

Cassava food processing and utilization in Kenya

Transformation et utilisation du manioc au Kenya

C.M. GITHUNGURI

*National Dryland Farming Research Centre - Katumani,
Machakos (Kenya)*

- Abstract -

Cassava is extensively grown and consumed in Kenya. This paper presents recipes for preparing different cassava based dishes in seven different communities.

- Résumé -

Le manioc est cultivé et consommé sur une grande échelle au Kenya. Cet article donne les recettes de plats à base de manioc préparés dans sept groupes ethniques.

Introduction

Cassava is grown virtually throughout Kenya. However, the Western, Coastal and semi-arid (Eastern) regions of Kenya have the highest production in that order. Traditional cassava utilization in Kenya is limited to roasting and boiling of fresh roots for consumption in all the growing areas (Khaemba, 1983). In Nyanza and Western provinces of Kenya, roots are also peeled, chopped into small pieces, dried and milled into flour for Ugali. This is normally in combination with a cereal (maize or sorghum). In the Coast province cassava leaves are used as vegetable (Khaemba, 1983) while in Machakos and Kitui, cassava roots are used as a snack.

The bulk of cassava produced in the country is used for human consumption and surpluses are processed into starch or used for animal feed. However, the present production is adequate for both the demands of starch production and as a food source (Khagram, 1983). The market for fresh cassava as food is more lucrative than for starch extraction but the market for fresh cassava is limited (Karisa, 1983). Except for cassava crisps, there is no commercial processing of cassava for human consumption. This area could be explored to make it more acceptable to a larger section of the population thereby increasing the demand for cassava products and the income of the farmer.

This paper reviews recipes for the preparation of different cassava-based food by six communities in Kenya.

1. Embu tribe of eastern province

1.1. Mucui.

Ingredients	Amount
Cassava roots	1 kg.
Yams	1/4 kg.
Potatoes	1/4 kg.
Arrow roots	1/4 kg.
Meat	1/4 kg.
Cooking oil/fat	150 g.
Onions	200 g

Cassava roots, yams, potatoes and arrow roots are peeled, washed with a lot of water, sliced into small pieces and mixed with meat. The mixture is fried in oil with onion to taste. Water is added and the mixture is left to boil until cooked. Mucui is served and eaten as a complete meal.

1.2. Roasted cassava

Ingredients	Amount
Cassava roots	As required.
Burning embers	As required.
Tea	As required.

Whole cassava roots are peeled, washed, either split into smaller pieces or left intact as dictated by size, placed on burning embers and left to cook. Once done, the charred bits are scrapped off and the roasted cassava is served with tea.

2. Kamba tribe of eastern province

2.1. Mukimwa

Ingredients	Amount
Cassava roots	1 kg.
Green maize	1/4 kg.
Par-boiled beans	1/5 kg.
Par-boiled cowpeas	1/5 kg.
Par-boiled green grams or pre-boiled dolichos	1/5 kg.
Water	As required.
Salt to taste	As required.
Cooking oil/fat	150 g.
Onions	200 g

In the preparation of *mukimwa* cassava roots are peeled, washed, sliced into small pieces (chips) and mixed with green maize, par-boiled beans, par-boiled cowpeas, par-boiled green grams or par-boiled dolichos. The mixture is fried in oil with onions. Water is added and left to boil until cooked. After adding salt *mukimwa* is served as a complete meal.

2.2. Mulikyo

Ingredients	Amount
Cassava roots	1 kg.
Water	As required.
Tea or milk	As required.

Mulikyo is prepared by peeling cassava roots which are then washed, sliced into two or three big pieces and placed in a cooking pot. Water is added and left to boil until cooked. It is served with tea or milk for breakfast.

2.3.Raw cassava

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Ground chilli	As required.
Salt	As required.

Raw cassava is prepared by peeling, washing and slicing cassava roots into four or more small pieces. The pieces are spiced with a mixture of salt and ground chilli and eaten as a snack.

3. Lua tribe of the Nyanza province

3.1.Ugali or Kuon

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Maize, sorghum, or finger millet	50% cassava.
Smoked fish, or smoked meat or okra soup	As required.

