



Mahasamvit International Ltd.

Millets

India produces all the nine commonly known millets and is the largest producer and the second largest exporter of millets in the world. Millets are termed as Nutri-cereals because of their high nutritional qualities and also a crop suited for the changing climate. It has been an integral part of diet in the past owing to its nutritional, functional and nutraceutical properties. Though millets are known as super food, the consumption and also the production were declined over the past decades and millet processing neglected. The main reason behind this is the lack of awareness of its nutritional properties, low knowledge on the method of cooking, non-availability of suitable processing technologies or machinery, non-availability of Ready to Eat (RTE) and Ready to Cook (RTC) products besides millets being perishable with low shelf life and the processing and cooking being laborious, and time-consuming.

A step towards to create demand and to promote millets from farm to plate, ICAR-Indian Institute of Millets Research (IIMR) has taken an initiation and developed diversified millet recipes for breakfast, lunch, snacks, beverages and etc. to include in our daily diet. These tasty and healthy millet recipes will increase the consumption can also reduce the malnutrition in the general public. Millet promotion can also be done through Public funded schemes like ICDS and Mid-Day Meal programmes.

With International Year of Millets - 2023 around the corner, millets take its center stage in various occasions through the address by the Hon'ble Prime Minister of India. This is the time for revive millets for nutritional security not at national level but beyond national boundaries. It has become imperative to reorient the efforts on the millet crop to generate demand by creating awareness about the cooking of millets to enhance the consumption pattern of millets among the masses; this book is really helpful. I congratulate ICAR-IIMR in bringing out this publication, Millet Recipes- A Healthy Choice aiming in diversification of millet consumption and thus creating demand for millet production. I hope this book is expected to serve as one stop solution for millet recipe for households, entrepreneurs and other stakeholders alike

Millets are important crops for dryland farmers; they are highly nutritious and are a climate-compliant crop. But overall millets consumption in India has declined over the years. In order to revive the demand of millets in India, the ICAR-IIMR has made an attempt to innovate technologies that enable in developing millets based value added products.

In this present era, consumers prefer high-quality and healthy foods with longer shelf life. They also look for products which are convenient to prepare as people are too busy in their daily schedule. Moreover, people have increased their tendency to eat a greater variety of foods both traditional and conventional. Efforts are being made to develop millet based products and recipes to create awareness on the potential health benefit of millets which are recommended for obese, diabetic, celiac and other lifestyle diseases. In order to make millet value chain sustainable, the production and promotion of various products in the market is very much essential. Under this motto, we are promoting more than 100 startups who are into millets connecting with consumers and engaged to promote the millet based products. Our efforts are now focused on developing millet recipes that are quite popular in various countries as a run up to the event of launching 2023 as International Year of Millets, in order to introduce this millets to the international community as health & nutrient rich recipes with taste.

This book comprehensively deals with the millet based recipes and their methods made it easy for usage of millets in to our daily diet to get balanced and healthy diet with millets. We are sure that this publication will be a useful document for all the households and food entrepreneurs as it included traditional and non-traditional food items that can replace regular rice and wheat recipes. Particularly in urban areas where there is considerable demand for nutrient rich and ready to cook foods, this publication may be valuable.

Sorghum



Pearl Millet



Finger Millet



Foxtail Millet



Koda Millet



Barnyard Millet



Proso Millet



Little Millet





sorghum - joar pearl millet – bajra, finger millet- mandua (ragi) , little millet-kutki , kodo millet- kodon, foxtail millet- kangni kakum, Barnyard millet-Sanwa, Jhangon. Proso millet- barre

Bengali	Juar	Bajra	Mandua	Kangani	Kodo	Kaon	Shamula
		Cheena					

They contain high amounts of dietary fibre, B-complex vitamins, essential amino and fatty acids and vitamin E. They are particularly high in minerals, iron, magnesium, phosphorous, potassium and release lesser percentage of glucose over a longer period of time causing satiety which lowers the risk of diabetes. These grains are high in carbohydrates, with protein content varying from 6 to 11 percent and fat varying from 1.5 to 5 percent.

Millets are typically annuals and range in height from 30 to 130 cm with the exception of sorghum and pearl millet, which has stalks 1.5 to 3 m tall and about 2.5 cm thick. The inflorescences may be spikes or racemes, in which the flowers are borne on stalks of about equal length along an elongated axis, or panicles with dense clusters of small florets. With the exception of pearl millet, seeds remain enclosed in hulls after threshing. Hulled seeds are usually creamy white.

In India, millets have been a staple diet and a main source of income for farmers especially in the semi-arid regions. They are important food and fodder crop in the semi-arid tropics (SAT) of the world and grows in both *kharif* and *rabi* seasons. These grains represent the major source of dietary energy and protein for more than a billion people in the semi-arid tropics.

