
COOKING OF SMALL MILLETS IN TAMIL NADU

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Small millets are known for their role as a shield against food and nutritional insecurity especially in harsh agricultural regions. Yet, their cultivation area and production have come down with decline in their consumption. In Tamil Nadu, all the six small millets – Ragi (Finger millet), Tenai (Foxtail millet), Varagu (Kodo millet), Samai (Little millet), Panivaragu (Proso millet) and Kudraivali (Barnyard millet) are in cultivation since time immemorial.

The unique cooking styles of millet grains has formed an important part of an agricultural complex in Tamil Nadu which is rich and varied, encompassing the widest range of climates, religions, wealth, education and languages.

Small millets in Tamil Nadu

In Tamil Nadu, Finger millet is cultivated in an area of 1.18 lakh ha with a production of 1.76 lakh metric tonnes and productivity of 1909 Kg/ha (2003-04). The crop is grown as *kharif* rainfed crop in June – July; *rabi* crop, during September - October and summer irrigated crop in January- February.

Crop utilization is mainly as food grain and straw as valuable fodder. Many kinds of traditional foods are made from the grain and consumed as meal, snack, breakfast and weaning food. The grain contains 7-8 per cent protein. Finger millet is rich in sulphur containing amino acids and richest source of calcium among cereals and millet grains besides having higher amount of the other minerals particularly, phosphorus and iron. Finger millet will continue to have a significant role in the food economy of the people growing this.

The foxtail millet is grown as rainfed crop during June-July and September - October in the western zone of Tamil Nadu in districts of Coimbatore, Madurai, Dindigul, Erode, Salem, and Tirunelveli. The foxtail millet is comparable to rice and wheat in its nutritive value. Its flour is used for making tasty preparations *viz.*, puttu, chapathi, bread, cake, biscuit etc. The grain is widely used as livestock and poultry feed. It is also a feed for the pet birds.

The little millet is grown in Dharmapuri, Salem, Erode, Coimbatore, Madurai and Vellore districts of Tamil Nadu. It is highly tolerant to heat and drought. Little millet is preferred for extreme soil and climatic conditions of tribal agriculture. The average grain yield is 400-600 Kg/ha. The grain is parboiled like rice. Often roti, porridge are made and consumed. It is also made into flour and used for making pudding or cakes.

Kodo millet is grown in rainy season as dryland crop in Tamil Nadu. The crop grows well in shallow soils in districts of Trichy, Cuddalore, Vellore, Ramnad, Salem, Dharmapuri, Madurai and Pudukkottai. Kodo millet is grown predominantly as sole or mixed with redgram, sesamum, niger and blackgram. The traditional methods of dehusking using earthen mortar with wooden pestle and debraning by hand operated wooden pestle still persists. Debranned grain are white to dull white and resembles rice. Industrial utilization of the grains is still to be explored. Medicinally, kodo millet is used in curing inflammation, diseases of liver, dysentery and considered to keep the body warm. As a coarse cereal, kodo millet has largely remained as the food of less privileged section of the population.

Barnyard millet is grown in Ramnad, Tirunelveli, Virudhunager and Madurai districts of Tamil Nadu. It is highly nutritious as the other major cereals. Proso millet is grown in Coimbatore, Erode, Salem and Tirunelveli districts. The dehusked grain is nutritious (9.5 to 12.8% protein) and consumed as cooked rice. Flour is used to make unleavened bread (roti). Value added products such as parboiled, flaked, puffed, expanded, extruded, deep fried grain and even noodles can be prepared from proso millet flour. The grain can be fed to poultry either alone or in combination with maize.

Vernacular names of cereal cooking styles and the daily meal

In Tamil Nadu the staple foods are served with various kinds of curry and legume *dal* stew at every meal. *Sadam* (soru), *Kali* and *Koozhu* are considered to be common traditional ones in Tamil Nadu since ancient times. Chapathy, nan, roti and parota made from wheat flour had been introduced from the north-west regions to Tamil Nadu. *Idly*, *dosai* and *paniyaram* made from fermented rice and blackgram wet ground flour are the most popular breakfast snack foods in Tamil Nadu. At every breakfast Tamilians eat *idly* and *dosai* with *chutney* and /or *sambar*. Now these food items are made from ragi flour also after realizing their nutritional value. During summer especially *kali* and *koozhu* are taken along with curd or buttermilk with raw onion and pickles. At lunch they eat *sadam* with dal stew and many kinds of curry. At supper they eat *idly* or *dosai*, *sadam* is also taken; *uppuma*, *sevai* made from *ragi*, *samai* or *varagu rice*

also common food preparations. Chapathy some times is eaten at breakfast or supper made from either wheat flour or mixed flour of wheat and small millets. Millet cooking styles prevalent in Tamil Nadu is given in Table-1.

