NUTRITION TRAINING MANUAL

DEVELOPED FOR TEA COMMUNITIES IN UGANDA
Acknowledgements

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Document Overview

Introduction

This manual has been produced to support Mpanga and Rwenzori employees in providing nutrition training to workers and their families who live in housing provided by the tea estates. Potential users of this manual are: field managers / officers, welfare officers, nurses, doctors, labour line leaders, or anyone else with an interest in this area. The authors have presented the information in an accessible way so that not much background knowledge on nutrition is required before undertaking training delivery.

The manual was developed with the clear intention of improving the food and nutrition security – and ultimately the health - of the Mpanga and Rwenzori tea workers and their families. It aims to complement the kitchen garden programme that is being rolled out in the labour lines of Mpanga and Rwenzori, also with the support of ETP, IDH and TGB.

In order to establish the current nutritional status of the workers, a nutrition baseline assessment was carried out by UGAN in May 2014. The manual describes the key results of this study and provides information on how the food and nutrition security of the workers can be improved through a more varied diet, the consideration of wider health/food issues such as food hygiene, disease prevention, as well as food storage and food preservation.

This is a freely available resource and we would like to encourage other tea producers to use it – in addition to other user groups such as schools, nurses, church groups, etc.

How to use the manual

The manual has been divided into 3 modules so as to allow for 3 separate sessions to take place and not overload workers with too much information in one go. The modules cover:

Module 1: Food & Nutrition Security

Module 2: Nutrition & Health

Module 3: Food Safety, Storage & Preservation

When workers were interviewed as part of the baseline survey the majority of them made it clear that they would prefer to receive short but frequent training sessions, ideally on the weekend, rather than one long training session over a whole day or two consecutive days.

The manual was developed for the trainers, not for distribution amongst the workers. When workers and/or their family members attend the sessions, they should be given the 1-page hand-outs which were developed for each of the modules. These hand-outs give a short summary of what was covered during the sessions. In addition, the poster developed by the ETP and UGAN should be used during the training and can be hung at strategic places around the estates where they are visible to many workers (e.g. on the wall of the dispensaries).
Introduction

We all need food. It allows us to be alive, to grow and be active and in the case of women, it can sustain the growth of a baby. What we eat (our diet) has the power to keep or make us and our children healthy and give us a better life.

In the context of tea production, which is very labour-intensive, it is important to point out that the diet of the workers will impact not only on their health – and thus their ability to function physically and mentally – but also on their labour productivity.

This module covers: the definition of nutrition, the role of nutrients in our body, the food sources of these nutrients, the importance of adequate feeding, the concepts of ‘a balanced diet’ and ‘food and nutrition security.’ The module starts by outlining the current food and nutrition security situation in the tea estates of Rwenzori and Mpanga as was observed during the nutrition baseline study carried out by UGAN in May 2014.

Objectives of the module

After having completed this module, participants should be able to:

- Differentiate between food, nutrients and nutrition
- Understand the classification of food into different food groups
- Name the nutrients and discuss their importance in the body
- List the primary food sources for each of the nutrients
- Understand what constitutes an adequate diet and optimal feeding to children
- Understand what is food and nutrition security and how it can be achieved

Overview

Part 1: Food, Nutrition and Nutrients
Part 2: Balanced Diet and Child Feeding
Part 3: Food and Nutrition Security
Food and nutrition security situation on tea estates in Western Uganda

In May 2014 UGAN interviewed 125 workers from 3 estates in Western Uganda (as part of the baseline survey) and found that most tea workers and their families did not achieve food and nutrition security. The diets consumed by the workers were not diverse: most households ate only 3 out of 15 food groups. People mostly ate legumes (beans), cereals (maize, rice, millet) and tubers (sweet potatoes, cassava and Irish potatoes). There was very little consumption of other vegetables, fruits, fats and foods of animal origin (such as meat, fish, poultry and milk). The predominant diets were found to be nutritionally inadequate for workers.

Different factors were found to influence the foods chosen by the workers, including: income, food prices, types of food available, individual food preferences, cultural background and land availability. The fact that estate policies do not allow estate workers to domesticate birds and animals was also found to have a direct effect on the food and nutrition security of the workers. If they were given the chance to rear fowls and animals then these could act as affordable/cheap sources of animal protein for individual households.

