

# Part I

## Family Foods and Complementary Feeding

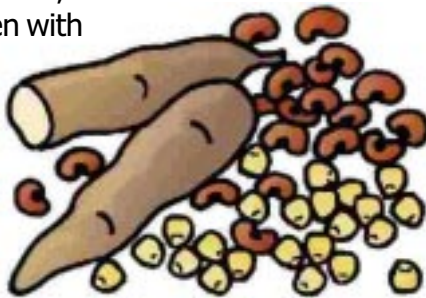
Families in Luapula Province enjoy eating many different foods during the year. The more variety they have in the foods they eat at all times during the year, the better their chances will be of meeting the nutritional needs of different family members.

Children from 6 to 24 months of age need plenty of good food often, in addition to breastmilk . Good nutrition and care during the first two years of life are essential for lifelong health and well-being.

### The main family dish

Main family meals usually consist of the main dish and a relish. Foods such as cassava and maize are used for preparing the main dish and they are called "staple foods". Staple foods are generally readily available and provide most of the **energy or strength** people need to work, walk, run, jump, breathe, learn and play. They also provide the energy that children need to grow up.

Maize flour provides a lot of energy and some protein, but this is not enough for maintaining the body. Like maize flour, cassava is a good source of energy, but it has very little protein and virtually no vitamins and minerals. For this reason, both maize and cassava dishes must be eaten with other foods such as groundnuts, beans, fish and meat. This increases the total amount of protein in the meal and provides vitamin and minerals. All the nutrients are important to ensure that children grow and develop well.



Fortunately, in most parts of Zambia, the main family dishes are usually eaten with a variety of relishes made from at least 3 or more of the following foods:

- fish;
- beans;
- green leafy vegetables with pounded groundnuts;
- chicken, eggs, or meat;
- cooking oil for making the relish tasty and for giving additional energy; and
- salt for adding more taste.

## Relish

Each relish ingredient contains its own individual mixture of energy, proteins, vitamins and minerals. As there is no single food, other than breastmilk, that contains all the nutrients needed



for human growth and development and protection from infection, it is essential that children from 6 months onwards eat many different foods daily. Staple foods such as maize and cassava

provide the energy for children to grow.

Beans, groundnuts, fish and meat provide a lot of protein for child growth and repairing damaged tissue. After their uptake by the body, the proteins are converted into tissue and muscle cells that make up the bulk of human flesh.

Foods such as small fish eaten whole, meat, amaranthus, cowpea leaves and cassava leaves provide minerals (iron, zinc, calcium) that the body needs to make healthy bones, teeth and strong blood.

Fruits and vegetables are also very important for staying healthy. They contain vitamins (especially vitamins A, C and B) and minerals that help the body function properly; they are also important for growth and help the body fight off infections.

There are many different types of fruits and vegetables that are locally available, especially during the rainy season. Fruits that are readily available and good to eat are: mango, guava, pawpaw, orange, banana, masuku and many other local fruits. Green leafy vegetables such as pumpkin, sweet potato, bean and cowpea leaves, amaranthus, rape and many others are plentiful, especially during the rains. Green leafy vegetables, tomatoes and fruits can also be dried when in season and eaten at times of the year when fresh fruits and vegetables are in short supply. Dried mango or guava are excellent snack foods for children.

Children should eat 3 or more different kinds of fruits and/or vegetables daily. For example, mashed pawpaw can be added to the child's porridge in the morning, followed by porridge mixed with shredded green leafy vegetables and groundnuts at lunch; and another vegetable or fruit (mashed banana or shredded pumpkin leaves) can be added to the child's porridge in the evening.

The size or amount of an individual fruit or portion of vegetable relish to be eaten should be equal to the amount that can fit into a child's hand, that means, the bigger the child, the larger the amount to be eaten.

Adding a small spoonful of red palm oil to all vegetable relish dishes is very good and gives added nutritional value and taste.

## **Importance of eating variety in each meal**

Children should eat different foods in each meal, consisting of the staple food (i.e. maize or cassava nshima) plus a tasty relish that should contain at least 3 to 5 different ingredients (e.g. green leafy vegetables prepared with tomato and groundnuts and a little oil). This will ensure that children get enough energy, protein, vitamins and minerals to ensure they grow well and stay healthy.



## Feeding infants and young children

Small children grow very fast and they are physically active. They therefore need a good combination of the main family dish and other foods that are used to make relishes (beans, groundnuts, fish, eggs, meat, leafy vegetables, cooking oil, etc). This will ensure that they get sufficient energy and nutrients for growth, development and protection from infection.



