

POOR TECHNIQUES FOR PROCESSING BITTER CASSAVA

The following processing techniques when used are not suitable for removing harmful substances from bitter cassava roots.

Sun-drying:

Simply sun-drying whole roots or root pieces of bitter cassava is not sufficient to remove all the harmful substances. This is because the root structure has not been broken down to allow the harmful substances to be released.

Boiling:

Boiling unfermented bitter cassava roots will not remove harmful substances. Therefore, just boiling or roasting fresh 'bitter' cassava roots will not make the roots safe to eat.

A FINAL REMINDER

Bitter cassava is a safe and nourishing food as long as one of the three processing methods described in this leaflet is used. However, it does not provide all the nutrients needed for healthy living, particularly for children, and should be eaten with meat, vegetables or fish.

Children in particular should be strongly discouraged from eating unprocessed bitter cassava roots.

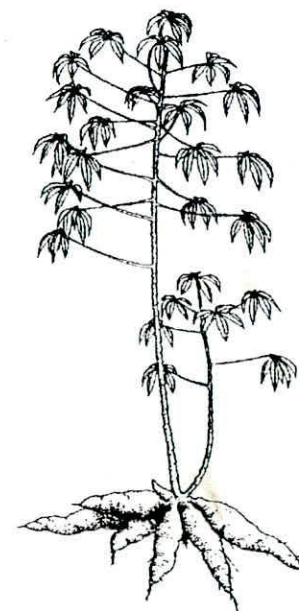
Nobody should suffer ill health from eating bitter cassava as long as the roots are processed thoroughly. However, ill health can occur from eating bitter cassava if:

- the roots are not fermented;
- a processing step is missed out or the recommended time for a step is reduced; and
- large amounts of poorly processed roots are eaten without foods such as meat, fish and vegetables over long periods.

For more information, please contact:

- Your District Agricultural Office
- National Post-harvest Research Programme, KARI-Kawanda, P.O. Box 7065, Kampala (phone: 041-567708)
- National Cassava Programme, NAARI-Namulonge, P.O. Box 7084, Kampala (phone: 041-341554)

PROCESSING BITTER CASSAVA FOR FOOD



NARO

National Agricultural
Research Organisation

National Cassava Programme

Namulonge Agricultural and
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WHY PROCESS BITTER CASSAVA?

Cassava plants contain potentially harmful substances. Depending on the amount of harmful substances they contain, cassava varieties can be bitter. Sweet varieties contain fewer harmful substances and in general do not need to be processed. Bitter varieties however contain higher amounts of harmful substances. These can cause problems unless they are removed.

There are several ways to process bitter cassava roots effectively. The key point to remember when processing cassava is that each step in the process must be followed in the correct order. **Never** miss out or shorten a step.

The main steps in processing bitter cassava are:

1. **breaking up and softening the roots as much as possible; and**
2. **drying the product completely.**

EFFICIENT TECHNIQUES FOR PROCESSING BITTER CASSAVA

A Traditional dry fermentation

1. Peel the cassava roots.
2. Heap the roots in a shady position and cover with banana leaves or jute sacks for 4 days in order to allow moulds to grow.
3. When the moulds have grown sufficiently, uncover the roots, scrape off the mould and pound them to a coarse pulp.
4. Spread the pounded pulp out on a mat and leave it in the sun to dry. This will take between 1 and 3 days. Once dry, grind the cassava pieces to a fine flour. The flour can be kept in this form for a year in dry conditions.

ALWAYS DRY CASSAVA PULP COMPLETELY BEFORE EATING

B Traditional wet fermentation

1. Wash the roots.
2. Peel the roots.
3. Soak the roots in water in drums, in pots or in ponds. During this step fermentation occurs. The roots should be soaked for at least 3-4 days.
4. Remove the cassava roots from the water.
5. Pound the roots into a coarse pulp. Place the pulp into a clean sack and squeeze out as much water as possible.
6. Dry in thin layers in the sun either on mats or large rocks. Drying the pulp on rocks has the advantage of allowing drying to continue overnight because the rocks absorb heat during the day and release it at night. Drying takes between 1 and 3 days, depending on the weather.
7. Pound the dried cassava into a flour. Store the flour in sacks and keep it in a dry place until it is required. In this form it can be kept for up to a year in dry conditions.

C Rapid fermentation method (Gari)

1. Wash and peel the roots.
2. Grate the washed roots to form a fine pulp. This is usually done with hand graters which consist of perforated tin sheets set in a frame. In some areas of Uganda, motorised graters are being introduced.
3. Put the grated cassava pulp in a cloth bag, jute sack or clean woven polypropylene bag and tie the top securely.
4. The cassava pulp will ferment in the bag.
5. Water should be removed from the pulp during fermentation. It can be removed in either of two ways: (a) place logs or stones on top of the sacks in order to squeeze water from the cassava pulp or (b) press the sack between two boards tied together with ropes. Tighten the ropes to put pressure on the sack and squeeze water from the pulp.

Fermentation and de-watering can be completed in 1 day if a mild tasting flour is required. If a more acidic taste is required the cassava pulp can be fermented for up to 4 or 5 days.

6. When the cassava pulp has stopped losing water, take it out of the sack and sieve it to separate the crumbs, remove fibre and poorly grated material.
7. Roast the crumbs in a wide and shallow pan over the fire. During roasting, use a spoon to toss the crumbs. Stir the crumbs continuously until they become light and dry. Roasting is important as it rapidly dries the cassava pulp and drives off any remaining harmful substances.
8. Cool the gari crumbs by spreading them out on a mat or plastic sheet.
9. Sieve the gari crumbs in order to ensure uniformity of grain size. Large crumbs should normally be milled or pounded and added to the sieved gari. Pack the fine gari into polythene bags, jute sacks or paper bags. Well-prepared gari stores for at least 12 months. Gari is sometimes eaten in the dry state but more commonly it is soaked in hot water, which causes the grains to swell and soften.

NEVER DRY BITTER CASSAVA ROOTS WHICH HAVE NOT BEEN GRATED BECAUSE THIS DOES NOT REMOVE THE HARMFUL SUBSTANCES.

DO NOT ROAST UNGRATED BITTER CASSAVA. THIS WILL NOT REMOVE THE HARMFUL SUBSTANCES IN THE ROOTS.