Making High-Quality Cassava Flour

Case study 1

Before

Agnes and Paul grew cassava which they simply boiled and ate. Any remaining cassava was wasted and they had no income.

Then

They contacted their extension office for information and learned about making high-quality cassava flour.

Case study 2

The Fimpulu Cassava Processing and Marketing Association is made up of 30 farmers who jointly manage a cassava processing plant at Fimpulu, 25 miles from Mansa, in Luapula Province of Zambia. In the past, the farmers produced traditionally processed cassava chips. After training by local extension workers on different processing options for better cassava products, farmers now produce high-quality cassava flour. They process about 500 kg of fresh cassava and package the flour within 24 hours of harvesting. They sell their flour to biscuit manufacturers in Lusaka and copper belt towns in Zambia. The high-quality flour earns the group more income compared to traditionally processed cassava chips. The farmers comfortably support their children in schools and pay their rents regularly. The Fimpulu farmers are confident that making high-quality flour from cassava has great potential to reduce rural poverty in the region.
How to make high-quality cassava flour

Making High-Quality Cassava Flour

Step 1: Selecting roots
Harvest or buy healthy, mature, firm, 10- to 12-month-old cassava roots. These should have no bruises. The flesh of the roots should be white with no cracking and few fibrous roots.

Step 2: Peeling
Peel the roots and remove the stalk, woody tips and any fibrous roots using a sharp knife. Failure to peel properly will result in off-colour in the final product.

Step 3: Washing
Wash peeled cassava roots with clean water to remove any dirt, including sand, soil and any lumps. This is important to ensure complete drying of the flour.

Step 4: Grating
Use a simple perforated iron sheet or mill (village posho mill). Obtain high-quality free-flowing flour, free of fibre with a good particle size.

Step 5: Pressing
Press the grated cassava mash into a clean bag, such as a jute or sisal sack that will allow extra water to escape. Press the sack using a screw press or hydraulic jack to remove excess water until the cassava is crumbly.

Step 6: Drying
Spread the crumbly cassava mash thinly on a clean black plastic sheet placed on a gentle slope in full sun. Ideally this should be raised off the floor. Dry mash until it is very floury. Cover with netting to keep off flies and birds.

Though solar, stove and hot-air dryers are more expensive, the drying process is a major source of high-quality free-flowing flour.

Step 7: Milling
Mill the dried cassava mash to produce flour. Milling can be done using a hammer mill (ridge table mill).

Step 8: Sifting
Use a simple home-made sieve, sift the milled flour to remove fibrous materials and any lumps. This is important to obtain high-quality free-flowing flour, free of fibre with a good particle size.

Step 9: Packaging and storing
Pack sifted cassava flour in airtight moisture-proof black plastic bags. Seal the bag using a burning candle (or an electrical polysealer if electricity is available) and label with the date of manufacture and expiry date (after six months). Pack the bags in a carton to protect from light. Store the carton in a dry place (e.g., under a tarpaulin).

What can go wrong and how to deal with it

Potential problems Caused by How to prevent and/or solve it
Spoilt cassava roots Roots that are too old or damaged Use 10- to 12-month-old cassava roots
Mould in stored flour Improper drying leaving flour too wet Use proper drying methods
Flour for processing flour too long after milling
Bad smell of flour (fermented odour) Rusty equipment Use stainless steel leaves
Wash and dry equipment
Moldy environment Poor drainage system Ensure proper flow of cassava waste water into a soak pit and keep your processing area clean
Contaminated flour Dirt and insects in mash while drying roots Avoid storing flour in warm or damp places
Waste of porous or damaged packaging materials Use clean, strong plastic bags
Poor ventilation in storage area
Avoid storing flour in warm or damp places
Sickness/poisoning from eating bitter roots
Use of very bitter cassava roots
Improper processing methods Use proper processing methods and low-cyanide (less bitter) varieties

Cassava is not fully utilised in Eastern Africa compared to West Africa (Nigeria, Ghana). Cassava is drought tolerant, easy to grow and simple to harvest. All parts of the cassava plant are valuable. Cassava leaves can be used to make soup or as feed for livestock, the stems can be used for planting more cassava, for mushroom production or as firewood, the root can be used to raise fish, and the root can also be used for planting more cassava, for mushroom production or as firewood. Cassava can also meet industrial needs such as the production of bio-fuel and starch for use in paper- and drug-making industries.

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You may be able to hire a press and grater locally. Local famine relief agencies, industries, schools, hospitals, shops, kiosks, hotels, restaurants and local famine relief agencies.

Accessible markets include bakeries, millers and paper fabricators of processing equipment are also available in some areas.

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Ask your local extension officer or agricultural research station.

Questions about processing can be directed to the CTA Practical Guide Series, No. 5

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Step 1: Selecting roots
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Step 2: Peeling
Peel the roots and remove the stalk, wood, hair and any fibrous roots using a sharp knife. Failure to peel properly will result in discoloration in the final product. Cassava peel (after drying) can be used for animal feed or composting—so don’t waste it!

Step 3: Washing
Wash peeled cassava roots with clean water to remove any dirt, including sand, soil, and any lumps. This is important to ensure complete drying of the roots.

Step 4: Grating
Use a simple perforated iron sheet or mechanical grater to grate cassava roots into a fine mash. Though solar, stove and hot-air dryers are more expensive, the drying process is faster.

Step 5: Pressing
Press the grated mash into a clean bag, such as a jute or mesh sack that will allow extra water to escape. Press the sack using a screw press or hydraulic jack to remove excess water until the mash is crumbly.

Step 6: Drying
Spread the grated cassava mash thinly on a clean black plastic sheet placed on a gentle slope in full sun. Ideally this should be raised off the floor. Dry mash until it is very floury. Cover with netting to keep off flies and birds.

Step 7: Milling
Mill the dried cassava mash to produce flour. Milling can be done using a hammer mill (village posho mill). Obtain high-quality free-flowing flour, free of fibrous materials and any lumps. This is important to ensure complete drying of the final product.

Step 8: Sifting
Use a simple home-made sieve, often the milling flour to remove fibrous materials and any lumps. This is important to ensure complete drying of the final product.

What can go wrong and how to deal with it

Potential problems
Caused by

Spoilt cassava roots
Roots that are too old or damaged
Use 10- to 12-month-old cassava roots

Modest environment
Poor drainage system
Ensure proper flow of cassava waste water into a soak pit and keep your processing area clean.

Contaminated flour
Dirt and insects in mash while drying or due to poor ventilation in storage area
Avoid dirt and insects while drying the mash. Store the cassava mash in a well-ventilated, cool, dry place. The packaged flour will keep for about six months.

Sickness/poisoning from eating bitter roots
Use of very bitter cassava roots
Use proper processing methods and low-cyanide (less bitter) varieties

What you need to make high-quality cassava flour

To establish a small-scale enterprise to make high-quality cassava flour, you require:

CTA Practical Guide Series, No. 5

How to make high-quality cassava flour

Importance and benefits of cassava
Cassava is not fully utilised in Eastern Africa compared to West Africa (Nigeria, Ghana).

CTA Practical Guide Series, No. 5

What can go wrong and how to deal with it

Practical Guide Series, No. 5

Cassava is a drought tolerant, easy to grow and simple to harvest. All parts of the cassava plant are valuable. Cassava leaves can be used to make soup or as feed for livestock; the stems can be used for plantain or moro roots, for mushroom production or as firewood; the root can be eaten fresh or cooked and eaten fresh or processed into flour. Cassava can also meet industrial needs such as the production of bio-fuel and starch for use in paper- and drug-making industries.

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