With regards to food access; the majority of households purchased their food and very few workers grew (at least some of) their own food. Several factors influenced the purchase of foods, including: respondents’ financial resources, food prices, availability of transport to and from the market, availability of food in the market and distance from the market. Workers who did grow some crops mostly grew tubers/roots, legumes and nuts. Only a small percentage of workers also grew cereals, vegetables and fruits.

Factors that were mentioned as affecting crop production included: limited access to land, climate, the time it takes to grow food, soil fertility and lack of confidence in the yield that would be produced. When unable to access adequate food supplies, the majority of workers said that they coped by borrowing food from friends/ neighbours. Other coping measures included: getting food on credit, eating less or going hungry and eating any available foods.
1.1. FOOD, NUTRITION AND NUTRIENTS

We often hear the terms food, nutrition and nutrients. Health workers advise us to have a diverse and nutrient-rich diet if we are to be healthy. But what are nutrients and what is nutrition?

**Food**
Food is defined as any substance containing nutrients (such as carbohydrates, proteins, and fats) that can be ingested by a living organism and metabolized into energy and body tissue. In essence, food stimulates growth, helps us to stay alive and produces energy.

**Nutrients**
Nutrients are the chemical substances found in food. They are extracted from food as it passes through our digestive system and are used by the body to perform its functions. Nutrients contained in food are needed in the right amounts and combinations for the body to function properly.

Nutrients are divided into two broad categories: MACRO nutrients and MICRO nutrients.

- Macronutrients are required by the body in large amounts; they include carbohydrates, proteins and fat.
- Micronutrients are required in relatively smaller amounts by the body; they include vitamins and minerals.

The body needs a mixture of both macro and micro nutrients for it to be healthy and function optimally. We access these nutrients through eating food.

**Nutrition**
The term ‘nutrition’ broadly covers all processes through which we obtain, prepare and eat food. It further describes what different foods are made of (i.e. nutrients) and the processes through which our bodies make use of the nutrients to enable us to perform daily activities such as work.

Apart from focussing on what we should eat, nutrition is also concerned with promoting aspects of personal and environmental hygiene and sanitation, promoting health seeking behaviours and providing care for all household members so that they are healthy.

**Classification of foods on the basis of the key nutrients they supply**
Different foods can be grouped into different groups depending on the major nutrients they provide. According to this classification there are:

- Energy giving foods/GO foods
- Body building foods/GROW foods
- Protective foods/GLOW foods
- Water (sits outside of the classification but is mentioned here as it is also essential for the human body to function properly)
Most foods provide more than one nutrient. Many energy giving foods are also sources of proteins and micronutrients, while many body building foods also provide energy and micronutrients.

ENERGY GIVING FOODS OR GO FOODS

Energy giving foods provide the energy needed by our bodies to:

• Perform activities such as walking, digging, working
• Maintain normal physiological processes such as breathing and all other processes within our bodies

Energy giving foods are mainly rich in the food nutrients carbohydrates or fats.

We obtain carbohydrates through eating plant-based foods. The main examples of carbohydrate containing foods include: millet, Irish potatoes, sweet potatoes, cassava, posho (made from maize or other flour), sorghum, yams, rice, plantain (matooke) and bread.

**Fats and oils** are usually solid, semi-solids or liquid depending on their chemical composition and environmental temperatures. Examples of fats and oils commonly consumed in our diets include liquid oils (sunflower oil, mukwano oil), ghee, suet (fat normally found on kidney and meat of cattle and sheep).

Apart from being good sources of energy, fats and oils also add flavour and taste to food. They further insulate the body, cushion vital organs and are **essential for the absorption and utilisation of fat-soluble vitamins A, D, E and K**. Thus, a very low consumption of fats and oils may lead to a deficiency of these vitamins predisposing our bodies to diseases and/or symptoms associated with a lack of these vitamins. The benefits of vitamins will be discussed later in this session.

When a person consumes excessive amounts of energy giving foods and doesn’t utilise this energy through physical activity, this results in surplus energy being converted and stored by the body as excess fat. This puts affected individuals at risk of developing coronary heart disease, high blood pressure and certain types of cancers.

The baseline assessment revealed that **tea estate workers and their families eat very little fats and oils**. If they were to eat more fats and oils, they might have more energy and, in combination with eating foods rich in certain vitamins, their bodies would absorb these vitamins better.
BODY BUILDING FOODS OR GROW FOODS

Body building foods or GROW foods are those rich in the food nutrients called **proteins**. They are essential for growth, boosting body immunity against infections and diseases, the formation of all tissues, including muscles, bones, teeth, skin and nails and for wound repair.

