



**National Food and
Nutrition Commission**



**Government of the
Republic of Zambia**

Improved Complementary Foods Recipe Booklet



**Family Foods for Breastfed
Children in Zambia**

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financial support by



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Family Foods for Breastfed Children in Zambia

Lusaka, Zambia
2007

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The recipes in this booklet were developed and field-tested in Luapula Province. However, the general guiding principles and recommendations for young child feeding are applicable in Zambia as a whole. The recipes can easily be adapted for use in different parts of Zambia so as to fit in with local food and eating patterns and the seasonal availability of different foods.

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The booklet was written by Charity Dirorimwe, FAO Nutrition Education Consultant.

The recipes were developed and tested by an intersectoral team of health, agriculture and community development staff from Kawambwa, Mwense, Chienge and Nchelenge Districts in Luapula Province in collaboration with the Ministry of Health. Technical and financial support was provided by the Food and Agriculture Organization of the United Nations through Project GCP/ZAM/059/BEL – Luapula Food Security, Nutrition Action and Communication Project.

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We hope that the information in this booklet will help to improve the health and nutrition of young children in Zambia.



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Introduction

This recipe booklet fills an important gap: it provides information and guidance on the selection and preparation of good, nutritious and safe complementary foods for feeding infants and young children, aged 6 to 24 months.

Purpose and use of this booklet

This recipe booklet is the first of its kind available in Zambia. It is for everyone who genuinely cares about improving the nutrition and health of infants and young children. It is for community service providers such as community nutrition promoters, peer educators and other development agents from the health, community development and agricultural sectors working with families and community groups. The booklet is intended as a companion guide to the ***Growth Promotion Counselling Cards***, to be used primarily by community nutrition promoters.



What is complementary feeding?

Complementary feeding means giving other foods in addition to breastmilk. Previously, the term “weaning” was used, but there was confusion about its meaning. Some people thought that weaning meant stopping breastfeeding; others thought that it meant the period during which the child changed from having only breastmilk to only family foods. “Weaning foods” could mean foods given when the child stopped breastfeeding or during the change from breastmilk to family foods.

Using the term “complementary foods” helps to avoid this confusion and ensures that the recommended feeding of children aged over six months is:

- continued breastfeeding; plus
- giving additional foods and fluids.

Infant and child feeding problems in Luapula Province

The recipes were developed after carrying out a comprehensive assessment of infant and young child feeding practices in Luapula Province.

The assessment showed that infant and young child feeding was generally inadequate. Some of the common feeding problems that need to be addressed are:

- Most mothers do not breastfeed their children exclusively (meaning breastfeeding only) for the first 6 months of life. This means that a child does not get all the energy and nutrients needed for optimal child growth and development, as well as protection from infection.
- About half of the children are given water with salt during the first month of life. This practice may displace breastmilk, with the child receiving less of the protective factor in breastmilk. Also the water may be contaminated, so the risk of illness, especially diarrhoea, increases.
- About half of the children are given foods in addition to breastmilk from about three months onwards. Foods introduced consist of cassava or maize porridge with a little salt and/or sugar. Such foods often fill the child's stomach but provide less energy and nutrients than breastmilk, thus contributing to early growth faltering.
- When the child reaches 6 months of age, breastmilk alone is no longer adequate. Complementary foods given to children frequently do not provide the needed energy and nutrients.

The result is that many infants and young children under one year of age do not receive enough of the right kind of foods to grow and develop well, and they are often sick. In order to grow well

and remain healthy during this critical period of growth and development (6-24 months) children need to be fed well.



That means: breastmilk only up to 6 months; followed by breastmilk **plus** complementary foods from 6 months onwards.

Development of the recipes

The recipes in this booklet have been developed to meet the specific needs of small children aged 6 to 24 months. The recipes are based on local Zambian foods and child feeding patterns. All foods used in the recipes are available in Luapula Province and affordable to most families; they can be grown in the family farm or home garden, or purchased in local markets.

As a unique feature, recipes take into account the seasonal availability of different foods during the dry and the rainy seasons. This is intended to help mothers make the best food choices for variety, nutritional value and cost at different times of the year. The recipes strive to follow the World Health Organization (WHO) guidelines on Complementary Feeding: family foods for breastfed children (WHO, 2000).

