plant lives for three or more seasons. (The *p* in *perennial* can remind that it is also *permanent*.) It may or may not be mature enough to bloom the first year from seed. Perennials will need periodic rejuvenation and/or replacement, typically every three to five years. An advantage of the perennial is that it does not need to be replanted each year.

Some well-known perennial vegetables from the temperate regions of the world include asparagus, artichoke, and rhubarb. Examples in the tropics are cassava, sweet potato, and taro.

Perennial Herbs

- Basil (African Blue, East Indian)
- Chives
- Fennel
- Garlic
- Ginger
- Horseradish
- Lavender
- Lemon Balm
- Mint
- Onions (Potato onions, Shallots, Egyptian onions, Japanese bunching onions, Welsh onions, Chinese leeks)
- Oregano
- Parsley
- Rosemary
- Sage
- Thyme

Types of seeds—the difference between *heirloom* and *hybrid* seeds.

When saving seeds to replant in the next growing season, it is important to choose open-pollinated *heirloom* seeds. This is normally printed on the package or seed sack. Heirlooms are always open-pollinated varieties (types of seeds). This means that if the seeds produced from the plant are properly saved, they will produce the same variety year after year.



This cannot be done with *hybrids* which are a cross between two separate varieties. The seed produced from those plants will either be sterile, or start to revert back to the parent plants. Though the seeds from hybrid plants may look perfectly fine, they will not produce a good crop.

To save heirloom seeds, follow these steps.

Three Steps to Wet Processing Seeds:

1. **Removal of Seeds.** Large fruits are cut open and the seeds are scraped out. Small fruits are usually crushed or mashed. The seeds, pulp, and juice from the fruits may need to go through a fermentation process. During the fermentation process, microorganisms such as bacteria and yeast destroy many of the seed-borne diseases that can affect the next generation of plants.
2. **Washing Seeds.** The process for washing seeds to remove them from the surrounding pulp or to separate them from the fermenting mixture is basically the same. The seeds and pulp are usually placed in a large bowl or bucket. Add at least twice as much water as the volume of seeds and pulp, and stir the mixture vigorously. Viable seeds tend to be more dense and sink to the bottom, but poor-quality seeds tend to float and can be scooped out. Add more water and repeat the process until only clean seeds remain. The seeds are then poured into a strainer and washed under running water.
3. **Drying Seeds.** Dump the cleaned seeds onto a glass or ceramic dish, cookie sheet, window screen, or a piece of plywood. Do not attempt to dry the seeds on paper, cloth, or non-rigid plastic because it can be extremely difficult to later remove the seeds from such surfaces.

Spread the seeds as thinly as possible on the drying surface and stir the seeds several times during the day. Always remember that damage begins to occur whenever the temperature of the seeds rises above 95°F. For that reason, never dry seeds in the oven. Even at the lowest settings, the temperatures in an oven can vary enough to damage the seeds.

Never dry seeds in the direct sun if there is any chance that the temperature of the seeds will exceed 95°F. Always remember that the air temperature is often not the same as the temperature of the seeds. Even at air temperatures around 85°F, dark colored seeds can sometimes become hot enough to sustain damage.