SORGHUM

Scientific name: *Sorghum bicolor* (L.) Moench.

Hindi name: Jowar; **Telugu name:** Jonnalu; **Kannada name:** Jo/a

Sorghum is traditional staple food of the dry land regions of the world, a warm season crop intolerant to low temperatures, resistant to pests and diseases highly nutritious and a climate-compliant crop.

It ranks fifth in cereals produced world-wide and fourth in India. Generally, sorghum grains act as a principal source of protein, vitamins, energy and minerals for millions of people especially in the semi-arid regions playing a crucial role in the world's food economy. It has a nutritional profile better than rice which is the

staple food of majority of the human population for its rich protein, fibre thiamine, riboflavin, folic acid, calcium, phosphorous, iron and -carotene.

Sorghum is rich in potassium, phosphorus and calcium with sufficient amounts of iron, zinc and sodium. Due to this, it is being targeted as a means to reduce malnutrition globally. It helps to control heart problems, obesity and arthritis.

Recipe 1- sorghum bites .



SORGHUM BITES .

Ingredients.

Sorghum flour- 200 gram , maida- 200 gram, butter- 10 gram , sugar-5 gram, salt -10 gram, water -250ml,

Preparation Method:

Mix all the ingredients along with water and knead it well to form the dough.

•Keep it for 15 minutes in the refrigerator.

Divide the dough into small portions large pooris out of it.

Now cut these raw pooris into desired shapes like squares or diamonds.

meanwhile, preheat the oven at 250 °C for 20 minutes.

Bake the square or diamond-shaped Sorghum bites at 250 °C for 25 minutes.

Cool it and serve it as a healthy snack.

Recipe 2- sorghum burelu



Ingredients

Sorghum flour- 100 gram, maida- 40 gram, jaggery (tal gur) -50 grams , elaichi (cardamom), or sompu (mouri) (fennel seeds) 50 grams –

Preparation method-

- To a large bowl, add grated jaggery and 100 ml of water to make the jaggery syrup by boiling it for 5-10 min.
- Now add both flours like sorghum flour and maida in the jaggery syrup and mix them evenly.
Meanwhile, take a pan and heat the oil over medium flame for deep frying
make it into round balls and deep fry the balls.

- Transfer the Sorghum Burelu into oil absorbent paper to remove the excess oil.
- Serve hot as traditional snacks.

Recipe 3- sorghum Dilkush



Ingredients-

Sorghum flour- 40 grams, maida -60 gram, dry east- 5 gram, sugar-5gram, butter-30 gram, milk-100 gram,

For stuffing- tutti frutti red 50 gram, tutti frutti green- 50 gram, cherries chopped 20 gram, coconut powder- 30 gram, sugar- 60 gram, raisins -10 in numbers, cashews - 10 in numbers, cardamom -10 in numbers, make it powder, and mix 15 gram butter.

Preparation method-

- 1. Firstly do the yeast activation
by adding**
- 2. Add sorghum flour &**

5 Make a circular & thick sheet, place the small a

remaining milk to
minutes at room temperature
to make

3. Now, prepare the stuff by
mixing all the

4. Take the dough and make it
into a

roll it properly. Coat the sorghum the activated yeast
6. Meanwhile, preheat the oven at 180 °C the soft dough
7. Bake the sorghum dilkush at 180 °C ingredients given
8. Cool and serve as a sweet based healthy round s

Recipe 4

Sorghum potato idly.

Ingredients

Raw potato- 1 in number, sorghum instant idly mix- $\frac{1}{2}$ packet, oil- 2 tsp, mustered oil-1tsp, red chilli powder - pinch, sesame seed- pinch, turmeric powder- $\frac{1}{2}$ tsp, salt- $\frac{1}{4}$ tsp.



Preparation method

- **Boil potato in excess water and make it into potato paste.**
- **Prepare Instant Sorghum Idli batter and rest it for 5 minutes.**
- **Now add the mashed potato to the above Sorghum batter.**
- **Mix the batter once again and pour a spoonful of batter into each of the greased idli moulds.**

steam it for 15-20 minutes under medium flame and de mould them with a table teaspoon.

- Take a shallow frying pan with oil and heat it for 5 minutes for seasoning. Add mustard seeds, sesame seeds, turmeric, salt, red chili powder, and place the seasonings on the sorghum idli.
- Serve hot with coconut/ tomato chutney as a healthy breakfast.