Bodybuilding foods come from **two major sources**:

2. **Plant-based** foods and related products: mainly beans (incl soy beans) and peas

Animal-based foods provide a richer source of proteins that are more easily utilised by the body than those supplied by plant-based foods. We can increase household intake of animal-based proteins by domesticating certain animals and birds. The birds (hens, ducks) can be eaten but also lay eggs, which are a rich source of proteins. Animals like rabbits are also relatively easy to rear: they do not require much space to be kept, are not too demanding in as far as feeding is concerned and have high multiplication rates.

The quality of proteins from plant-based foods can be improved by eating a combination of different such foods, e.g. rice and beans. The proteins missing in beans are present in rice so when these are eaten in combination one can also obtain a good supply of proteins for the body. **It is therefore important to eat a mixture of plant-based foods in our diets and even more so if access to animal-based foods is limited.**

We have different protein requirements at different ages: children require more protein-rich foods than adults because they are growing. Pregnant women should also eat plenty of protein-rich foods because they need to feed themselves as well as their growing baby. The same is true for lactating / breastfeeding mothers whose bodies need to be able to produce breast milk.
Examples of locally available plant-based foods rich in proteins:

- Ground nuts
- Simsim (Sesame) seeds
- Soy (soya)
- Beans

Examples of locally available animal-based foods rich in proteins:

- Meat, fish, eggs, milk and milk products including yoghurt and fermented milk
- Others include edible insects such as grasshoppers (nserene) and white ants (enswa)
PROTECTIVE FOODS OR GLOW FOODS

Protective or GLOW foods include vegetables and fruits. These foods are rich in vitamins and minerals which are required by the body for physiological functions such as the strengthening of the immune/defence system and to prevent conditions such as anaemia (resulting from iron deficiency), night blindness (resulting from Vitamin A deficiency), goitre (resulting from iodine deficiency) and rickets (resulting from a lack of Vitamin D and calcium). Some vitamins and minerals are also essential for the production of energy by the body and maintaining water balance in the body.

Vegetables
Vegetables are a rich source of several vitamins and minerals. In addition, vegetables add taste, flavour and colour to our meals. Common vegetables include: amaranthus (dodo), spinach, kale (sukumawiki), pumpkin leaves, cowpea leaves, carrots, cassava leaves, green pepper, nnakati, malakwang, eboo.

Fruits
A variety of fruits are grown and are accessible in the markets of Western Uganda, including avocados, mangoes, pawpaws, pumpkin, passion fruit, pineapple, jackfruit, oranges, lemons and other citrus fruits. The deep yellow or orange coloured fruits are richer in vitamins, particularly vitamin A.
### Table 1: Examples of vitamins and minerals, their functions and food sources

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Function</th>
<th>Food sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A</td>
<td>Strengthens our immunity which helps us fight off infections Improves vision in dim light Keeps the skin and the linings of some parts of the body, such as the nose, healthy</td>
<td>Dark green leafy vegetables such as spinach, broccoli and carrots. But also: pumpkin, liver, fish, kidney and dairy produce such as yoghurt, eggs, fortified margarine</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Helps the body absorb calcium Keeps bones and teeth healthy</td>
<td>Sun light, fish liver oils, milk, fortified margarine, eggs, liver</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>Helps maintain cell structure by protecting cell membranes</td>
<td>Soya, groundnuts, fortified margarine or oil, wholegrain cereals, eggs, peanut butter, tomatoes</td>
</tr>
<tr>
<td>Vitamin K</td>
<td>Helps with blood clotting</td>
<td>Vegetables such as spinach, lettuce, cauliflower, and cabbage, broccoli, fish, liver, meat, eggs</td>
</tr>
<tr>
<td>Bgroup Vitamins</td>
<td>Help the body release energy from food Keep the skin, eyes and the nervous system healthy</td>
<td>Millet, sorghum, beans, peas, eggs, liver, meat, milk, fresh fruit, green leafy vegetables, wholegrain cereals</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Helps with wound healing Strengthens our immunity which helps us fight off infections</td>
<td>Citrus fruits such as oranges, lemons and tangerines, red and green peppers, tomatoes, broccoli, potatoes</td>
</tr>
<tr>
<td>Folic acid</td>
<td>Helps form healthy red blood cells Helps reduce the risk of central nervous system defects such as spina bifida in unborn babies</td>
<td>Leafy green vegetables such as spinach, broccoli, and lettuce, liver, beans, peas, fruits such as oranges, bananas, avocados and melons</td>
</tr>
<tr>
<td>Iron</td>
<td>Helps make red blood cells, which carry oxygen around the body</td>
<td>Liver, meat, offal, beans, millet, sorghum, ground nuts, eggs, most dark green leafy vegetables such as amaranthus and parsley</td>
</tr>
<tr>
<td>Calcium</td>
<td>Helps build strong bones and teeth Helps muscles and nerves function normally Helps to ensure blood clots normally</td>
<td>Milk, cheese and other dairy foods, green leafy vegetables, such as cabbage and okra</td>
</tr>
<tr>
<td>Iodine</td>
<td>Helps to regulate the thyroid gland (in the neck) which controls the development of the body, including the brain, and regulates physiological processes (or metabolism).</td>
<td>Iodized salt, sea food</td>
</tr>
</tbody>
</table>