Fats and oils, for example, palm oil or vegetable oil, such as sunflower, groundnut, soybean or corn oil, provide energy in a very concentrated form and are particularly useful for increasing the energy content of young children's meals without increasing the bulk (volume or size) of the meals. This is important as children under two years of age have small stomachs and can eat only small amounts of food at each meal. In addition, they must be fed regularly during the course of the day.

If the child is well fed, he/she will be happier and is likely to cry less. The child remains healthy, will not be sick often and the mother will have more time for household chores and other duties.



## Breastfeeding

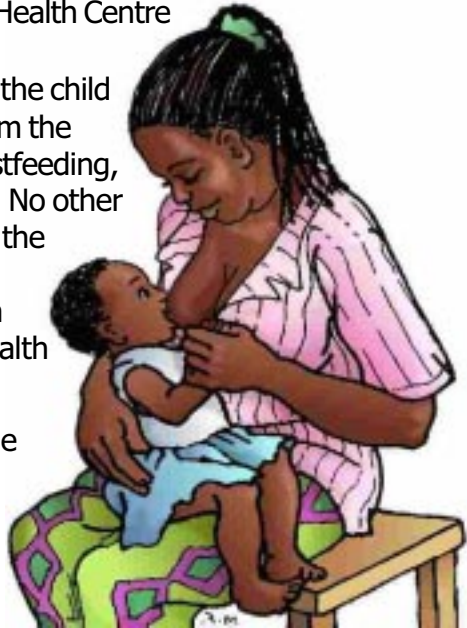
Breastmilk is the best food for babies from birth up to the age of 6 months. It is clean and safe, protects the child from diseases, contains the energy and nutrients that the child needs to grow and develop and it is ready to drink. Breastmilk contributes significant amounts of energy and nutrients even after 6 months. Mothers should be encouraged to breastfeed for 2 years or beyond.

## HIV/AIDS and breastfeeding

HIV can be passed from mother to infant through breastfeeding. Mothers should be advised to get tested for HIV before or during pregnancy so that they can decide how to feed their child.

If it is confirmed that a woman is HIV-positive, she should obtain information from her nearest Health Centre on the risks and benefits of:

- Exclusive breastfeeding, i.e. the child receives breastmilk only from the mother through direct breastfeeding, or expression of breastmilk. No other liquids or solids are given to the baby. This means that medications should be given only as prescribed at the health facility.
- Replacement feeding, i.e. the mother decides not to breastfeed but to give the child a suitable breastmilk substitute, such as commercial infant formula.



*Breastmilk is best for the baby during the first 6 months of life*

If the mother decides to breastfeed, there is a risk of passing HIV to the baby, but the risk can be reduced if:

- she gives no food or drinks to the child other than breastmilk;
- her nipples are not cracked and she is not clinically ill with HIV;
- the baby does not have sores or thrush in the mouth.

If the mother decides not to breastfeed but opts for replacement feeding, there is no risk of passing HIV to the baby.



However, there is a high risk that the child may get sick with diarrhoea and other infections. This is because replacement feeds do not contain the protective factors, and before 6 months of life the infant's digestive system is not mature enough. In addition, incorrect storage and preparation of infant formula can lead to sickness, especially if:



- feeds are prepared with dirty water
- feeds are diluted with too much or too little water
- feeding utensils are not properly cleaned.



In situations where mothers do not have easy access to clean water, do not live in a hygienic environment and lack information and support on the safe preparation of feeds, the use of infant formula is not recommended.

Feeding both breastmilk and infant formula, or other foods and liquids, i.e. mixed feeding, carries a much higher risk of passing HIV from mother to the child, than breastfeeding only. Mixed feeding should be discouraged.

As part of services provided for the prevention of mother-to-child transmission (PMTCT) of HIV, health facilities should provide counselling and help HIV-positive mothers decide which will be the most suitable method of infant feeding. They should also support mothers in their chosen method. This process should be done individually to mothers who have tested HIV-positive and have collected their results.

If the mother decides not to breastfeed, the health worker should:

- check that the family has the resources (cash for breastmilk substitutes, utensils, fuel) and skills for making and giving replacement feeds;
- show the mother how to prepare feeds and how to feed with a cup;
- emphasize the need for good hygiene and for diluting the milk correctly;

- watch the mother prepare and give a feed and correct any mistakes. Try to do this in her own home using her own equipment.