Small millet grain crops cookery

(a) Sadam

In Tamil Nadu *sadam* a kind of boiled grain is made from so many cereals and millets. Sadam made out of rice is the most popular. It is also made from dehusked little millet, kodo millet, barnyard millet, foxtail millet and proso millet. While processing grains are dehusked as 'raw' rice or 'par-boiled'. The par-boiled method may be considered one of the oldest processing techniques for cereals, especially for small millet grains. "Par-boiled" means preboiling raw grains before polishing them. By this process the grain can be easily polished without breakage, the nutrients contained in the seed coat permeate into the endosperm and then the polished grains are in a very good condition for eating.

Sadam is eaten with many kinds of curry, *dal stew*, *sambar*, *rasam*, *pickles*, *curd*, *salt*, *plant oil* with *podu* and so on. There are many variations of rice *sadam* viz., *pulav*, *biryani*, *kootansoru* and *pongal* which are often special festival foods in Tamil Nadu.

(b) Uppuma

Uppuma is made from ground coarse grains. This is eaten mostly at breakfast and at times during supper. It is a spicy nice smelling food and taken with chutney, curd or pickles.

Recipe

Ingredients

Broken coarse grain	-	100g
Cut onion	-	25 g
Cut tomato	-	25 g
Cut green chillies	-	3 No.
Cut vegetables (optional)	-	50 g
Ginger paste	-	1 teaspoon
Mustard seed, Bengalgram dal and blackgramdal	-	1 tablespoon
One bunch of curry leaf and a handful of coriander leaf, salt for taste.		

Method

1. Season oil with mustard seed, bengalgram and blackgram dal in a cooking pan.
2. Fry ginger paste, onion, green chillies, curry leaf and tomato.
3. Add cut vegetables.
4. Pour one cup of water.
5. After boiling add salt to taste and slowly add broken coarse grain.
6. Under low flame mix it thoroughly without any lumps and cover it with lid.
7. After 5-10 min. put off the flame.
8. Serve with coriander leaf garnishing.

(c) Idly and dosai

Idly is a leavened poundcake made from fermented batter, the basic ingredients of which are ground par-boiled rice or ragi flour, blackgram dal and a small quantity of fenugreek.

Dosai is a thin leavened pan cake made from the same ingredients as *idly*. *Dosai* is stuffed with different vegetable, mushroom or potato curry or dipped in sambar and chutney. *Idly* is eaten with *sambar* and *chutney*. However, *idly* is a steamed food, while *dosai* is fried.

Ragi idly

Ingredients

Ragi	-	75 g
Parboiled rice	-	25 g
Blackgram dal	-	25 g
Fenugreek seed	-	1 tea sp.
Water	-	400 ml
Salt	-	to taste

Method

1. Soak ragi, parboiled rice, blackgram dal and fenugreek seed for 6 hours and grind into fine paste.
2. Ferment overnight, add salt and mix it thoroughly.
3. Apply a teaspoonful of oil to the idly making plates and pour idly batter.
4. Steam in idly cooker
5. Serve warm with *sambar/chutney*.

Ragi dosai

Ingredients

Ragi	:	75 g
Parboiled rice	:	25 g
Blackgram dal	:	25 g
Onion	:	100 g
Fenugreek seed	:	1 tea sp.
Water	:	400 ml
Salt	:	to taste
Green chillies	:	3 -4 nos.
Coriander leaves	:	a bunch
Oil	:	150 ml

Method

1. Add chopped onion, green chillies and coriander leaves to the batter and mix it well.
2. Apply little oil to the frying pan and put two table spoon of batter.
3. Spread it round and shallow fry.

(d) Kali and Koozhu

Kali (Stiff porridge) and *Koozhu* (Thin porridge) are the kind of starch paste made from millet flour and have been the most popular and traditional cooking ways. *Koozhu* is a kind of very thin starch paste from the same ingredients as kali but requires a larger volume of water at boiling than kali. This food is cooked in the evening and eaten with butter milk and salt in the next breakfast.

Kali ingredients

Ragi or other millet flour	-	100 g
Water	-	200 ml
Salt	-	to taste

Method

1. Boil water with 2 pinches of salt.
2. Add ragi/grain flour to it with through mixing and allow it to cook for 15 minutes on low flame.
3. Mix it well to see that there are no lumps,
4. Make into balls.
5. Serve hot with curry, green or sambar.
6. Or serve cool with curd or butter milk.