Vegetables and fruits are a major source of vitamins and minerals which are required by our brain, eyes, muscles, bones, blood, glands, etc to perform all the functions for which they are designed.
Key vitamins and minerals for children and pregnant/breastfeeding women:

- **Iron**: Iron deficiency is a major cause of anaemia and impairs the child's/baby's cognitive and physical development.
- **Iodine**: Iodine deficiency is the greatest single cause of mental retardation and brain damage.
- **Vitamin A**: Vitamin A deficiency causes early childhood blindness and increases the severity of infections and anaemia, in both children and pregnant/breastfeeding women.
- **Zinc**: Zinc deficiency affects children’s health and physical growth; it is also essential for mothers during pregnancy.

**WATER**

Water is essential for the human body to function properly. As the body cannot store water, it requires fresh supplies of safe, clean water every day. The amount a person needs to drink depends on a variety of factors such as environmental temperature and activity level. E.g. if you work hard in hot weather you may need to drink more. All drinks such as tea, coffee, fruit juice count towards the recommended daily total of at least 8 cups a day (for an adult).

The body requires water for many reasons:

- To transport nutrients around the body
- To make blood, saliva, tears and sweat
- To enable body processes such as digestion
- To keep the mouth and lungs moist, and to keep the skin moist and cool
- To produce breast milk, which is also a source of water for breastfeeding children
1.2. BALANCED DIET AND CHILD FEEDING

In part 1, we looked at ‘what’ our bodies need to be healthy. Here we will look at ‘how much’ we need of each of the foods – this is being referred to as ‘adequate nutrition’. A diet that is able to provide all the recommended (adequate) amounts of nutrients in the right amounts and quality for the body to perform all its physical and physiological activities depending on one’s age, sex and physical activity level is called a ‘balanced diet’.

This implies that all the main food types (carbohydrates, fats, proteins, vitamins, minerals, and water) are eaten in correct proportions throughout the daily life of an individual.

Balanced diets benefit individuals, families, communities and the nation at large. It is especially important for the following categories of people to have a balanced diet:

**Pregnant women**
- Their food intake will need to support themselves as well as their growing foetus
- Pregnant women will therefore need more nutrients than non-pregnant women
- The foetus/baby (inside the woman’s womb) needs a wide variety of nutrients in order to grow well and be physically and mentally healthy, e.g. folic acid and iron

**Breastfeeding/lactating women**
- Lactating mothers need enough nutrients so that they have enough energy to go about their daily lives as well as produce breast milk
- Maternal nutrition has only a minor effect on the composition and quantity of breast milk produced. Unless a mother is severely malnourished, her milk will be fine
- Mothers whose diets are poor deplete their own energy levels, and may become anaemic, but their bodies will continue to produce the milk their baby needs by pulling from the mother’s energy stores (at her expense but not her baby’s expense)

**Babies (up to 6 months)**
- They need to be breastfed. Breast milk contains all the nutrients a baby needs

**Children**
- They are growing and developing (physically and mentally) and therefore have extra nutritional needs to be able to do so
- They are meant to gain body weight and height. If children are under-nourished they risk ‘wasting’ or being ‘stunted’
- The first 1,000 days in a child’s life (starts at conception and until 2 years of age) are crucial. Any damage to their growth (physically and mentally) in these 1,000 days through a lack of nutrients is irreversible
- A child with an adequate diet has a stronger immune system (than an under-nourished child) and this helps him/her fight off illnesses