It is also important that health workers demonstrate to the mother the infant feeding method that she chooses. This also applies to women who chose to breastfeed exclusively.

If an infant is tested for HIV, the mother will also require counseling and support at that time, irrespective of whether the infant is HIV-positive.

For all HIV-negative women and those of unknown status, breastfeeding should be promoted. The group education sessions should not include information on infant feeding options as this might influence mothers who should not stop breastfeeding.

## Complementary feeding

From the age of 6 months, breastmilk starts to be insufficient and the child requires complementary foods, i.e., foods in addition to breastmilk.



The mother should therefore continue to breastfeed, while giving the child foods such as porridge, mashed fruits like bananas, mangoes, pawpaws, and fruit juices, finely chopped or shredded green leafy vegetables, mashed beans, crushed



*One year old eating pumpkin and avocado mash*

groundnuts and sunflower seeds, fish and other animal foods. A medium size mango or yellow sweet potato or 3 tablespoons of shredded green vegetables such as pumpkin leaves or amaranthus a day, are enough to make the child see well at night.

If the mother is HIV-positive, the change-over period from exclusive breastfeeding to replacement feeding should not last longer than 3 weeks. This reduces the risk of the child being infected by HIV during the change-over period. During this period, the mother can consider other breast-milk options such as expressing and heat-treating breastmilk and feeding the baby by cup. Heat-treating milk destroys the HIV.

Once the baby no longer receives breast milk, he/she must be given extra liquid and food every day in addition to the amounts of complementary foods recommend (see Table 1, Part II). He/she should be given an extra amount of 250 ml of milk – a little more than one cup of, for example, boiled cow's or goat's milk, and 1 or 2 extra meals, including as much food from animals as possible (i.e. foods from milk, eggs, meat, liver, poultry and fish).



## Part II

### Local Measures and Useful Hints

The local measures used in recipe development include cups, tablespoons, teaspoons and a two-finger pinch. Sizes of cups used in different areas vary from the 150 ml to 500 ml, depending on whether the mother opted to:

- bulk prepare and premix the porridge ingredients; or
- prepare porridge for more than one child, which is often the case.



Where the mother is preparing one feed for one child, she is advised to use a tablespoon. Hence the information given below focuses on the proportions to use and the mother may opt for either a cup or tablespoon to measure the cooking ingredients, depending on whether she is bulk preparing the porridge mixture, preparing food for more than one child or preparing food for one child for one feed.

### Quantities of maize/cassava flour and groundnuts, beans or fish to use

- For 1 cup<sup>1</sup> of cassava or rice flour use ½ cup of groundnuts or beans or fish flour because cassava and rice have very little protein.

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<sup>1</sup> 1 cup = 200 ml

- For 1 cup of maize flour, use ¼ cup of groundnuts or beans or fish flour to enrich the child's food.

Where a tablespoon is used to measure quantities to cook, the amounts should be:

- **Cassava porridge:** 2 tablespoons of cassava flour to 1 tablespoon of beans or groundnuts or fish, and
- **Maize porridge:** 2 tablespoons of maize flour to ½ table-spoon of beans or groundnuts or fish.

## Differences between beans/fish and groundnut enriched porridges

- For 1 feed of cassava or maize porridge with beans or fish flour, add 1-2 teaspoons of palm oil or cooking oil because fish and beans do not contain oil.
- For 1 feed of cassava or maize porridge with groundnut flour, there is no need to add oil because groundnuts already have their own oil.

## Vegetables and fruits

Encourage mothers to add a teaspoon of shredded or pounded green leafy vegetables, e.g. pumpkin, sweet potato leaves, bean and cowpea leaves, amaranthus, rape or Chinese cabbage to each

feed they make for the child.



Vegetables and fruits are very important because they provide vitamins, i.e. Vitamin A, C and B (folate) and minerals. Mothers should be encouraged to give their children a

variety of vegetables and fruit every day. Fruits can be mashed and mixed with porridge or given as a snack between meals.



## Daily meal frequency and gradual introduction of new foods

The child has a small stomach and can only eat small quantities of food at one time. However, he/she is growing very fast and needs lots of energy, protein, vitamins and minerals in relation to his/her size. To make sure that the child gets enough food, he/she must be fed often (about 3 to 5 times a day) in addition to breastfeeding.