Mothers, caregivers and other community members from Chienge, Mwense, Nchelenge, and Kawambwa Districts actively participated in the development and testing of the recipes.



They generously shared their knowledge on local child feeding practices, participated in food preparation and tasting sessions with their children, provided feedback on their children's likes and dislikes and were willing to try the recipes at home.

The complementary food recipes presented in this booklet are the ones that were liked best by the children, mothers and/or caretakers who participated in the trials.



Guiding principles for improved local porridges



Good complementary foods are rich in energy, protein, vitamins and minerals. They should be clean and safe, soft and easy for the child to eat and they should not be too spicy and salty. Ingredients for making them must be locally available and affordable and the foods must be easy to prepare.

The traditional cassava, maize or rice porridge recipes were therefore improved by:

- **Adding** pounded groundnuts, beans or dried fish flour when these ingredients are readily available in households. These foods add nutritional value, taste and energy. They are especially important for child growth and mental development.
- **Adding** shredded or pounded green leafy vegetables. Green leafy vegetables provide vitamins and minerals and protect the body from infection. They are important for staying healthy.
- **Adding** red palm oil or vegetable oil to increase the energy content of the porridge without increasing its bulk (volume). Only a small amount of oil (e.g. one teaspoon) is needed as it is full of energy. Vegetables and fatty foods (e.g. groundnuts, fatty fish or meat) are also good because they help the body to absorb more vitamins from others foods, especially vitamins A, D, and E. Red palm oil is especially good as it contains a lot of vitamin A, which helps the body to fight disease and keeps children's eyes healthy.

The complementary foods were further improved by reducing the salt content to a two-finger pinch of salt per feed and not more than 4 two-finger pinches of salt per day.



Two-finger pinch of salt

Part I

Family Foods and Complementary Feeding

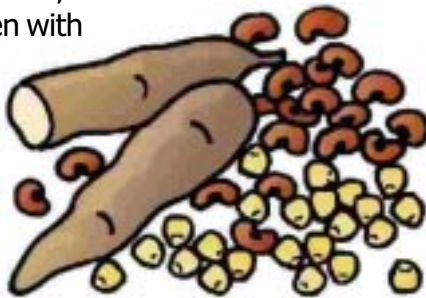
Families in Luapula Province enjoy eating many different foods during the year. The more variety they have in the foods they eat at all times during the year, the better their chances will be of meeting the nutritional needs of different family members.

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

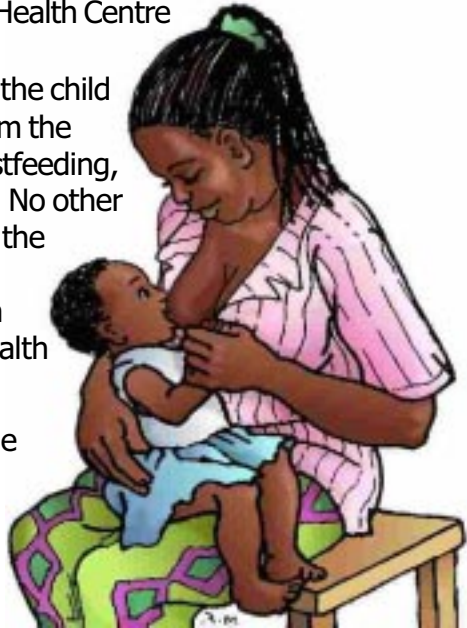
Breastmilk is the best food for babies from birth up to the age of 6 months. It is clean and safe, protects the child from diseases, contains the energy and nutrients that the child needs to grow and develop and it is ready to drink. Breastmilk contributes significant amounts of energy and nutrients 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 cup¹ of cassava or rice flour use ½ cup of groundnuts or beans or fish flour because cassava and rice have very little protein.

¹ 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 Age¹

Age group of Child	Daily Meals of Complementary Food	Quantities of Flour for One Meal	Quantities of Cooked Food per Serving
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>Comment: 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>Comment: Thicker consistency. Finely chopped or mashed foods, and foods that baby can pick up.</p>			

¹ 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>Comment: 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 1st hand



Washing 2nd 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 salt¹
- 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

¹ 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.