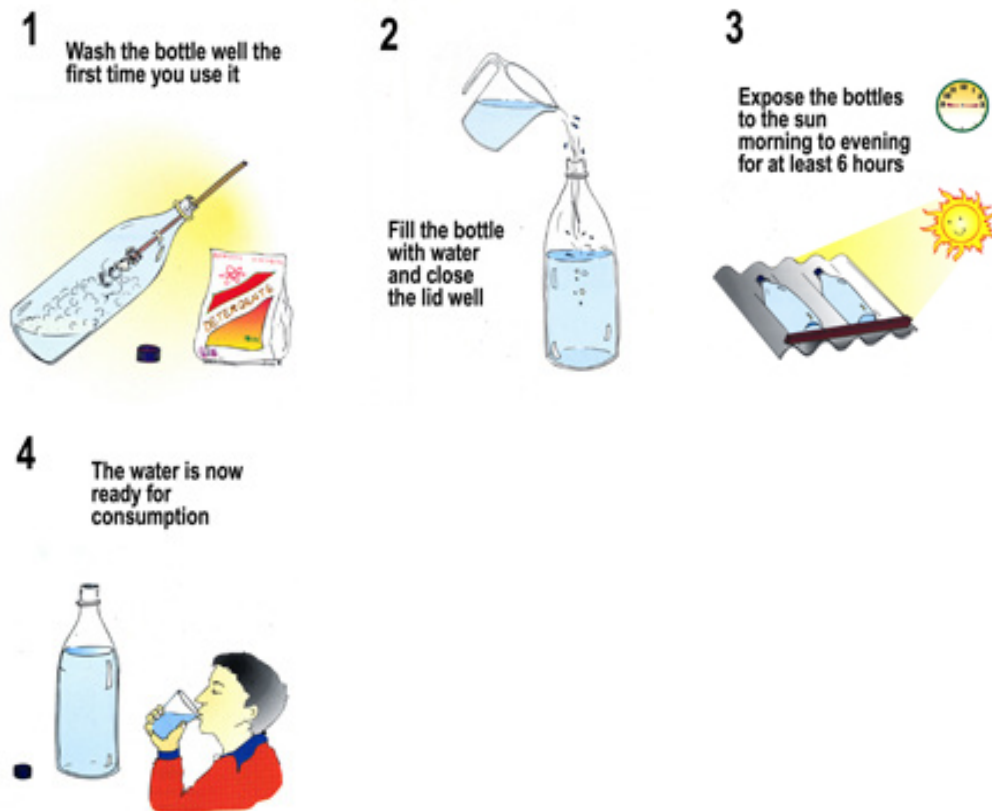
APPENDIX F

More Ways to Keep Food and Water Clean

SODIS/Clean Water (Eawag Aquatic Research)

Solar Water Disinfection, or SODIS, is a simple, low-cost method used in many developing countries to provide clean drinking water.

Basically, a transparent PET (or clear plastic) bottle is cleaned with soap. Then the bottle is filled with water and placed in full sunlight for at least 6 hours. The water has then been disinfected and is ready to drink.



SODIS Source information: Eawag Aquatic Research, Swiss Federal Institute of Aquatic Science and Technology. http://www.sodis.ch/index_EN

Notes:

- The bottles must be transparent and colorless. PET bottles often have a bluish tinge. This is not a problem. Heavily scratched bottles must be replaced.
- The bottles must not hold more than 3 liters.

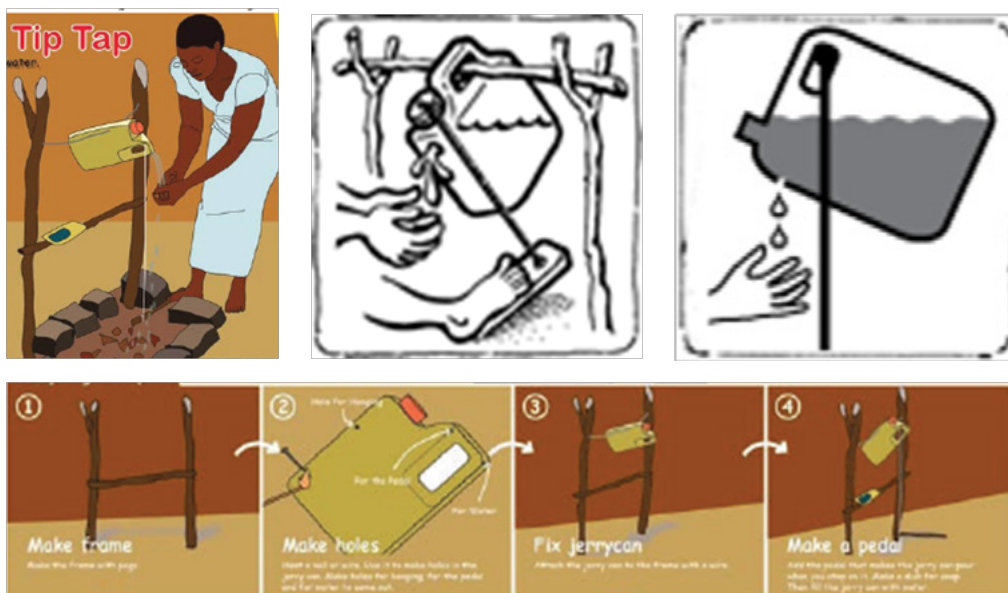
- If the water is very turbid (muddy), the effectiveness of the method is reduced and the water will have to be filtered, such as pouring it through a clean cloth.
- Guidelines for determining cloudiness:
 - If less than half of the sky is clouded over, 6 hours will be enough to completely disinfect the water.
 - If more than half of the sky is covered with clouds, the bottle must be placed in the sun for 2 consecutive days.
- The treated water should be kept in the bottle and used directly from the bottle, or poured into a clean cup or glass immediately before drinking. In this way, it is possible to prevent the treated water from becoming contaminated again.

Hand Washing—“Tippy Tap” method

The Tippy Tap is a simple device for hand washing with running water. A container of about 5 liters or 1.5 gallons with a small hole near the cap is filled with water and tipped with a stick and rope tied through a hole in the cap. As only the soap is touched with the hands, the device is very hygienic. A gravel bed is used to soak away the water and prevent mosquitoes.