(e) Mavu

Mavu is a kind of raw flour ball mixed with jaggary / sugar / honey. It is made from the flour of foxtail millet by rural communities in Tamil Nadu. This food is first offered to the gods and goddesses and there after eaten.

(f) Chapathy and Roti

A form of Indian bread and most familiar among people. Roti is an unleavened bread which is made from whole grain flour such as wheat, ragi, rice and other small millets. The roti / chapathy is eaten with curry and dal stew.

Roti - ingredients

Ragi / millet grain flour	-	100g
Bengalgram flour	-	25 g
Onion	-	50 g
Drumstick leaves	-	20 g
Curry leaves	-	5 g
Coriander leaves	-	10 g
Green chilly	-	4 Nos.
Cumin seeds	-	1 tea sp.
Salt	-	to taste
Oil	-	50 ml

Method

1. Mix ragi/ millet grain flour, bengalgram flour, chopped onion and chillies, drumstick leaves, coriander leaves, curry leaves, crushed cumin seeds and salt.
2. Make soft dough with required quantity of water.
3. Take small quantity of dough and spread it round on a wet cloth.
4. Transfer and shallow fry on the pre-heated tawa with little quantity of oil.

(g) Noodles / Semia / Sevai / Vermicelli

These are made from ground ragi or other whole grain flour. The wet dough is pressed through perforated bottom, dried and steamed or boiled for cooking. Either it is seasoned with onion, green chillies, curry leaves, coriander leaves and lemon juice or mixed with grated coconut, jaggery and cardamom powder.

(h) Puttu

It is one of the traditional preparations and made from roast ragi or millet flour on sim fire. The flour is slightly moistened with little water and a pinch of salt and steamed in puttu making vessel for 15-20 minutes. *Kharaputtu* is seasoned with onion, chillies, grated carrot, coconut and coriander leaves. Sweet puttu is mixed with grated coconut, jaggery and cardamom powder.

(i) Other fried foods

Vadai: is a round flat cake made from freshly ground millet flour, spiced with chillies, ginger, onion, coriander leaves and deep fried to a golden brown colour in groundnut oil. *Bonda* and *Pakkoda* are also flour snacks which are spicy and deep fried in oil. *Murukku* is a millet and dal flour snack in the shape of coils, molded by hand and deep fried in oil.

Apart from these traditional foods, special foods such as *payasam*, *halwa*, *seedai* and *keer* are also made from small millets.

Table 1 : Millet cooking styles and their ingredients in Tamil Nadu

Sl. No.	Millet	Recipies													
		Sadam	Uppuma	Chapathy	Rotti	Idly	Dosai	Kali	Kulu	Puttu	Sevai	Mavu	Murukku	Pokkoda	vadai
1.	Finger millet	-	√	√	√	√	√	√	√	√	√	-	√	√	-
2.	Little millet	√	√	-	-	-	-	-	√	-	-	-	-	√	-
3.	Kodo millet	√	√	-	-	-	-	-	√	-	-	-	-	√	-
4.	Barnyard millet	√	√	√	√	-	-	-	√	-	√	√	√	√	-
5.	Foxtail millet	√	√	√	√	-	-	-	√	-	-	-	-	√	-
6.	Proso millet	√	√	-	-	-	-	-	√	-	-	-	-	√	√

VALUE ADDITION TO FINGER MILLET FOR NUTRITIONAL SECURITY OF TRIBALS IN JHARKHAND

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Finger millet (*Eleusine coracana*) locally called “*Mandua*’ is the second most important grain crop after rice in rainfed farming system of Jharkhand. Finger millet being nutrient rich is one of the best sources of nourishment and provide cheap source of quality proteins, minerals and vitamins. The carbohydrate of finger millet has the unique property in having starch molecules which are relatively slow in absorption when consumed as food. This property of finger millet grains has an added advantage of being a recommended food in the management of diabetes. The grain also has high fiber content and helpful in prevention of constipation. In spite of having many unique nutritional qualities, its consumption is very much restricted to rural population. There is a stigma attached to finger millet considering grain as coarse. The brown or light black color of food made of finger millet perhaps is acting as deterrent to many consumers. Only four or five food products are made from ragi among tribals in Jharkhand.

Roti : Dough is made with required quantity of water, divided, flattened and roasted on heated iron pan.

Chilka : Thick batter of ragi flour with water is prepared and shallow fried on the preheated iron pan.