Part IV

Recommended Complementary Food Recipes for the Late Dry and Early Rainy Season (September to December)

Food reserves are relatively low in most households during the late dry and early rainy seasons and the range of available foods is narrow. Households generally have cassava, fish, and some exotic vegetables where dry season gardening is practised. Availability of indigenous vegetables improves gradually one month after the onset of rains.



Foods available to households during the late dry and early rainy seasons

Recommended complementary feeding recipes include:

- Cassava and fish porridge
- Rice and fish porridge
- Fish soup and soft nshima

Furthermore, mothers and caregivers are strongly urged to keep and store some groundnuts for enriching small children's complementary feeds after the November planting season. This will help to improve the range of complementary feeds given to the small child.

Maize and fish porridge



Ingredients:

- 1 cup maize meal
- ¼ cup of pounded fish (big or small fish)
- 2-4 teaspoons shredded/pounded green leafy vegetables
- 4 cups water
- 1 light two-finger pinch of salt
- A little sugar to taste

- a. Lightly roast the dried fish for 3-5 minutes before pounding
- b. Make the fish flour measure ¼ of a cup
- c. Mix maize flour with pounded fish
- d. Add water and mix into a smooth paste
- e. Cook the maize flour-pounded fish mix while stirring
- f. After reaching boiling point, cook for 15 minutes
- g. Add the pounded vegetables and cook for 3-4 minutes
- h. Add salt and sugar to taste



NB: The light roasting of fish helps to reduce the fishy smell and makes the pounding easier

Cassava and fish porridge

Ingredients:

- 1 cup cassava meal
- ½ cup of pounded fish (big or small fish)
- 2 teaspoons of palm oil or salad oil
- 4 cups water
- 1 light two-finger pinch of salt
- A little sugar to taste



- a. Prepare the fish flour as indicated in the maize and fish porridge recipe above
- b. Put 3 cups water and the fish flour into the pot and bring them to boil
- c. Cook the mixture for 5-10 minutes
- d. Add salt and sugar to taste
- e. Add palm oil/salad oil
- f. Add the cassava flour, mix well and serve

Fish soup

(To be served with soft nshima for the small child)

Ingredients:

4 tablespoons of pounded fish (big or small fish)
2-4 teaspoons shredded/pounded green vegetables
2 tablespoons of palm oil or salad oil
1 tomato
½ onion
1 light two-finger pinch of salt



- Prepare the fish flour as indicated in the maize and fish porridge recipe above. Cut the tomato and onion
- Put the oil in a pot and fry the onion and tomato for 3-4 minutes
- Add the pounded fish
- Add the pounded vegetables and salt
- Cook for 3-4 minutes
- Feed the small child with the fish soup and soft nshima



NB: This recipe is highly appreciated and provides an alternative to the cassava or maize with fish porridge

Part V

Recommended Complementary Food Recipes for Late Rainy Season (February to March)

Food reserves start improving during the late rainy season as households start harvesting green maize, fresh beans and fresh groundnuts, pumpkins and gourds. Indigenous vegetables are also readily available.



Foods available to households during the late rainy season

Recommended complementary feeding recipes include:

- Fresh maize and fresh groundnut porridge
- Cassava and fresh groundnut porridge

The fresh maize can be replaced with fresh beans with palm oil or vegetable oil.

Furthermore, the pumpkin/gourd recipe given in Part V can be prepared if the household is still experiencing serious food shortages.