Recipe 5

Sorghum kulfi

Ingredients

Sorghum milk-100 gram, regular milk- 100 gram, milk powder-50gram, sugar-30 gram. Corn flour- 10 gram, cardamom powder- 2 gram, citric acid-pinch, cashew almonds and pistachio- 10 grams.



Preparation Method:

- Soak the sorghum grains overnight and make 25 g of the above mix, add grind the grains
- Now extract the milk by using the make a thick consistency by cooking. muslin cloth.
 - After extraction, keep the milk aside. keep freezing overnight.
 - Blend the milk powder, Sugar, corn all dry fruits and make the mix.
 - Serve as a healthy, delicious dessert. flour, citric acid

Recipe 6

Sorghum piri piri French fries .

Ingredients

Sorghum idly rawa-150 gram, mashed potato- 100 gram, chat masala -5 gram, salt- 10 gram, piri piri mashala as required, water-225 ml.



Preparation Method:

- Pour water in the vessel and boil water until the bubble nature comes.
- Add sorghum idli rawa, salt and chat masala to the boiled water and cook for 3-4 minutes.
- Knead into the dough by adding boiled, mashed potato, a pinch of salt and chat masala (required for Potato).
- Make equal portions of the dough. Roll each portion on a flat surface.
- Cut the dough into rectangular shapes (like stripes) by using a knife.

reheat the oil for deep frying; add a few millet dough stripes at a time and deep fry these sorghum stripes in hot oil for a few minutes heat or until they are lightly browned on both sides on medium.

- Put this sorghum French fries on the butter paper.
- Sprinkle the Piri Piri masala powder on the Sorghum French fries.
- Serve as a healthy and yummy snack with tomato sauce.

Recipe- 7

Sorghum idli burger

Ingredients

For millet batter- sorghum idly rawa- 60 gram,

Wheat upma rawa- 50-gram, curd- 40 gram, eno 40 gram, salt as required,

For stuff- boiled and mashed potato 3 in numbers, green chille -3 in numbers, amchur powder- 2 gram, coriander powder- 2 gram, red chili powder-2 gram, turmeric powder-2 gram, mustard seeds- 1/4th tsp, salt as required for taste, oil- ½ tsp.



Preparation Method:

A. Stuff preparation

Heat 1 tablespoon oil in a pan and add mustard seeds in it. Put chopped green chili, a pinch of salt, turmeric powder, red chilli powder, amchur powder, and coriander powder.

Cook the masala for 1 minute and add mashed potatoes.

Cook for 2 minutes and cool it.

Take the above potato stuff and make a lemon size balls.

Slightly press the balls into circular patties and keep aside on a plate.

B. Millet Idli preparation

Add the millet idli rawa, wheat upma rawa, and salt., in a large bowl.

Also add curd, water and make it into a batter.

add eno powder to the batter.

On a high flame, bring enough water to boil in an idli steamer.

Grease your idli plates lightly with oil. Mix the batter gently for a few minutes. Fill the molds with the batter.

Place the molds in the steamer and close it. Steam it for 15-20 minutes.

Cool it for a while and cut the Sorghum idlis into horizontal halves.

Keep the potato stuff between the sorghum idlis and shallow fry the Idlis with Oil. Additionally can add vegetables and mozzarella cheese slices also.

Serve as a healthy breakfast or snack.

Recipe 8

Sorghum suji fingers

Ingredients

Sorghum idly rawa- 50 gram, curd 25 gram, baking soda -1gram, salt -10 gram, chillis – 4 in numbers, sesame seeds 1tsp



Preparation Method:

- Make a batter by adding sorghum idli rawa, curd, salt, crushed garlic, baking soda, and water.
- Pour the batter in the square shape bowl and steam it for 20 minutes.
- Cool and cut it into a long and rectangular shape. now add 1 tsp of oil in the pan and add mustard seeds, sesame seeds, curry leaves.
- Add Sorghum suji fingers and do shallow frying for 5 minutes.
- Serve with peanut chutney or coconut chutney.

Recipe 9

Sorghum haleem

Ingredients

Sorghum idly rawa- 150 gram, sorghum flakes -50 gram, soya chunk-40 gram, red gram dhal- 10 gram, black gram dhal- 10 gram, red lentils 10 gram, oats 30 gram, milk – 60 gram, pepper 5 gram, ghee-50 gram, almonds -20gram, cashew nuts- 20 gram, pistachio nuts- 20 gram, brown onion-3 pieces, carrots -100 grams, beans-100 grams, lemon juice- 1 in number, green chillis -6 in numbers, rose petals- 1 rose in number, caraway seeds/ shajeera -1 tsp ,long pepper-4 in number, oil-200ml, salt as required, bay leaves -4 in number, garlic paste-1tsp, red chili powder- 1tsp, coriander leaves -1 bunch, mint leaves-1/2 bunch, water as required.