Dumbu : Ragi flour is added to boiled water and allowed to cook. It is mixed thoroughly to avoid lumps. Dough is divided and balls are made which is either steamed or boiled in water.

Lato : It is a type of *kitchri* in which ragi flour is cooked with rice. Ragi flour is added to half cooked rice and stirred continuously till done. Salt is added for taste.

Patta Ka Roti/Thapara : As name indicates when *roti* is prepared on sal leaves, it is called *patta ka roti*. Soft dough is prepared and is spread on sal leaf. Then it is covered with another sal leaf and roasted on heated *tawa*.

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Tender leaves : Tender leaves of ragi plant are also eaten as such by local tribals farmers.

Tender ragi pakodas : Consumption of tender ragi are also popular among tribals during season in the form of *pakodas* and curry.

Millets in Jharkhand have received little attention in all areas of production, processing and utilization. Production and consumption has declined due to urbanization, changing food preferences and availability of fine cereals at subsidized price.

The cropped area under millets has decreased significantly as more focus was paid to rice and wheat. However, change in rainfall pattern both in distribution and quantity with more frequent dry spells of varying durations and almost regular failure of hattia rains during the last two decades have compelled farmers to reconsider crop option especially ragi which has wide range of tolerance against biotic and abiotic stresses. The food use is very much limited due to lack of diversification and non-availability of value added products. Diversified utilization and development of value added products will promote market demand which in turn will result in better return to farmers. Keeping this in view many value added products of ragi were developed in Birsa Agricultural University and exposed to both rural and urban people during many training cum demonstration programmes, Kisan Melas and exhibitions. Some of the value added food products being popularized are:

1) Ragi cake

Ragi flour	:	30 g
White flour	:	70 g
Sugar	:	100 g
Fat	:	100 g
Baking powder	:	½ teaspoon
Egg	:	3
Vanilla essence	:	½ teaspoon
Cherry	:	As per taste

Method

1. Separate the egg white and yolk.
2. Beat the egg white with half of sugar.
3. Cream butter, half of sugar, yolks and baking powder.

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4. Fold the beaten eggs in the creamed mixture.
 5. Fold Maida and pour the mixture into tin and bake at 160°C till brown (Fig. 1).

2) Nan khatai

Maida	:	75 g
Ragi flour	:	75 g
Ghee	:	120 g
Sugar	:	115 g
Curd	:	1 tsp.
Soda	:	¼ tsp.
Ammonium bicarbonate	:	1 tsp

Method

1. Cream ghee and sugar.
2. Add ammonium bicarbonate and curd in the above mixture.
3. Add sieved flour and knead.
4. Divide the mixture into small portions and form into balls.
5. Place on the greased baking sheet and leave for an hour.
6. Bake at 130°C to 140°C until brown (Fig. 2).

3) Idli

Ragi	:	100 g
Rice	:	100 g
Urd dal	:	100 g
Salt	:	As per taste

Method

1. Soak ragi, rice and urd dal separately for 6-8 hours.
2. All three ingredients are ground into thick paste.
3. Mix together and kept overnight for fermentation.
4. Salt is added and batter is poured into greased Idli stand and steamed for 7-8 minutes (Fig. 3).

4) Ragi Dhokla

Ragi	: 50 g
Bengal gram dal	: 50 g
Black gram dal	: 50 g
Curd	: 50 g
Ginger and green chilli paste	: 5 g
Haldi	: ¼ tsp.

Seasoning

Mustard	: 1 tsp.
Salt	: As per test
Curry leaves	: 2.5 g
Sugar	: 1 tsp.
Oil	: 1 tsp.

Method

1. Soak ragi, bengal gram dal and blackgram dal for 6-8 hr.
2. Grind into thick paste.
3. Mix together and keep overnight.
4. Next day add curd, salt, ginger and green chilli paste, sugar and haldi.
5. Pour the batter into greased pressure cooker container and steam immediately.
6. Separately season with seasoning ingredients.
7. Cut the steamed batter into pieces, garnish with coriander leaves.
8. Serve *dhokla* with coriander or Tamarind chutney (Fig. 4).

5) Halwa

Ragi	: 50 g
Besan	: 50 g
Sugar	: 70 g
Ghee	: 60 g
Water	: As per requirement
Cardamom	: 1 pinch powder

Method

1. Fry ragi flour and besan till brown.
2. Add sugar, cardamom powder and water.

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3. Boil it over low flame with frequent stirring.
 4. Cook till the ghee started leaving sides of the pan (Fig. 5).