Fresh maize and fresh groundnut porridge



Ingredients:

- 2 medium cobs of fresh maize
- ¼ cup pounded fresh groundnuts (pound, dry for 60 to 90 minutes, then pound again and sieve)
- 2-4 teaspoons shredded/pounded green leafy vegetables
- 2½ to 3 cups water
- 1 light two-finger pinch of salt
- A little sugar to taste

- a. Pound the fresh maize until very mushy
- b. Put the pounded maize in a bowl and add 1 cup of water and mix well
- c. Strain the mixture with a sieve and put the strained pounded maize-water mixture in a pot
- d. Pounding the remaining maize, add another ½ cup of water and strain
- e. Add the pounded fresh groundnut flour
- f. Mix well and cook the maize flour-pounded groundnut mixture while stirring
- g. After reaching boiling point, cook for 15 minutes

- h. If necessary, add some of the remaining water to thin it to the right consistency
- i. Add the pounded vegetables
- j. Add salt and sugar to taste

Option 2 for preparing the fresh maize and fresh groundnut porridge

- a. Prepare the fresh maize liquid as instructed above
- b. Pound shelled fresh groundnuts until you have a sticky paste
- c. Put the paste in a bowl and pour $\frac{1}{2}$ cup of the water into the paste and mix well
- d. Strain the mixture with a sieve into the bowl and pound again the remaining coarse groundnut particles into a smooth paste
- e. Pour another $\frac{1}{2}$ cup of water into the paste, mix well and strain
- f. Take 1 cup of the strained fresh maize liquid and $\frac{1}{4}$ cup of the strained fresh groundnut liquid and mix well in a pot
- g. Cook the maize flour-pounded groundnut mixture while stirring
- h. After reaching boiling point, cook for 15 minutes
- i. Add the pounded vegetables
- j. Add salt and sugar to taste



NB: If fresh groundnuts are replaced with fresh beans, cook the porridge for 20-25 minutes

Cassava and fresh groundnut porridge



Ingredients:

- 1 cup cassava flour
- ½ cup pounded fresh groundnuts (pound, dry a bit, then pound again and sieve)
- 2-4 teaspoons shredded/pounded green leafy vegetables
- 2½ to 3 cups water
- 1 light two-finger pinch of salt
- A little sugar to taste

- a. Shell the fresh groundnuts and pound into rough granules
- b. Dry the partially pounded groundnuts for 60 - 90 minutes
- c. Pound again into a flour and sieve
- d. Put 2 cups water into a pot and add ½ cup of the fresh pounded groundnut flour
- e. Mix well, bring the mixture to boil and cook the mixture for 5 minutes*
- f. Mix the remaining cup of cold water with the cassava flour and make a smooth paste
- g. Add the cassava paste into the pot and mix well
- h. Add the pounded vegetables
- i. Add salt and sugar to taste



* **NB:** If fresh groundnuts are replaced with fresh beans, the fresh beans liquid must be cooked for 20-25 minutes before adding the cassava flour

Options for processing fresh groundnuts

Option 1:

- a. Pound the shelled fresh groundnuts until you have a sticky paste
- b. Put the paste in a bowl and pour ½ cup of the water into the paste and mix well
- c. Strain the mixture with a sieve into the cooking pot and pound again the remaining coarse groundnut particles into a smooth paste
- d. Pour another ½ cup of water into the paste, mix well and strain
- e. Boil the strained liquid for 7-10 minutes
- f. Mix the remaining cup of cold water with the cassava flour and make a smooth paste
- g. Add the cassava paste, pounded vegetables, salt and sugar into the pot and mix well as above

Option 2:

- a. Shell the fresh groundnuts and roast them under low heat for 10-15 minutes
- b. Pound the roasted groundnuts into flour and sieve
- c. Use the roasted groundnut flour as in Part III, Pages 21 -26 – Cassava, Maize, Rice or Sweet Potato with groundnut porridge

Sweet potato and groundnut porridge

Ingredients:

3 medium size sweet potatoes
½ cup pounded roasted groundnuts
2-4 teaspoons shredded/
pounded green leafy vegetables
1 light two-finger pinch of salt
2¼ cups water



- a. Boil 3 medium size sweet potatoes and remove the skin
- b. Mash the sweet potatoes into a smooth paste
- c. Add the pounded groundnuts
- d. Add the shredded vegetables
- e. If necessary (depending on the type of sweet potatoes):
 - add little water to make the paste soft enough for the child;
and
 - heat for 3-4 minutes while stirring constantly.