Preparation Method:

- Firstly, soak the soya chunks and sorghum idli rawa for 30 minutes separately and keep aside.
- Afterwards, grind the red gram dhal, red lentils, sesame seeds, bengal gram dhal, black gram dhal, oats, pepper, almonds, cashew nuts, and pistachio into a powder separately.
- Keep this dhal-dry nuts powder aside.
- Boil the carrots, beans and make it into a paste by mashing.
- Add ghee in the cooker, along with caraway seeds, cinnamon, long pepper, green chilies, bay leaf, brown onions, and sorghum idli rawa, saute for 5-7 minutes.
- now add soya chunks paste, dhal-dry nut powder, and vegetable paste to the above and saute the mixture.
- Also, add garlic paste, red chilli powder, salt, garam masala powder, and required water.
- Add the coriander leaves, mint leaves, Oil, and ghee to the above mixture.

- Lastly, add brown onions, cashew nuts, and mint leaves to the Haleem. Cook for 5 whistle's in the pressure cooker.
- Serve hot as a healthy and ethnic dish.

Recipe 10

Sorghum eggless rawa cake-

Ingredients

Sorghum idli rawa-80 gram, wheat upma rawa/suji-20 gram, sugar powder-100 gram, baking powder- 5 gram, baking soda-1 gram, milk-100 gram, curd-100gram, vegetable oil-50gram, salt pinch,



Preparation Method:

- Firstly, mix idli rawa, wheat upma rawa, sugar powder, baking powder, baking soda, milk, oil & salt in a bowl and mix well.
- Keep it aside and rest it for 30 minutes.
- Afterwards, add curd in the above mixture and make it into a cake batter.
- Preheat the oven at 200 °C for 15 minutes. meanwhile, pour the above millet cake batter in a greased mold.
- Keep the molds in the oven and bake at 210 °C for 30 minutes.

- Cool them at room temperature.
- Serve as millet bakery snacks.

Recipe 11

Sorghum eggless chocolate muffins

Ingredients

Sorghum flour- 60 gram, moida-40-gram, oil-50-gram, sugar powder-100-gram, milk-50 gram, baking powder-1 gram, coffee powder- 5-gram, cocoa powder- 10-gram, vanilla essence-5 ml. vinegar and Choco chips as required,



Preparation Method

- In a bowl, add milk, oil, vanilla essence, mix it well, then transfer it to a blender.
 - Add sugar powder and cream to it, mix it well.
- Add jowar flour, baking powder, baking soda, cocoa powder, coffee powder, to the above mixture and mix it well.
- Now add vinegar to the above mixture, mix it well, and keep aside. place the wrapping paper into the muffin molds and add a spoonful of the above mixture into the above molds.

- Preheat the oven to 180 °C, 15 minutes.
- Bake for approximately 25 minutes in a preheated oven (which is at 180 °C)
- Upon baking, cool it for 10 minutes
- Now Jowar eggless chocolate muffins are ready to serve.

Recipe 12

Sorghum coconut chocolate balls

Ingredients

Sorghum cookies -70 gram, coconut powder-20 gram, cocoa powder-20 gram, condensed milk-60 gram, milk powder-20 gram, .



Preparation Method:

- Grind the cookies into powder in a mixi,
- add coconut powder & cocoa powder to the above cookie powder.
- Keep the pan on stove, add condensed milk & milk powder and mix it properly.

- Now add above cookie powder to above mixture
mix well till it attains thick consistency.
- Make a lemon size balls & toss them in coconut powder. Serve as millet sweet snacks.

Recipe-13

Sorghum gulabjamiun,

Ingredients



Preparation Method:

- Mash paneer & khova in a large bowl.
- Add sorghum flour & maida to this, along with baking soda & milk.
- Make soft dough like chapatti
- Keep it aside for 15 minutes.

- Make small balls with the above dough & deep fry till it attains a golden brown color on low flame.
- Make the cardamom flavored sugar syrup with thin consistency in another sauce pan.
- Add fried sorghum based khova balls, in sugar syrup and keep aside till soft.
- Serve plain or with ice cream as millet based delicious sweets

Recipe-14

Sorghum chocolate brownie

Ingredients



Preparation Method:

- Sieve the Sorghum flour along with cocoa powder, salt and baking powder.
- Heat dark chocolate and butter in a double boiler steam vessel, until the blend melts.

•In a large bowl add sugar, vanilla essence & later add sorghum & cocoa powder flour blend to the mixture and mix well.

•Add 2 eggs to this mixture & thoroughly mix the milk and keep aside.

•Meanwhile preheat the oven at 180 °C for 15 minutes

•Grease the mold with little butter and add millet cake batter.