Advise the mother to give the child one new food at a time, starting with small quantities and gradually increasing the quantity over a 3 to 5-day period. As the child gets accustomed to eating a new food, the mother should add the next new food to the child's diet, starting with small quantities and gradually increasing them. Advise the mother to give a new food when the child is hungry and before giving breastmilk; this way the child is more likely to accept the food quickly.

## Get the children accustomed to foods (without spices) from the family pot

As the child grows (from 7 or 8 months onwards), encourage the mother to gradually give her baby soft or mashed foods from the main family pot. Always follow the basic rules of gradually introducing a new dish to the child's diet and make sure the child eats a mixture of foods that provide enough energy and other nutrients.

## Useful hints

Mothers can reduce their workload by bulk processing dry ingredients for making complementary food premixes. Processing larger quantities of food at one time means that mothers can have sufficient premix to feed the child for up to 2 weeks. The premixed

foods must be stored in a clean, safe container.

Depending on the age of the child and the recommended daily meal frequency of complementary food, 2-3 heaped tablespoons of flour can be used to prepare a meal for a 7-months-old child for instance and 5-6 tablespoons for a child aged 12-24 months. Table 1 below provides the details of the recommended number of daily meals and the quantities needed per meal by age group.

**Table 1: Proposed Daily Meals and Quantities for Breastfed Children by Age<sup>1</sup>**

<b>Age group of Child</b>	<b>Daily Meals of Complementary Food</b>	<b>Quantities of Flour for One Meal</b>	<b>Quantities of Cooked Food per Serving</b>
6-8 Months	2-3 meals per day plus frequent breast-feeding	start with 2-3 tablespoons (heaped)* and gradually increase to ½ to ¾ cup	½ to ¾ of cup
<p><b>Comment:</b> Start with fairly thick porridge and gradually increase thickness. Give well mashed family foods. Continue with mashed family foods.</p>			
9-12 Months	3-4 meals plus breastfeeds Depending on the child's appetite, 1 - 2 snacks may be offered between meals	3-4 tablespoons (heaped)	¾ to 1 cup
<p><b>Comment:</b> Thicker consistency. Finely chopped or mashed foods, and foods that baby can pick up.</p>			

<sup>1</sup> The energy, protein and fat requirements (RDA's) provided by these recipes are provided in Annex 2

If the baby is not breastfed, give 2 extra meals a day

12-24 Months	3–4 meals plus breastfeeds Depending on appetite, 1-2 snacks may be offered between meals	5-6 tablespoons (heaped)	1 to 1¼ cups (thicker consistency)
<p><b>Comment:</b> Thicker consistency. Family foods, chopped or mashed if necessary.</p>			

**NB:**

1 cup = 200 ml

1 table spoonful of flour = 10 grams of flour

3 tablespoonfuls of flour = 1/3 cup

Source: Table adapted from WHO, 2006. Infant and Young Child Feeding Counselling: An Integrated Course. *Trainer's Guide*. p. 417.

## Hygiene issues to observe

### Hand washing

- Mothers should ***always*** wash their hands with soap and water, before food preparation and before feeding the child
- They should wash them under running water as shown below



*Helping to wash hands*



*Washing hands without help*



*Washing 1<sup>st</sup> hand*



*Washing 2<sup>nd</sup> hand*

- It is important to ***always*** wash the child's hands with soap and water immediately before and after feeding
- Make sure the child doesn't play with or touch dirt during feeding

## Other important issues

The mother should:

- Store food and water in covered containers to protect it from dust and pests which carry germs
- Use clean utensils to prepare and serve food
- Use fresh or wholesome food
- Cover cooked food to stop flies from getting onto it
- Serve the food shortly after preparation





*Food covered to protect it from flies and other pests*





# Part III

## Recommended Complementary Food Recipes for the Early Dry Season (April to August)

Foods that are readily available during the early dry season include cassava, maize, rice (in some areas), pumpkins, sweet potatoes, beans, groundnuts, fish, a few indigenous vegetables and some exotic vegetables where dry season gardening is practised.



*Foods available to most households during the early dry season*

Recommended complementary feeding recipes include:

- Cassava and groundnut porridge
- Cassava and bean porridge
- Maize and groundnut porridge
- Maize and beans porridge
- Sweet potatoes and groundnut porridge
- Rice and groundnut porridge

If fish is available, the groundnut or beans flour can be replaced with fish flour (see Part II for the recipe). This way, the child will eat a wider range of diverse foods and this is good for his/her health.