Part VI

Recipes for Feeding Sick Children

Eating well helps to fight infections. Therefore the mother must make sure that the child eats well during illnesses. Furthermore, additional food and water are needed to replace the food and water lost during diarrhoea and vomiting. The food also helps the gut to recover and absorb water.



The sick child needs additional food and plenty of liquids

Infections often reduce appetite. They also increase the need for certain nutrients that are poorly absorbed by the gut and the body uses nutrients faster than usual when repairing the body's defence system. The mother should therefore:

- give her sick child small quantities of food frequently (every 1–2 hours) and encourage the child to eat more at each meal, especially if the child has no appetite;

- give the child soft foods and easy-to-eat foods which the child likes, but these should include energy-rich and nutrient-rich foods, e.g.:
 - porridges enriched with fish, eggs, poultry, meat, etc.
 - mashed bananas, mashed mangoes and other mashed fruits, including commonly consumed local fruits;
 - sweet potato or pumpkin and groundnuts mash or soup;
 - sweet potato or pumpkin and avocado mash ; and
 - soft nshima with okra and pounded groundnuts relish, which is easy to swallow.



Feed the child small amounts of food more frequently

- add extra fat or fatty foods and/or sweet foods, such as sugar or honey, where appropriate;
- give the child plenty to drink (boiled and cooled water, fresh fruit juice, soup or watery porridges) every 1–2 hours; and
- prepare foods and drinks in a clean, safe way to prevent food-borne infections.

If still breastfeeding, the mother should breastfeed the child more often. She can express the milk and feed it from a small cup or spoon if the child is too ill to suckle.

During recovery, the child will often get hungrier than usual and can eat more food and quickly regain the lost weight.

It is especially important that the child who is HIV+ eats a healthy and balanced diet to prevent weight loss and help him/her stay healthy longer. He/she needs plenty of clean and safe water to drink.

Okra with groundnuts

Ingredients:

4 fingers of okra or wild okra
2 tablespoons pounded roasted
or unroasted groundnuts
1½ cups water
pinch of soda
1 light two-finger pinch of salt



- a. Slice the okra fingers
- b. Put water into the pot and add a pinch of soda
- c. Add the sliced okra and cook for 7-10 minutes while stirring
- d. Add the pounded groundnuts and cook for a further 4 minutes
- e. Serve with soft nshima.



NB: Preparation of dried wild okra with groundnuts:
Use:

- 4 tablespoons of dried wild okra, and
- 2 tablespoons pounded groundnuts

Rice soup



Ingredients:

- 1 cup rice
- 4 cups water
- 2 tablespoons pounded groundnuts
- 2-4 teaspoons shredded/ pounded green leafy vegetables
- 1 light two-finger pinch of salt

- a. Put the rice and water in the pot and cook
- b. Cover the pot and cook until soft.
- c. Options: add** pounded groundnuts, grated carrots, pumpkin, sweet potato and finely chopped garlic.



NB: Good for coping with lack of appetite, nausea / vomiting, diarrhoea and digestive problems

Sweet potato soup

Ingredients:

1 cup chopped sweet potatoes
¾ cup water
¼ cup pounded groundnuts
1 light two-finger pinch of salt



- Peel sweet potatoes, cut them and cook in little water until soft.
- Mash sweet potatoes and add more water to make soup.
- Add pounded groundnuts and bring soup to boil, stirring often and serve.



NB: Good for coping with lack of appetite, nausea / vomiting. Sweet potatoes can be replaced with pumpkins

Pumpkin and avocado mash

Ingredients:

1 cup of chopped pumpkin
½ of medium avocado pear
Water
A little sugar to taste (optional)



- Peel the pumpkins, cut into small pieces and cook in little water until soft.
- Mash pumpkin and add a little water to make it soft if necessary.

- c. Add mashed avocado, mix well and warm for a few moments.
 - d. Add a little sugar to taste if necessary and serve.
- The pumpkin can be replaced with sweet potatoes or rice.



NB: Not good for people with diarrhoea

Foods to eat: Nausea and vomiting:

- If the child is vomiting, give him/her small amounts of fluids like water and soups frequently. Give him/her soft foods - the child can return to solid foods when the vomiting stops.
- The feeling of nausea may be reduced by the smell of fresh orange or lemon peel, or drinking lemon juice in warm water, herbal tea or ginger drink.
- Dry and salty foods such as roasted groundnuts help to relieve nausea.

