

Cassava into Bread

How to make an alternative bread from cassava



IITA

International Institute of Tropical Agriculture
Ibadan, Nigeria

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Cassava into Bread

Gillian Eggleston

By developing high-yielding cassava varieties, the International Institute of Tropical Agriculture (IITA) and various national programs have made it possible for cassava to be grown profitably by farmers in the tropics. IITA has also developed methods to utilize cassava in the making of bread with flour from cassava varieties which are particularly suitable for farming in Nigeria.

Our research into cassava utilization has been motivated by concern about the high levels of malnutrition and undernutrition among poor families, rural and urban, who depend on cassava as their dietary staple.

Written for trainers, technicians, and the interested layman, this booklet tells how to make nutritious bread using composite flours (cassava-soy and cassava-wheat) or cassava flour.

The technical content was developed with the help of staff members of the Root and Tuber Improvement Program, particularly Paulyn Omoaka, and the Grain Legume Improvement Program. The Publications Unit edited and designed the booklet. The contributions of Hendrik Pleysier and Adeola Ala, who produced the illustrations used in this publication, are gratefully acknowledged.

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Benefits from cassava bread

1. Increased bread consumption

Use of locally produced flours will permit more economical production of bread and encourage its consumption to expand.

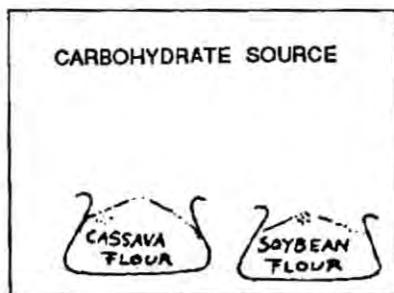
2. Crop production

The use of cassava in the production of bread will encourage cassava farming, processing and marketing, and help create new jobs.

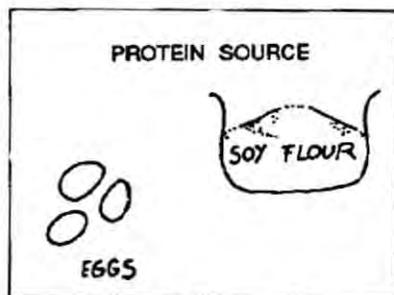
3. Nutrition

To stay healthy the body needs the following nutrients in varying amounts which are to be found in the breads described in this book.

- **Carbohydrates.** Carbohydrates produce energy for basic body functions and satisfy hunger. They are provided by the starch and sugars in the cassava and soy flour.



- **Proteins.** Proteins are body-building nutrients needed for maintenance and growth of body tissues. They are provided by the eggs and soyflour added to the mixture.



- **Fats.** Fats are also energy providers and produce twice as much energy per gram as carbohydrates and proteins. They are provided by the added margarine and the flours used.



- **Vitamins and minerals.** Vitamins and minerals are essential for normal growth and good health. They are provided by the margarine, cassava, and soyflour.
- **Water.** Water controls body processes and helps in transporting nutrients throughout the body.

4. Safe level of cyanide

After flour preparation and baking, cassava bread contains little or no cyanide.

5. Simple methodology

Cassava bread production does not require sophisticated or expensive equipment. Unlike in conventional bread-making, there is only one straightforward fermentation stage.

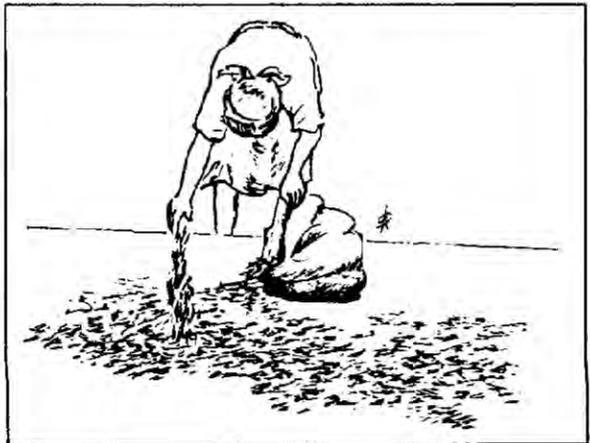
Making the flour

Cassava flour

IITA has identified the high-yielding cassava clones which are most suitable for bread-making purposes. These include varieties TMS 30001, TME 1 (Antiota), and TMS 4(2)1425. Flour produced from cassava grown for 12-15 months is most suitable for bread-making. If harvested earlier, the yields are relatively low. After 15 months, the yields begin to decline, fibre content increases, and flour quality worsens.