Bake the above batter at 180 °C for 35 min in preheated oven.

•Cool it for 30 minutes and make slices.

•Serve as millet sweet snack with coffee

Recipe-15

Sorghum muffins

Ingredients



Preparation Method:

•Sieve sorghum flour and maida separately and mix it with dry ingredients (baking powder and salt).

•Beat eggs in a mixer/ by beater for 5 min, after that add sugar and beat this mixture till it attains fluffy nature.

•Add butter & yellow color to the mixture and mix well by adding vanilla essence.

•At the end, add both flours and mix for 10 min.

- Add Choc6 chips to the millet batter & pour in muffin moulds.
- In meanwhile pre-heat the oven at 180°(for 15 minutes.
- After preheating, bake the molds at 180°(for 25 minutes and cool it for 30 minutes.
- Serve it as millet baked goods.

Recipe -16

Sorghum panipuri

Ingredients



Preparation method

- Firstly, in a large bowl take Sorghum idli rawa, maida, salt & baking soda.
- Mix well by adding water, start to knead the dough till firm texture and rest it for 30 minutes.
- Knead it for 2 minutes, make small puris and deep fry it till golden color appears.

- Now enjoy the sorghum puris with sweet-tangy Pani and spicy aloo stuff. For Pani
- Firstly, in a bowl add tamarind, jaggery, pepper powder, red chilli powder, chaat masala, cumin powder, salt and beat it with spoon for 2 minutes. Mix it well with cold water. For potato stuff
- In a small bowl, add all the potato curry ingredients and mix well.

Recipe-17

Sorghum mysore pak

Ingredients



Preparation Method:

- Firstly, in a large kadai add ghee and oil.
 - Further get to a boil and simmer till you prepare Mysore Pak.
 - Take a small bowl and add sorghum flour & besan flour and make dry blend powder. Keep aside.
- Keep boiling and stirring till the sugar attains one string consistency.
- Furthermore, keep the flame on very low and add millet flour blend little by little.
 - Give a good stir making sure no lumps are formed.

Further add more flour blend and continue stirring. Add approximately in 3-4 batches to avoid lumps.

Now take a ladleful of hot ghee-oil and pour over the besan mixture, further continuously stir till oil is absorbed completely.

Keep repeating 4-5 times till the mixture starts to separate from pan.

Immediately, transfer the mixture to greased tray of enough depth. This helps to continue cooking and get golden brown colour in between.

After 5 minutes cut into pieces as desired, after 30 minutes separate the pieces.

Finally, serve millet Mysore Pak.

Recipe- 18

Sorghum burfi

Ingredients-



Preparation Method:

- Mix sorghum flour with besan blend in a bowl.
- Add 1 tsp of ghee and 1 tbsp milk to above bowl & sieve this flour to make lump free.
- Heat the ghee in a sauce pan & add above sorghum flour and fry thoroughly.
- Add condensed milk, sugar &
- cardamom powder to it & keep stirring.
- Cook the above sorghum mixture for 2-3 minutes.
- When done pour the mix on a greased plate & wait for 1 hr to set and cut into pieces before cool.
- Garnish with grated dry fruits on the top of sorghum burfi.

Recipe- 19

Sorghum namak para

Ingredients



Preparation Method:

- Take a large bowl and add all the dry ingredients, mix well.
- Now add required amount of water to make a soft and pliable dough (like chapatti dough).
- Pinch the dough and make a medium-sized ball from the dough on a dusted board.
roll into a disc neither too thin nor too thick.
- Roll in the form of chapatti and cut into diamond shapes.
- Deep fry in hot oil and fry till it attains golden yellow color.
- Serve like millet savory snacks with tea.

Recipe-20

Sorghum chocolate

Ingredients



Preparation Method:

- Melt dark and white chocolates together in double boiler.
- Meanwhile, take a flat bottomed pan, add sorghum flour and roast it for 5 min. Keep it aside.
- In a small bowl mix the roasted sorghum flour, dry fruit pieces, coconut powder and condensed milk for stuffing.
- Pour one layer of melted chocolate in moulds and freeze it for 5 minutes.
- After freezing put the sorghum sweet stuff in each mould and cover with another layer of melted chocolate and freeze it for 5 minutes.
- Remove the chocolates from moulds and wrap in colored wrappers.

Recipe-21

Sorghum samosa

Ingredients



Preparation Method:

- Take sorghum flour and maida in a large bowl. Mix well and add required amount of hot water to make dough.
- Make small chapati balls and spread the dough with roller stick and cut into halves.
- In a sauce pan, add oil, cumin and mustard seeds on medium flame
- To the above seasoning add turmeric, chopped onions, green chilies, curry leaves, boiled mashed potatoes, boiled peas and salt to taste.
- Cook for 10 minutes.
- After cooling, fill the above mixture in each half and fold in triangular shape and deep fry it.
- Serve it hot with tomato sauce and fried green chillies.