Foods to eat: diarrhoea:

- Give the child soft, mashed, moist foods like:



- soft fruits and vegetables, (e.g., banana, mango, papaya, watermelon, pumpkin, gourd, carrots, etc.);
- Vegetable soups;
- fresh fruit juices; and
- Mashed sweet potatoes; and
- Feed the child with refined foods like white rice and refined maize meals.

Annex I

1. Recommended Salt Intake in Household Measures

In the absence of WHO or any other international guidelines, the recommended salt intake levels by the Food Standards Agency, UK, were used as a basis for reducing the salt levels of complementary foods.

Mothers were advised to use one two-finger pinch of salt for every feed, but not more than 4 two-finger pinches in a day. Should the father prepare the porridge, he is advised to take a very light two-finger pinch of salt. **Table 2** below gives the recommended daily salt intakes by age group.

Table 2: Salt Intake Recommended by the Food Standards Agency, UK

Age group	Recommended daily intake expressed in household measures
< 6 months	1-3 pinches of salt
7-12 months	4 pinches of salt or $\frac{1}{8}$ teaspoon
1-3 years	$\frac{1}{4}$ teaspoon
4-6 years	$\frac{1}{3}$ teaspoon
7-10 years	$\frac{1}{2}$ teaspoon
11-14 years	$\frac{3}{4}$ teaspoon
> 14 yrs & adults	$\leq \frac{3}{4}$ teaspoon



NB: Always use salt that is iodised!

2. Common Household Measures Used

- a. 4 two-finger pinches of salt = an eighth of a teaspoon
= 1 gram
- b. 1 heaped teaspoon of sugar = 5 grams sugar
- c. 1 of the common enamel cups (full to the brim) = 375 ml
= 20 tablespoons
- d. 375 ml cup = 180 gm cassava flour
= 250 gm groundnuts

Annex II

Recommended Daily Allowances (RDA) of Energy (kilocalories) for Children Aged 6 to 24 months and Energy Provided by the Complementary Food Recipes

According to the WHO Guiding Principles on Complementary Feeding of the Breastfed Child, the total energy requirements of healthy breastfed children vary with age and these are provided in the Table below. Also provided in the table are the average energy contributions of breastmilk and complementary foods by age.

Age Group of Child	Energy Re-quirements	Average Breast-milk Energy Intake	Energy Needed From Complemen-tary Foods
6-8 Months	615 Kcal	413 Kcal	200 Kcal
9-11 Months	686 Kcal	379 Kcal	300 Kcal
12-24 Months	894 Kcal	346 Kcal	550 Kcal

On the basis of the quantities per serving provided in Table 1 on page 18, and the recommended number of meals per day, recipes in this booklet on average provide:

- 226-271 Kcal to children aged 6-8 months
- 372-376 Kcal to children aged 9-11 months
- 596-626 Kcal to children aged 12-24 months

The recipes therefore provide at least 37%, 54% and 67% of the energy requirements of children aged 6-8 months, 9-11 months and 12-24 months respectively.

In the majority of recipes, 33-40% of the energy comes from fat. In a few cases (mostly the maize/cassava/rice and beans recipes), 22-32% of the energy comes from fat. In all recipes 12 to 15% of the energy is provided by protein.

Breastmilk alone is ideal to start a child's life. It should be fed alone for the first 6 months of life. However, after this period additional foods are needed. The foods that are given in addition to breastmilk are called ***complementary foods***. To make sure that young children grow well and stay healthy, they need ***complementary foods*** that are nutritious and safe and are fed in adequate amounts.

This recipe booklet fills an important gap: it provides information and guidance on the selection and preparation of locally available, nutritious and safe complementary foods that are easy to prepare for feeding infants and young children, aged 6 to 24 months. It is aimed at community nutrition promoters, peer educators and other development agents from the health, community development and agricultural sectors working with family and community groups.



Improved Complementary Foods Recipe Booklet
Family Foods for Breastfed Children
For Luapula Province

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