6) Ladoo

Ragi flour	:	50 g
Besan	:	50 g
Groundnut	:	25 g
Ghee	:	90 g
Sugar	:	70 g

Method

1. Sieve ragi flour and besan.
2. Roast flour in a pan till light brown colour.
3. Roast groundnut and powder it.
4. Add ground sugar and ghee in it and mix well.
5. Remove from fire and made into balls like ladoos (Fig. 6).

7) Nimki

Ragi flour	:	50 g
White flour	:	50 g
Ajwain	:	½ tsp.
Salt	:	To taste
Oil	:	For frying

Method

1. Mix sifted flour, salt and ajwain.
2. Rub in a little fat to give a bread crumb appearance.
3. Make a stiff dough with water.
4. Divide into equal portion and roll.
5. Cut length wise, then width wise into pieces.
6. Deep fry on a very slow fire till golden brown in colour.

8) Muthia

Ragi flour	:	100 g
Besan	:	25 g
Wheat flour	:	25 g

Curd : 50 g
Chopped coriander leaves, methi, ginger, haldi, mustard : To taste.
zeera, salt, chilli powder

Method

1. Add all spices, chopped coriander leaves and methi to flour except mustard.
2. Make a stiff dough by kneading.
3. Divide into equal portion and make long and thick muthia.
4. Steam for 20 minutes.
5. Cut into pieces and season with hing, mustard and sesame seed.

9) Kheer

Geminated Ragi : 25 g
Ghee : 1 tsp.
Milk : 1 litre
Sugar : 50 g
Cardamom powder : 2 g

Method

1. Melt ghee in a pan.
2. Fry germinated ragi for few minutes.
3. Boil milk and add fried ragi.
4. Add sugar and cardamom powder.
5. Cook till ragi becomes soft.
6. Remove from fire, serve cold.

10) Poushtik roti

Ragi flour : 50 g
Soya flour : 25 g
Wheat flour : 50 g
Onion : One medium size
Drumstick leaves : 20 g
Salt : To taste
Ajwain : To taste

Method

1. Mix ragi flour, soy flour, wheat flour, chopped onion, drumstick leaves, coriander leaves, salt and ajwain.
2. Make soft dough with required quantity of water.
3. Portion the dough and roll.
4. Shallow fry on preheated *tawa*.

11) Papad

Black gram dal flour	:	200 g
Ragi flour	:	200 g
Salt	:	15 g
Papad khara	:	15 g
Hing	:	1 g
Black pepper	:	10 g
Oil	:	15 ml

Method

1. Sieve ragi flour and black gram dal flour.
2. Add papad khara, salt, coarsely ground pepper, hing, oil and knead to a soft dough with water.
3. Leave the dough for ½ hr. for proper dough development.
4. Knead once again with oil.
5. Divide the dough into small balls and press in papad press to get a thin circular disc of about 1 mm thickness.
6. Dry in sun or shade.



Fig 1: Ragi Cake

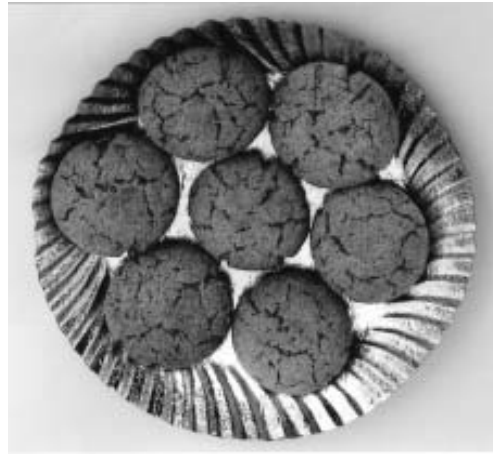


Fig 2: Nan Khatai



Fig 3: Ragi Idli

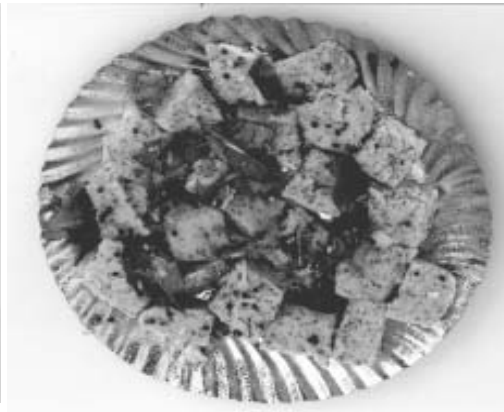


Fig 4: Ragi Dhokla



Fig 5: Ragi Halwa



Fig 6: Ragi Ladoo