Fresh cassava roots are peeled, washed and sliced into chips which are then sundried for a period of one to two weeks. The dried chips are mixed with either dried maize, sorghum, or finger millet at a ratio of 2:1 and the mixture is milled into a fine flour. The flour is put in boiling water and stirred into a semi-solid porridge called *ugali* or *kuon* which is then served with either smoked fish, smoked meat or okra soup.

3.2.Busaa (a local beer)

Ingredients	Amount
Cassava chips	2 kg.
Water	40 l.
Maize	8 kg.
Pre-germinated sundried finger-millet	4 kg.

Cassava roots are peeled, washed and sliced into chips, placed and stored in a tightly closed darkroom. The cassava is removed from the sack after one week and sundried for a period of 14 days. The dried cassava is then mixed with dry maize and pre-germinated finger-millet which has been sundried for two weeks. The mixture is milled into flour and prepared into *ugali* or *kuon*. The *ugali* is

broken into small pieces which are then sundried for 3 weeks then milled into flour. The flour is placed in a big earthen pot where 40 l of water is added, stirred and boiled to produce a light porridge or gruel called *busaa*. After cooling the *busaa* is ready for drinking. It has been locally nicknamed two-in-one; it is a beer as well as a food.

3.3. Mariwa (boiled cassava)

Ingredients	Amount
Cassava roots	As required.
Water	1 l.
Salt	To taste.
Pumpkin or banana leaves	As required.
Sour milk, milk or tea	As required.

Cassava roots are peeled, washed, split into two pieces with the central pith removed and placed in a pot with 1 l of water (strictly one litre to prevent the cassava from absorbing water and becoming watery). Salt is added and the pot is covered with either pumpkin or banana leaves on top of which a metal lid is placed and sealed with cowdung to become air-tight. It is left to boil for about 30 min after which it should be properly cooked. *Mariwa* is served with sour milk or milk for either lunch or supper or with tea for breakfast.

3.4. Kuogo

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Maize	As required.
Millet, sorghum or maize	As required.
Fish, green vegetables or any stew	As required.

In the preparation of *Kuogo*, cassava roots are peeled, washed, placed in a sack or large baskets and stored in a dark cold room for a week. During storage, the cassava roots develop moulds and become soft. The roots are removed from the sacks and crushed into small pieces, spread and sundried for a period of 7 to 14 days. The dried roots are mixed with either millet, sorghum or maize and milled into fine flour which is added into boiling water, stirred and prepared into either light porridge (*Nyuka*) or thick porridge (*ugali*). The *ugali* is served with fish, green vegetables or any stew.

3.5. Chapati

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Maize	As required.
Millet, sorghum or maize	As required.
Tea, fish, green vegetables or any stew.	As required.

The flour obtained in the preparation of *Kuogo* is mixed with wheat flour and kneaded into a dough. Small balls of the dough are spread into thin disks which are then fried in oil to produce chapati. *Chapati* is served with tea for breakfast or with fish, or any stew for lunch or supper.

3.6. Kuogo

Ingredients	Amount
Cassava roots	As required.
Water	1 l.
Salt	To taste.
Pumpkin or banana leaves	As required.
Sour milk, milk or tea	As required.

Cassava roots are peeled, washed, split into two pieces and the centre pith removed. The cassava pieces are placed in a pot with water and boiled until soft or completely cooked. Cooked cassava is then mashed or pounded into fine balls and served with fish or any stew.

3.7. Ugali

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Millet	As required.

This dish is prepared for someone going on a long journey. Cassava roots are peeled, washed, sliced into small pieces or chips and dried for a period of 7 to 14 days. The dried pieces are mixed with finger millet at a ratio of 4:1 and milled into fine flour. The flour is added into boiling water, stirred and prepared into either light porridge (*Nyuka*) or thick porridge (*ugali*). The *ugali* may be served with fish, green vegetables or any stew.

4. Baluhya tribe of the western province

4.1. Ugali or Obusuma

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Millet, maize or sorghum	As required.
Fish, meat or any green vegetable	As required.