Recipe-22

Sorghum khichdi.

Ingredients



Preparation Method:

- Soak green moong dal and sorghum rawa in a single bowl for 15 min.
- In a bottomed pan, put oil and add mustard seeds, onion, green chillies, ginger garlic paste, tomatoes, curry leaves and turmeric powder, fry it for 4-5 minutes.
add sufficient amount of water and salt, cook at low flame till it is cooked properly.
- Serve hot with coconut chutney.

Recipe-23

Sorghum vermicelli kheer

Ingredients



Preparation Method:

- Take a shallow pan and roast the jowar vermicelli, cashew nuts and raisins separately in ghee until it becomes golden brown colour.
- Simultaneously, boil 500 ml milk in the pan over medium flame.
- When the milk comes to a boil, add roasted jowar vermicelli. Stir and cook until it turns soft or for around 1-2 minutes. Keep stirring continuously while cooking and make sure not to overcook it.
- Add sugar, ghee roasted raisins & cashew nuts and cook for 1 minute.
- Add cardamom powder also and turn off the flame.
- Serve hot as a traditional delicious sweet.

Recipe-24

Sorghum eggless cake.

Ingredients



Preparation Method:

- Preheat the oven to 180 °C before mixing of ingredients.
- Mix curd, milk & oil well and add powdered sugar, baking powder, baking soda and mix well in a large bowl.
- Add vanilla essence and sorghum flour to the above mixture.
- Grease the cake tray with oil and put the cake batter without air bubbles into it.
- Bake at 180 °C for 30 min after which remove the cake from the mould and serve.

Recipe-25

Sorghum pan cake

Ingredients-



Preparation Method:

- In a medium bowl, whisk milk, butter (or oil), and egg together. Add dry ingredients to milk mixture; whisk until just moistened.
- Drop by spoonful of batter onto a hot, griddle and cook until golden brown, turning once and a few have burst, 1 to 2 minutes.

Serve warm, with desired toppings like honey or chocolate syrup.

Recipe 26

Sorghum cabbage muthias

Ingredients-



Preparation Method:

- Combine all the ingredients in a bowl and knead to make a soft dough using enough water.
- Divide the dough into a 3 equal parts and shape each portion into a cylindrical roll.
- Place the rolls on a greased steaming dish and steam for 20 remove from the steamer and cool it for 15 minutes.
- Now, cut into thick slices and season it with oil and cumin seeds over a low flame till they are lightly browned.
- Serve hot and garnish with coriander,

Recipe- 27

Sorghum jeera sweet lassi

Ingredients-



Preparation Method:

Soak the sorghum grains for overnight and after that wash the grains properly.

Now take damp cloth and put washed sorghum • grains. Close the cloth loosely and keep at room temperature aside.

After 2 days take out from the cloth and sundry for 2 days.

After complete drying make it into a powder. Now roast the germinated sorghum flour for 5 minutes on medium flame till the raw flavour goes off.

Boil milk in a bottomed pan under medium flame.

Add 5 g of germinated sorghum powder to it and heat up for 10 min.

- Take the above mixture from flame and keep aside.

Now take damp cloth and put washed sorghum • grains. Close the cloth loosely and keep at room temperature aside.

After 2 days take out from the cloth and sundry for 2 days.

After complete drying make it into a powder. Now roast the germinated sorghum flour for 5 minutes on medium flame till the raw flavour goes off.

Boil milk in a bottomed pan under medium flame.

Add 5 g of germinated sorghum powder to it and heat up for 10 min.

Add curd culture to it and allow it for overnight to make it into curd.

Keep the curd in refrigerated conditions.

To make Sorghum Jeera lassi add cumin powder, salt and stir continuously for 5-10 min to avoid the lumps, and then filter whole material and chill.

To make Sorghum Sweet lassi add sugar and stir continuously for 5-10 min to avoid the lumps and chill.

Best when served chilled.

Recipe- 28

Sorghum gorimettulu

Ingredients-



Preparation Method:

- Prepare dough with sorghum flour, maida, ghee and salt. Add small quantity of hot oil while dough making and make it into a soft dough.
- Now add sorghum suji to the dough knead well keep a side for 30 minutes.

- Make a lemon size balls from the dough, make shapes manually and press in between with fingers.
- Fry the prepared Sorghum Gorimetteelu in hot oil until it becomes brown colour.
- Excess oil is to be drained using tissue paper before serving.