## Cassava and groundnut porridge



### Ingredients:

- 1 cup cassava meal
- ½ cup pounded roasted groundnuts
- 2-4 teaspoons shredded/pounded green leafy vegetables
- 4 cups water
- 1 light two-finger pinch of salt<sup>1</sup>
- A little sugar to taste

- a. Mix cassava flour with pounded roasted groundnuts
- b. Boil 3 cups of the water
- c. Mix the remaining cup of water with the cassava flour-pounded groundnuts mixture and make a smooth paste
- d. Add the paste to the boiling water and mix well until smooth
- e. Add the pounded vegetables and cook for 3-4 minutes
- f. Add a little sugar and salt to taste and serve

<sup>1</sup> Four light two-finger pinches of salt are equivalent to 1 gram according to the community level trials undertaken in November 2004

### **When using pounded dried raw groundnuts:**

- a. Put 3 cups water and pounded groundnuts into the pot and bring them to boil
- b. Cook the mixture for 5 minutes
- c. Mix the remaining cup of cold water with the cassava flour and make a smooth paste
- d. Add the cassava flour and mix well
- e. Add the pounded vegetables and cook for 3-4 minutes
- f. Add a little sugar and salt to taste and serve

## **Cassava and bean flour porridge**

### **Ingredients:**

- 1 cup cassava meal
- ½ cup bean flour
- 2 teaspoons palm oil
- 4 cups water
- 1 light two-finger pinch of salt
- A little sugar to taste

- a. Put 3 cups water and bean flour into the pot, mix well and bring them to boil
- b. Cook the mixture for 20-25 minutes
- c. Add salt and sugar to taste
- d. Add palm oil
- e. Add the cassava flour, mix well and serve



### **Preparation of bean flour:**

#### **Option 1:**

- Put water in a pot and bring to boil
- Sort the beans and put them into the boiling water
- Cook the beans until soft enough to peel (30-40 minutes)
- Remove the outer skin (seed coat) and partially dry the beans
- Pound, sieve and dry the flour well

## **Option 2:**

If the mother's workload is heavy and there is adequate sunshine, she can do the following:

- Thoroughly dry or roast the beans on low heat;
- Pound the beans and remove as much of the outer skin as is possible
- Continue pounding the crushed beans into flour and sieve



**NB:** Cook the bean flour for 25-30 minutes before adding the cassava flour

## **Maize and groundnut porridge**



### **Ingredients:**

- 1 cup maize meal
- ¼ cup pounded roasted or unroasted groundnuts
- 2-4 teaspoons shredded/pounded green leafy vegetables
- 4 cups water
- 1 light two-finger pinch of salt
- A little sugar to taste

- a. Mix maize flour with pounded groundnuts
- b. Add water and mix into a smooth paste
- c. Cook the maize flour/pounded groundnuts mixture and stir constantly
- d. After reaching boiling point, cook for 15 minutes
- e. Add the pounded vegetables
- f. Add salt and sugar to taste



**NB:** The pounded groundnuts can be replaced with bean flour and palm oil. However the bean-enriched porridge must cook for 25-30 minutes.

## Sweet potato and groundnut porridge

### Ingredients:

1 cup sweet potato flour  
¼ cup pounded roasted groundnuts  
2-4 teaspoons shredded/pounded green leafy vegetables  
1 light two-finger pinch of salt  
2¼ cups water



- Mix sweet potato flour with roasted groundnut flour
- Put the mixture into a pot and add water
- Bring to boil while stirring
- Simmer for 15 minutes
- Add the pounded vegetables and cook for a few minutes

### Preparation of sweet potato flour

- Peel the sweet potatoes and wash
- Chip and dry
- Pound and sieve to get flour

## Rice and groundnut porridge



### Ingredients:

- 1 cup rice meal
- ½ cup pounded roasted or unroasted groundnuts
- 2-4 teaspoons shredded/ pounded green leafy vegetables
- 4 cups water
- 1 light two-finger pinch of salt
- A little sugar to taste

- a. Mix rice flour with pounded groundnuts
- b. Add water and mix into a smooth paste
- c. Cook the rice flour-pounded groundnuts mixture and stir continuously
- d. After reaching boiling point, cook for 15 minutes
- e. Add the pounded vegetables and cook for a few minutes
- f. Add a little salt and sugar to taste



**NB:** The pounded groundnuts can be replaced with bean flour and palm oil. However the beans-enriched porridge must cook for 25-30 minutes.