Cassava roots are peeled, washed and sundried for about 6 hours to get rid of excess moisture. The semi-dried roots are heaped in a corner of the kitchen and covered with a sack, a piece of cloth or canvas for a period of 3 to 5 days. The mould formed during this period is scrapped off with a blunt knife and the soft roots are put on a clean floor and crushed with stone into big soft pieces. The soft pieces are sundried for a period of 12-14 hr. The dried roots are mixed with either sorghum, finger-millet, or maize and milled into flour. Alternatively the dried roots may be milled into flour without any cereal. The cassava : millet or sorghum ratio is usually 4:1 and cassava : maize ratio is 2:1. A cassava : maize mixture is not popular. The flour is added to boiling water and stirred until it cooks into either *ugali* (thick porridge) or *uji* (light porridge). The *uji* is a beverage while the *ugali* is served with either fish, meat or any green vegetable.

4.2. Boiled cassava

Ingredients	Amount
Cassava roots	As required.
Water	1 l.
Salt	To taste.
Tea or light porridge	As required.

Cassava roots are peeled, washed, chopped into small pieces, placed in a pot with water and boiled soft or completely cooked. Salt is added during boiling and the dish is served with tea or light porridge.

4.3. Roasted cassava

Ingredients	Amount
Cassava roots	As required.
Sour milk, milk or tea	As required.

Unpeeled cassava roots are placed on glowing embers until cooked. The roots are peeled and served with a beverage.

4.4. Infant light porridge

Ingredients	Amount
Cassava roots	As required.
Water	As required.

Cassava roots are peeled, washed, sliced into very small pieces and sundried for 12-14 hours. The dried pieces are ground (not milled) using stone grinders into a very fine flour which is added into boiling water and cooked into a very light porridge. The porridge is then served to young babies.

5. Maasai tribe of the rift valley province

5.1. Boiled cassava

Ingredients	Amount
Cassava roots	As required.
Water	1 l.
Salt	To taste.
Tea or light porridge	As required.

Cassava roots are peeled, washed, chopped into big pieces and boiled water until cooked. The dish is served with tea or milk.

5.2. Roasted cassava

Ingredients	Amount
Cassava roots	As required.
Sour milk, milk or tea	As required.

The cassava roots are peeled, placed on glowing charcoal and roasted until cooked. The cassava is served with tea or milk for breakfast.

5.3. Raw cassava

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Salt	As required.

Raw cassava is prepared by peeling, washing and slicing cassava roots. The pieces are then eaten as a snack in the field.

6. Kikuyu tribe of the central province

6.1. Stewed cassava

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Millet, maize, or sorghum	As required.
Onion	As required.
Oil	As required.
Stew	As required.

Stewed cassava dish is prepared from "sweet" cassava or low cyanide containing varieties. Cassava roots are peeled, split, sliced into small chips and boiled in water until soft or cooked. The cassava is fried with onion in oil after which water is added and the dish is served with any stew.

6.2. Ugali and Ucuru

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Stew	As required.

Cassava is peeled, split, central pith is removed, sliced into small chips and sundried for a period of 3 to 7 days. The chips are milled into flour, added into boiling water and stirred to produce either a thick porridge (*Ngima*) or a light porridge (*Ucuru*). *Ngima* is served with stew while *Uucuru*, a beverage, is served alone.

6.3. Cassava bread

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Stew	As required.
Wheat flour	As required.
Tea	As required.
Stew	As required.

Cassava is peeled, split, the centre pith is removed, sliced into small chips and sundried for a period of 3 to 7 days. The cassava chips are milled into flour

mixed with wheat flour and kneaded into a dough from which bread is baked. The bread is served with tea for breakfast or with any stew for dinner.

6.4. Roasted cassava

Ingredients	Amount
Cassava roots	As required.
Water	As required.
Stew	As required.
Charcoal	As required.

Cassava is peeled, boiled and roasted on charcoal. Alternatively, the cassava is not peeled but placed on burning charcoal and roasted until properly cooked. The charred bits are scrapped off and the cassava is served with tea, milk, any stew or alone.

7. Coastal people of the coast province

7.1 Mashed cassava with milk

Ingredients	Amount
Cassava roots	4 roots.
Salt	To taste.
Water	2 cups.
Onions	3 small ones.
Milk	2 cups.

Cassava is peeled, washed and cut out into small pieces. The pieces are boiled with onions in salted water until done and then mashed together. Milk is added and the dish is then served.