Method

1. Peel and wash fresh cassava tubers.
2. Cut into thin chips using a knife or a chipping machine, if available.
3. Dry the chips on clean trays, mats or plastic sheets, or on a raised clean surface (to prevent contamination by dust, animal excrement, etc.) for approximately 2–3 days; or in an oven at 55° C for 24 hours.



Note: It is important that the chips dry *within 2–3 days* so that the flour will be white and free from offensive flavors and odors.



4. Grind the dried chips into flour at the local mill, or pound the chips by hand with a mortar and pestle.



5. Sift the flour through a fine sieve.



6. Store the flour in airtight polyethylene bags or containers until use.



Soy flour

Roasted or raw soy flour can be added to the cassava flour.

Method (roasted beans)

1. Clean beans by removing stones, dirt, and any spoiled beans.
2. Warm beans in a pan over a fire.
3. Split the seed on a grinding stone.
4. Winnow out the hulls.
5. Roast for 20 minutes.
6. Grind beans into flour at the local mill or on a grinding stone.
7. Sift the flour.
8. Store in a dry container until use.

Method (raw beans)

1. Clean beans by removing stones, dirt, and any spoiled beans.
2. Grind beans into flour at the local mill or on a clean grinding stone.
3. Sift the flour.
4. Store in a dry container until use.

Making the alternative cassava breads

The following recipes for making alternative cassava breads were developed and tested at IITA using locally available ingredients. They do not require elaborate or expensive equipment. Unlike in conventional wheat bread-making, there is only one straightforward fermentation stage.

Cassava-soy bread

(or, pure cassava bread)

Ingredients

Cassava flour	80 grams (4 heaped dessertspoonfuls)
Soy flour (raw or roasted)	20 grams (2 heaped teaspoonfuls)
Whisked eggwhite	from one large-sized egg
Salt	1.5 grams (2 pinches)
Sugar	6 grams (1 teaspoonful)
Margarine	10 grams (1 level teaspoonful)
* Dried yeast	1.5 grams ($\frac{1}{2}$ teaspoonful)
Water	70–90 milliliters ($\frac{1}{3}$ – $\frac{1}{2}$ cup)

Notes

If desired, or if no soy flour is available, bread from 100% cassava flour can be produced using this recipe. Simply add 1 more heaped dessertspoonful of cassava flour to this recipe.

* NO SUBSTITUTES FOR MARGARINE SHOULD BE USED—ONLY MARGARINE CAN ENSURE THE RIGHT RESULTS.

Method

1. Pour all the dry ingredients and margarine into a bowl and mix thoroughly with a wooden spoon.
2. Separate the eggwhite from the yolk, and whisk until foamy.
3. Add the whisked eggwhite and water to the other ingredients in the bowl (see illustration on next page). Mix thoroughly for 10-20 minutes, using a wooden spoon, fork, or whisk.

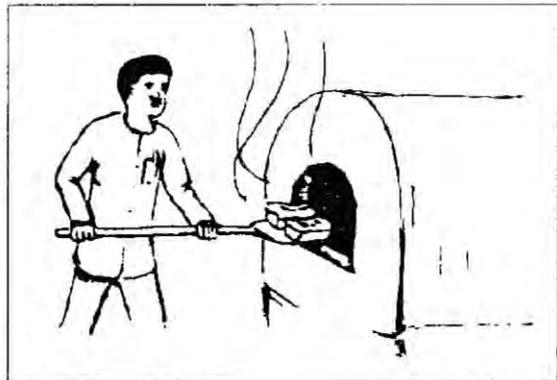
The amount of water added depends on the cassava variety used. Normally enough water should be added to produce a batter which does not drop from a spoon quickly.



4. Pour the batter into a small sized, greased baking pan, cover it with a moist cloth and keep it in a warm area, undisturbed, until it rises to twice its original volume (about 60 minutes). (The batter ferments during this stage.)