**People with chronic (long-term) illnesses (e.g. HIV/AIDS)**
- They will better respond to treatment
- Adequate nutrition will affect the immune system and help them fight off other diseases

The key to a balanced diet is to consume a variety of foods in their right amounts
Generally speaking, in order to maintain/attain a balanced diet, we should eat:

- **Starchy foods**, such as millet, rice, potatoes, cassava, matooke. Starchy foods should make up around one third of everything we eat.
- **Fruits and vegetables**. They are a vital source of vitamins and minerals. We should try to eat a variety of fruit and vegetables each day, ideally 5 portions in total (e.g. 3 types of vegetables and 2 fruits).
- **Meat, fish, eggs, beans, nuts and seeds**. These foods are all good sources of protein, vitamins and minerals.
- **Milk and dairy foods**: Milk and dairy foods such as fortified yoghurt are good sources of protein, vitamins A, D, and B group vitamins and the mineral calcium.
- **Moderate amount of food high in fat and/or sugar**. Fats and sugar are both sources of energy for the body. In addition, fats help transport fat soluble vitamins. Health recommendations stipulate a modest intake of fat and sugar. An excess of these foods can lead to being overweight or obese as well as the development of other diseases like diabetes and heart disease. Given the high energy requirements for estate tea workers, restrictions on fat and sugar intake are likely to be unnecessary.

As shown in the pyramid below, it is important to eat a variety of foods. As a general rule, we should consume less of the foods that are in the tip of the pyramid and more of the foods that are lower down. **For a healthy diet, a minimum of 5 food groups have to be eaten every day.**
Table 2: Common myths and facts about a balanced diet / adequate nutrition

<table>
<thead>
<tr>
<th>Myths</th>
<th>Fact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate nutrition means eating chicken, fish and meat. This is expensive and therefore unaffordable.</td>
<td>Adequate nutrition is eating all the three main food types (energy giving foods, body building foods and protective foods) in correct proportions. Your diet does not have to be expensive for it to be healthy.</td>
</tr>
<tr>
<td>Fruits are eaten by children and poor people only</td>
<td>Fruits and vegetables should be eaten by all, irrespective of age, sex and income category. They are a good source of vitamins and minerals which are essential for our bodies to perform their functions.</td>
</tr>
</tbody>
</table>

One day sample menu for an adult (3000 kcal)

The number of meals (a meal is a selection of foods prepared and served in a single serving as breakfast, lunch, or supper) an individual should eat in a day varies with age, sex, physiological status, and physical activity level. Children eat smaller food portions because their stomachs are smaller and so require more frequent feeding compared to adults. While adults can do with three meals a day, children below five years need five meals a day because of their increased nutrient requirements for growth and development.

Table 3: One day sample menu for an adult

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>Lunch</th>
<th>Supper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize meal porridge with milk and sugar (1 cup/250ml)</td>
<td>Bean/peas/fish/meatstew (2 handfuls) with a teaspoon of ghee Millet bread and cassava / matooke / sweet potatoes/ yams / Irish potatoes / rice / maize (2/4 of the plate)</td>
<td>Groundnut/bean/peas/fish/meat stew (2 handfuls)</td>
</tr>
<tr>
<td>2 slices of bread</td>
<td>Amaranthus (dodo) / cassava leaves / cabbage / spinach / avocado(1 handful / 90g)</td>
<td>Matooke and sweet potatoes / yams / Irish potatoes / rice / maize (1/4 of the plate)</td>
</tr>
<tr>
<td>Yellow banana</td>
<td>A slice of mango/banana / pawpaw / jack fruit</td>
<td>Cabbage / cassava leaves / cabbage / spinach / avocado(1 handful / 90g)</td>
</tr>
<tr>
<td>Tea (1 cup)</td>
<td>Boiled water (1 glass)</td>
<td>Fresh (passion) juice (1 glass)</td>
</tr>
</tbody>
</table>
1.3. FOOD AND NUTRITION SECURITY

At the start of the module we defined the terms ‘food’ and ‘nutrition’ and further highlighted how these relate to our health. This session adds the term ‘security’ to food and nutrition and explains the inter-relationship and difference between food security and nutrition security. We also observed in the introduction that tea estate workers were not food and nutrient secure as they did not eat adequately (only 3 out of 15 food groups).

What is food security?

When food security is achieved this means that: “Each person has (physical and economic) access at all times to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.”