When the container is empty, the cap is unscrewed and the container is removed from the stick. The container is then filled again at a water pump, and reassembled.

Experience has shown that it is better to use a piece of metal wire than using a piece of rope, as the rope will often break after a while.



APPENDIX G

Nutritional Aspects of Herbs, Fruit Trees, and Moringa

Growing Herbs

The optimum growing conditions vary with each individual herb species.

When growing herbs, follow these basic guidelines:

- Plant herbs in average garden soil with organic matter added to improve texture and drainage.
- Choose a site that receives at least 6 hours of direct sun each day.
- Avoid ground where water stands or runs during heavy rains.
- Compensate for poor drainage with raised beds supplemented with compost.
- Apply balanced fertilizers sparingly to leafy, fast-growing herbs.

Heavy applications of fertilizer, especially those containing large amounts of nitrogen, will decrease the concentration of essential oils in the lush green growth. Group herb plantings according to light, irrigation, and soil requirements. Most herbs enjoy full sun, but a few tolerate shade. Herbs can be classified as either annual, biennial, or perennial. Be aware of the growth habits of the plants before you purchase them. Some herbs, such as borage, anise, caraway, chervil, coriander, cumin, dill, and fennel should be direct-seeded because they grow easily from seed or do not transplant well. Other herbs, such as mints, oregano, rosemary, thyme, and tarragon, should be purchased as plants and transplanted or propagated by cuttings to ensure production of the desired plant.

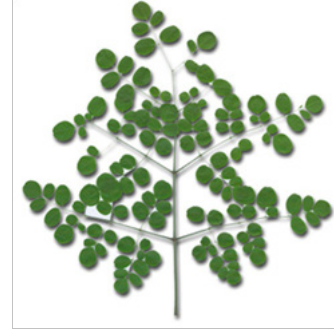
Fruit Trees

Eating fruit is important and even vital for good health and proper maintenance of the body. Most fruits are naturally low in fat, sodium, and calories. None have cholesterol. Fruits are important sources of many nutrients, including potassium, dietary fiber, vitamin C, and folic acid.

Including fruit trees in the garden can be very useful because once they are planted, they continue to reproduce and typically require minimal maintenance when varieties are chosen that are native to the area.

*Moringa Tree (*Moringa oleifera*)*

The uses for moringa trees are as varied as the names it is known by, such as clarifier tree, horseradish tree and drumstick tree (referring to the large drum-



stick shaped pods). In East Africa, it is called “mother’s best friend.” Virtually every part of the tree can be used for nutrition in some way.

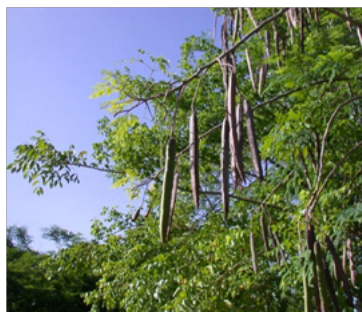
The pods are extremely nutritious, containing all the essential amino acids that come from body-building foods and many vitamins. The immature pod can be eaten raw or prepared like green peas or green beans, while the mature pods are usually fried and possess a peanut-like flavor.

The pods also yield 38–40 percent of non-drying, edible oil known as ben oil. This oil is clear, sweet, and odorless and never becomes rancid. Overall, its nutritional value most closely resembles olive oil.

The thickened root has been used as a substitute for horseradish. This is now discouraged because it contains alkaloids called moriginine and a bactericide called spirochin, both of which can be deadly if eaten in large amounts.

The leaves are eaten as greens, in salads, in vegetable curries, and as pickles and used for seasoning. They can be pounded and used for scrubbing utensils and for cleaning walls. Leaves and young branches are eaten by livestock.

The bark can be used for tanning and also yields a coarse fiber. The flowers, which must be cooked, are eaten either mixed with other foods or fried in batter and are rich in potassium and calcium.



According to Optima of Africa, Ltd., a group that has been working with the tree in Tanzania, 25 grams daily of moringa leaf powder will give a child the following recommended daily allowances:

- Protein: 42 percent
- Calcium: 125 percent
- Magnesium: 61 percent
- Potassium: 41 percent
- Iron: 71 percent
- Vitamin A: 272 percent
- Vitamin C: 22 percent

These numbers are particularly astounding; considering this nutrition is available when other food sources may be scarce.



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Tiny leaves.
Enormous benefits.



Learn more:

http://www.moringanews.org/moringa_en.html

<http://www.treesforlife.org/our-work/our-initiatives/moringa>

<http://www.echonet.org/content/agriculturalResources/611>

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