5. Put the pan carefully, without shaking it, in an oven maintained at 200°C for about 30 minutes, or until baked.



6. When cool, remove the bread from pan and store.



Wheat-cassava (composite) bread

An acceptable loaf that resembles wholewheat bread can be obtained with up to 30% substitution of wheat flour with cassava flour, provided that precisely the "right amount" of water is used.

Ingredients

Flour/water	WHEAT FLOUR	CASSAVA FLOUR	WATER
EITHER	90 g (3 heaped dessertspoonfuls)	10 g (1 heaped teaspoonful)	$\frac{1}{4}$ cup + 1 extra teaspoonful
OR	80 g (2 $\frac{1}{2}$ heaped dessertspoonfuls)	20 g (2 heaped teaspoonfuls)	$\frac{1}{4}$ cup + 2 extra teaspoonfuls
OR	70 g (2 $\frac{1}{4}$ heaped dessertspoonfuls)	30 g (3 heaped teaspoonfuls)	$\frac{1}{4}$ cup + 3 extra teaspoonfuls
Salt	1.5 grams (2 pinches)		
Sugar	6 grams (1 teaspoonful)		
Margarine	4 grams ($\frac{1}{2}$ level teaspoonful)		
Dried Yeast	1.5 grams ($\frac{1}{2}$ teaspoonful)		

Method

1. Weigh out all the dry ingredients in a mixing bowl and add the “appropriate amount” of water. To estimate the amount water of needed, enough water should be added so that the dough mixture is not too wet (sticky) or too hard when pulled apart. The more cassava flour is added the more water is needed, but this depends on the flour used. A test bake should be undertaken to ascertain the right amount of water.

2. Mix with a wooden spoon for 2 minutes. Turn the dough onto a clean board or table and knead for 2 minutes.

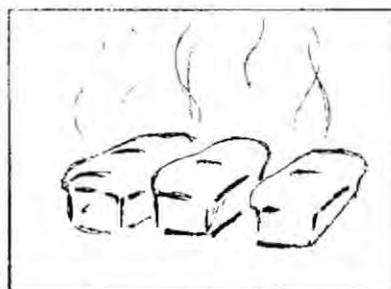
3. Cover the dough with a damp cloth and leave to rise in a warm place, undisturbed, for about 30 minutes.

4. Knead the dough again on a clean table/board. Mold it to fit into greased baking pans.

5. Keep the dough in a warm place until it doubles in size.



6. Put the dough into an oven and bake at 220°C for about 24 minutes, or until done.



Storage

This cassava bread can be stored for up to 4 days, if it is packaged in an airtight polyethylene bag or container at room temperature.

If the bread is left in the open, it molds easily and spoilage sets in.



Ways of eating alternative cassava breads

1. Before eating, cassava bread should be heated slightly to improve its texture.
2. It is delicious enough to be eaten alone.
3. It can be eaten with soups, stews, tea, jam, jelly, marmalade, or butter/margarine.



About IITA

The goal of the International Institute of Tropical Agriculture (IITA) is to increase the productivity of key food crops and to develop sustainable agricultural systems that can replace bush fallow, or slash-and-burn, cultivation in the humid and subhumid tropics. Crop improvement programs focus on cassava, maize, plantain, cowpea, soybean, and yam. Research findings are shared through international cooperation programs, which include training, information, and germplasm exchange activities.

IITA was founded in 1967. The Federal Government of Nigeria provided a land grant of 1,000 hectares at Ibadan, for a headquarters and experimental farm site, and the Rockefeller and Ford foundations provided financial support. IITA is governed by an international Board of Trustees. The staff includes around 180 scientists and professionals from about 40 countries, who work at the Ibadan campus and at selected locations in many countries of sub-Saharan Africa.

IITA is a member of a system of international agricultural research centers supported by the Consultative Group on International Agricultural Research (CGIAR). Established in 1971, CGIAR is an association of about 50 countries, international and regional organizations, and private foundations. The World Bank, the Food and Agriculture Organization of the United Nations (FAO), and the United Nations Development Programme (UNDP) are cosponsors of this effort.

International Institute of Tropical Agriculture

Oyo Road, PMB 5320, Ibadan, Nigeria

Telephone: (234-022) 400300-400318