Recipe- 29

Sorghum vermicelli upma

Ingredients-



Preparation Method:

- Firstly, boil the 500 ml of water till it gives bubbles, now add 50 g of jowar vermicelli into it with two drops of oil and cook it for 4-5 minutes.
- Drain the Jowar vermicelli and keep aside.

- Pour oil in a pan, when oil turns hot add mustard, cumin, channa dhal, urad dhal and peanuts.
- Next add chopped onions, chillies and curry leaves and fry about 2-3 minutes.
- Now add the cooked Jowar vermicelli into the above pan and cook for 2-3 minutes.
- Serve hot as healthy and tasty breakfast.

Recipe- 30

Sorghum halwa

Ingredients-



Preparation Method:

- In a pan, roast the sorghum flour in ghee until its aroma and color changes.
- Add milk to the mixture and cook for 5-10 minutes on low flame.
- Melt the jaggery on low flame by adding 1 tbsp of water to grated jaggery in sauce pan.

- Now add the melted jaggery, a pinch of ghee to the flour mixture and mix well without formation of lumps till it attains thick consistency.
- Pour the prepared batter in a mould and allow it to set.
- Garnish it with grated dry fruits and serve.

Recipe- 31

Sorghum sarbat-

Ingredients-



Preparation Method:

- Soak the barley grains for at least 6-8 hours and wash it properly.
- Take a bottomed vessel, add sorghum flour and barley to cold water in required amounts and boil in simmer for 20 minutes.
- Remove the pan from the heat and add the pepper corns, lemon juice and sugar.
- Stir, cover, and cool to room temperature and chill well.
- Before serving, blend in the lemon or pour over ice and garnish with a citrus twist.

Recipe- 32

Sorghum steamed wada

Ingredients-



Preparation Method:

- Soak the sorghum grains for 30 minutes and steam it for 20 minutes in a steamer.
- The steamed sorghum grain is taken and made into a coarse paste in wet grinder or grinder and transfer into a large bowl.
- Now add the bengal gram flour, salt, pepper, chilli powder and cumin seeds are added to the above mixture.
- Small balls of the mixture are made and made into wada.
- The wada is fried in hot oil medium flame.
- Excess oil is removed using tissue paper.
- Serve it with tomato or peanut chutney.

Recipe- 33

Sorghum bhakarwadi

Ingredients-



Preparation Method:

- Take a pan and roast the masala spice ingredients until it gives nice aroma.
- Keep aside for cooling, add other remaining ingredients and make it into a powder.
- Now prepare sorghum dough by mixing all the flours with water & oil. Knead till dough consistency and make small balls.
- Roll the small balls and make round shapes and put the Bhakarwadi masala onto the round shape.
- Roll inward and cut the roll into small pieces.
- Fry the small rolls in oil until golden colour appears.
- This can be consumed as an evening snack.

Recipe- 34

Sorghum bundi laddu.

Ingredients-



Preparation Method:

- Take all the dry ingredients (sorghum flour & Bengal gram flour) for the Boondhi batter in a mixing bowl.
- Add water to make a smooth batter in the above bowl.
- Put the batter onto a Boondhi frame and fry the till Boondhi golden colour.
- Take sugar and water in a pan, and boil till a single thread consistency and add the cardamom powder and mix well.
- Now take Boondhi in a bowl, add in the hot sugar syrup.
- Add ghee also. Ghee helps in binding the ladoo.
- Mix well and shape the Boondhi mixture into ladoo.

NOW RECIPEES FROM PEARL MILLETS .



PEARL MILLET

Scientific name: *Pennisetum glaucum* (L.) R. Br.

Hindi name: Bajra; Telugu name: Sajjalu; Kannada name: Sajjai

Pearl millet plant was probably domesticated as a food crop some 4000 to 5000 years ago along the southern margins of the central highlands of the Sahara. It has since become widely distributed across the semiarid tropics of Africa and Asia.

Pearl millet has traditionally been an important grain, forage, and stover crop primarily in the arid and subtropical regions of many developing countries. Pearl millet is well adapted to growing areas characterized by drought, low soil fertility, and high temperature. Because of its tolerance to difficult growing conditions, it can be grown in areas where other cereal crops, such as maize or wheat, would not survive.

This millet possess phytochemicals that lower cholesterol. It also contains foliate, magnesium, copper, zinc and vitamins E and B-complex. It has high energy content

compared to other millets. It is also rich in calcium and unsaturated fats which are good for health.