In other words, to be ‘food secure’ at individual, household, village, or community level, food should be:

Available: refers to the physical presence of food, be it from own production or from the market or shops

Accessible: refers to households and all individuals within those households having sufficient resources such as money, labour, time and knowledge to obtain appropriate foods for a nutritious diet

Utilizable: Individuals should be able to eat and absorb in their bodies the available and accessible food. There should be no diseases or ailments like diarrhoea, malaria, worm infestation that limit individuals from benefiting from the eaten food

Sustainable: Individuals should feel confident that they will have enough food to feed their family tomorrow, the next week, month and year. Food should therefore be available, accessible and utilizable at all times

What is nutrition security?

Sustainable access to food does not necessarily mean that all household or community members will be healthy. There are other factors in addition to food security that help ensure the achievement of individual, household and community health:

• There is a need to provide adequate care for the young, the sick, the elderly, the physically handicapped and all other household members. Care can mean ensuring that all individuals have eaten according to their needs, that those who are sick are treated, and that women are supported to exclusively breastfeed their children for the first 6 months

• There is also the need to adequately prevent and control diseases so that foods eaten can be used by our bodies. This necessitates having measures in place which prevent, control and treat any diseases. Such measures can include: maintaining environmental hygiene and sanitation, taking children for immunisation, attending antenatal clinics by pregnant mothers, seeking medical treatment for any infections, deworming children and all other household members.
From the above, we observe that three conditions must be fulfilled if all individuals are to be healthy: **food security**, **adequate care** and **adequate prevention and control of diseases**. It is only when these conditions are fulfilled that a household or community can be nutrient secure.

Nutrient security is more than food security. Individuals, households and communities can only attain good health and nutrition if the three conditions of nutrient security; **food security**, **adequate care**, and **adequate prevention and control of diseases** are achieved.

**How can food and nutrition security be improved on the tea estates?**

In order to achieve food and nutrition security among tea estate workers, the underlying factors holding individuals back from accessing and utilising food, providing care for household members and seeking treatment for all ailments would need to be addressed.

The challenges will need to be addressed at different levels; at household level as well as at estate management level.

**Actions that can be taken by the workers / households:**

- Development of household and community gardens so that a wide variety of fruits and vegetables can be grown. The following nutritious foods can be grown: beans, peas, ground nuts and various kinds of green leafy vegetables such as amaranthus (*dodo*), spinach, kale (*sukuma wiki*), cabbages, as well as red/orange/yellow coloured vegetables such as chilli peppers (*habanero*), carrots, tomatoes. Fruit trees can be planted and yield lemons, oranges, mangoes, avocados, pineapples, passion fruit, etc.
- Constructing food stores such as granaries to preserve surplus food and provide food in times of scarcity.
- Household domestication of birds and animals (rabbits, cows, goats, chicken, ducks, etc.) can provide milk, ghee, meat and increase household income through selling some of the products.
- Preserving and basic processing of food, through methods such as solar drying or fermentation which can improve the nutrient content of some foods and increase the availability of seasonal foods (e.g. mangoes, tomatoes, cabbage).
- Practicing exclusive breastfeeding for children below 6 months and giving those 6-24 months nutrient-rich foods 4-5 times a day, in addition to breast feeding.

**Actions that can be taken by the estate management:**

- Allowing workers to grow food in the labour lines and possibly, on other idle land on the estate (e.g. on some estates in India, workers are allowed to grow rice).
- Using idle estate land for growing fruit trees, e.g. citrus fruits (rich in Vitamin C), avocados or mangoes and distributing this among the workers.
- Allowing workers to construct food stores and/or develop communal food storage facilities.
- Allowing the workers to keep livestock in a way that is manageable for the estate (it works in other countries like India where estate workers have cows and chickens). It would enable relatively cheap access to animal-based proteins.
- Better equipped health facilities and more health-focused campaigns / sensitisation among the workers, e.g. on breast feeding and child feeding.
- Arranging transport to local markets.
• Buying food products in bulk and selling it on to the workers who will then benefit from economies of scale (e.g. cooking oil, rice, fruits, …)
• Providing nutrition, cooking and food preservation lessons
• Promoting economic activities through which households can obtain extra income that can then be used to purchase food

How to ensure adequate care for all household members
• Effectively using the available resources to ensure that food is available to all household members
• Attending to all household members who are sick
• Nurturing the physical and social development of children (e.g. allowing children to play and socialise)
• Promoting general family happiness where all members can freely interact and eat food as a family (i.e. controlling violence in a household and/or community)