7.2. Cassava meat stew

Ingredients	Amount
Cassava roots	4 big roots.
Salt	one tablespoonful.
Water	As required.
Onions	4.
Meat	0.5 kg.
Tomatoes	2.
Curry powder	one tablespoonful.
Oil	one tablespoonful.
Salt	one tablespoonful.

In preparing the *cassava meat stew*, the meat is washed, cut into small pieces and mixed with curry powder. Onions and tomatoes are cleaned and sliced. Meat is fried with the onions until a golden brown colour is obtained. Salt and water are added to the stew. Cassava is peeled, washed, cut into pieces and added to the meat stew. The mixture is cooked for 30-45 min until soft. Tomatoes slices are added 5 min before serving

7.3. Cassava-bean stew (Kimanga)

Ingredients	Amount
Cassava roots	4 big roots.
Salt	To taste.
Water	As required.
Onions	6.
Tomatoes	3.
Pepper	As required.
Oil or ghee	0.5 cups.
Dry beans	1.5 cups.
Milk	1.5 cups.

In preparing *cassava-bean stew* one may use cowpeas or grams instead of beans. Beans are cleaned, washed and soaked overnight. Cassava roots are peeled and cut into slices. The beans and cassava slices are boiled together until soft and mashed. Onions and tomatoes are also cleaned, sliced and fried in oil. Salt, pepper and milk are added and the mixture is cooked for a few minutes. Season to taste and serve.

7.4. Cassava-fish stew

Ingredients	Amount
Cassava roots	4 big roots.
Salt	To taste.
Water	As required.
Onions	2.
Tomatoes	2.
Pepper	As required.
Oil or ghee	0.5 cups.
Coconut	1.
Fishes	2-4.

Cassava roots are peeled, cut into slices and cooked for 20 minutes. Fish is cleaned and washed as well as onions and tomatoes which are sliced. Cups of thick and thin coconut milk are prepared. The fish is put on top of the cassava slices and onions, pepper, tomatoes and the coconut milk are added. The mixture is cooked until the fish and the cassava are done. Thick coconut cream is added and ladled over the fish. Season to taste and serve. A similar dish involves frying the fish with the onions and tomatoes in a little oil. These are put on top of the boiling cassava and groundnut flour is added instead of the coconut milk. cream. The juice of one lemon is also added. Dried fish could be used instead of fresh fish.

7.5. Cassava leaves

Ingredients	Amount
Cassava leaves	As required.
Salt	To taste.
Water	2 cups.
Onions	1.
Tomatoes	1.
Curry powder	As required.
Oil or ghee	1 tablespoon.
Thick coconut cream	1 cup.
Fishes	2-4.

Cassava leaves are washed, pounded and boiled in salted water for 60 minutes. Onions and tomatoes are cleaned, sliced and fried in oil. Curry powder, coconut cream and the cassava leaves are added. The dish is ready to be served with any carbohydrate.

7.6. Cassava pudding

Ingredients	Amount
Grated cassava	1 cup.
Sugar	1/2 cup.
Grated coconut	2 cups.
Banana leaf	1.

Grated cassava roots are mixed with grated coconut and sugar. A banana leaf is cut into two big pieces and soften over fire. Half of the cassava mixture is put on one piece of the banana leaf, folded and tied. The other package is prepared in a similar manner. Both packages are put in a greased tin or a small pan

and baked in a moderately hot oven until brown. The cassava pudding could either be served hot or cold. A variation in a similar dish involves steaming the pudding instead of baking and groundnut flour could replace the coconut cream.

7.7. Fried cassava

Ingredients	Amount
Cassava roots	As required.
Oil	As required.
Salt	As required.
Pepper	As required.
Lime	As required.

Cassava roots are split into 5-6 pieces and deep-fried in oil. The cooked cassava pieces are spiced with the salt, pepper and lime or lemon to required taste. The dish is served and eaten as a compliment to another meal or as a snack.

Conclusion

Cassava is widely used in Kenya by almost all communities. There is still a lot of room for expansion on its use. Industrialists have yet to fully utilize cassava in stock feed manufacture. The home economics department of the Ministry of Agriculture and other organizations have also a wide room in coming up with cassava recipes acceptable to a larger community. Cassava is more widely used in Kenya than is apparent at a casual glance.

References

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