How to prevent and control diseases
• Promoting individual, household and community hygiene
• Ensuring that all children are immunised according to recommended health schedules
• Effective treatment of infections, e.g. diarrhoea, malaria, worm infestations, etc.
• Improving health seeking behaviours such as women seeking antenatal care during pregnancy, women giving birth at health facilities, individuals going for regular medical check-ups and seeking early treatment for illnesses
**SUMMARY MODULE 1: FOOD & NUTRITION SECURITY**

We need a **Balanced Diet** to stay healthy. Children also need it to grow well, both physically and mentally. Eating a diverse diet means eating many **different foods** each day so that we consume lots of different nutrients. These nutrients keep us healthy in different ways: e.g. iron helps the body make red blood cells (which carry around oxygen and therefore give us energy), vitamin C helps fight off illnesses and protein is the body's primary building block for muscles, bones, skin and hair. Most foods provide more than one nutrient. We need to eat all of the following in the right amounts:

<table>
<thead>
<tr>
<th>TYPES OF NUTRIENTS</th>
<th>FOODS THAT CONTAIN THESE NUTRIENTS</th>
<th>BENEFITS OF THESE NUTRIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROTEINS</strong></td>
<td>Animal-based: fish, meat (includes poultry), eggs, milk, yoghurt, grasshoppers (<em>nsenene</em>) and white ants (<em>enswa</em>)&lt;br&gt;Plant-based: beans (incl soy beans) peas, nuts, seeds</td>
<td><strong>BUILD AND REPAIR OUR BODIES</strong></td>
</tr>
<tr>
<td><strong>CARBOHYDRATES</strong></td>
<td>Millet, Irish potatoes, sweet potatoes, cassava, posho, sorghum, yams, rice, plantain (<em>matooke</em>) and bread</td>
<td><strong>GIVE US ENERGY</strong></td>
</tr>
<tr>
<td><strong>FATS</strong></td>
<td>Sunflower oil, mukwano oil ghee, suet</td>
<td><strong>GIVE US ENERGY</strong></td>
</tr>
<tr>
<td><strong>VITAMINS &amp; MINERALS</strong></td>
<td>FRUITS: mango, orange, pineapple, avocado,….&lt;br&gt;VEGETABLES: amaranthus (<em>dodo</em>), spinach, kale (<em>sukumawiki</em>), pumpkin leaves, cowpea leaves, carrots, cassava leaves, green pepper, <em>nnakati, malakwang, eboo</em>, green beans, tomato, sweet potato</td>
<td><strong>PROTECT AGAIN ILLNESS&lt;br&gt;HELP PRODUCE ENERGY&lt;br&gt;MAINTAIN WATER BALANCE</strong></td>
</tr>
<tr>
<td></td>
<td>CLEAN WATER and other drinks</td>
<td><strong>HYDRATION</strong></td>
</tr>
</tbody>
</table>

Nutritious diets do not have to be expensive; key is to consume a variety of locally available/grown food on a daily basis.
It is especially important for the following categories of people to have a balanced diet:

- Pregnant and breastfeeding/lactating women
- Babies (up to 6 months)
- Children
- People with chronic (long-term) illnesses (e.g. HIV/AIDS)

**Key vitamins and minerals for children and pregnant/breastfeeding women:**

- **Iron**: Helps make red blood cells, which carry oxygen around the body. Iron deficiency is a major cause of anaemia and impairs a child’s cognitive and physical development.
- **Iodine**: Helps to regulate the thyroid gland (in the neck) which controls the development of the body, including the brain, and regulates physiological processes (or metabolism). Iodine deficiency is the greatest single cause of mental retardation and brain damage.
- **Vitamin A**: Strengthens our immunity which helps us fight off infections. Improves vision in dim light. Keeps the skin and the linings of some parts of the body healthy. Vitamin A deficiency causes early childhood blindness and increases the severity of infections and anaemia, in both children and pregnant/breastfeeding women.
- **Zinc**: Supports the immune system, promotes healthy growth during childhood, and heals wounds. Zinc deficiency affects children’s health and physical growth.

**The food pyramid**: All of these types of food should be eaten but the foods at the bottom should be eaten most and those at the top more sparingly. *For a healthy diet, a minimum of 5 food groups need to be eaten every day.*