RECIPE- 35

Pearl millet caramel slice

Ingredients-



Preparation Method:

- Combine all the cake slice ingredients in a saucepan over medium heat.
- Cook and mix the above liquid mixture until it gives golden color.
- Pour the above pearl millet mixture in bread mold.
- Preheat the oven at 180°C for 15 minutes.
- Bake at 180°C for 20 minutes.
- Cool completely at room temperature.
- Melt the dark chocolate by using the double steaming method and add filling ingredients to it.
- Pour the above mixture over the caramel slices

- Refrigerate it for 3 hours.
- Cut into cubes and ready to serve as yummy millet snacks.

Recipe- 36

Pearl millet cheese cookies.

Ingredients-



Preparation Method:

- In a blender/mixer, add buttercream, cheese and blend it.
- Slowly add salt, red chilli powder, and baking powder, mix well.
- Add flour and blend the mixture till the dough forms a smooth texture.
- Chill the dough for at least 15 minutes in a refrigerator.
- Place the dough on a lined sheet and cut with cookie cutters.
- Preheat the oven for 180°(for 15 minutes and bake them at 180°(for 15 minutes.
- Allow them to cool at room temperature.
- Pearl Millet cheese cookies are ready to eat/serve with hot tea.

Recipe- 37

Pearl millet milk chocolate

Ingredients



Preparation Method:

Melt the dark & white chocolates together in a saucepan over medium to high heat by using a double steam method.

- Take the above chocolate mixture in another bowl.
- Add almonds, cashew nuts, raisins, ghee to the flour, and stir them gently.
- Mix the above mixture until a smooth and silky consistency is achieved.
- Add Nescafe powder and stir gently.
- Pour the chocolate mixture into chocolate molds. (If you don't have any molds, you can simply use an ice tray)
- Refrigerate the chocolate in a deep freezer for 15 minutes until the chocolate completely sets.
- Serve as healthy millet confectionary

Recipe- 38

Pearl millet jelabi

Ingredients-



Preparation Method:

- Firstly add Sugar and water (1:1 ratio) to a vessel.
- Boil on a medium flame, until it gives thin string consistency and then off the flame.
- Cool it and keep aside.
- In a separate large bowl, add maida, Pearl Millet flour, baking powder, and food color.
- Mix it well until it becomes uniform.
- Next, add curd and make a thick lump free batter.
- The batter has to be thick, but it should have flowing consistency.
- Heat oil on medium heat to fry Pearl Millet jilebi.
- Squeeze-in the batter gently in circular motions starting from the center moving outside, using cone-shaped cloth, which is having a hole.
- When the Pearl Milletjilebi is visually crispy, remove it with a skewer.
- Add the above Pearl Millet jilebi to the warm sugar syrup directly.
- Allow it to rest for 2 minutes and put it on a serving plate.
- Serve Pearl Milletjilebi as delicious sweets.

Pearl millet sev

Ingredients



Preparation Method:

- Mix Pearl Millet flour, roasted Bengal gram flour, salt, hing and turmeric powder in a bowl.
- Add water slowly in the above bowl to form a smooth dough.
- Take a pan, pour oil, and heat it over medium flame for deep frying.
- Fill up the sev maker with a portion of the pearl millet dough.
- Once the oil is sufficiently hot, carefully put the Pearl Millet sev in the pan.
- Press the sev maker by keeping it directly to the oil.
- Turn it gently with a slotted spoon for even deep frying. When the oil stops sizzling, take the Pearl Millet sev out of the oil.
- Deep fry them till they turn slightly golden brown and transfer them to an absorbent paper to remove excess oil.
- Serve as healthy millet snacks for children.

Recipe- 40

Pearl millets veggie box puff.

Ingredients-



Preparation Method:

Take pearl millet flour, finger millet semolina, wheat flour, salt, and oil into a mixing bowl. Crumble them well enough.

Knead it to form the smooth and soft dough by adding adequate water to it.

Cover with a moist cloth and rest it for 15 minutes. In the meantime, add maida, salt, and water in

another bowl and make it slurry.

Sprinkle some flour on the dough and roll it evenl to get a thick base.

Now cut into rectangular shaped slices. Place the curry stuff into the above slices.

Join the edges, slightly press the sides of the slice, and give a coating of maida slurry. Then pearl Millet veggie box puff is ready to be fried.

Heat a wide heavy bottomed vessel with enough oil, and once the oil is sufficiently heated, put Pearl Millet veggie box puff to it and fry until it becomes golden brown.

Serve with tomato or chilli sauce as a tasty snack.

Curry preparation:

Heat 1 tbsp of oil in a pan, add onion pieces & cumin seeds to it.

Take grated boiled carrot, grated boiled Potato, chat masala, coriander powder, and coriander leaves. Add it to the above pan and saute them.

Add garam masala and prepare the curry. Keep it aside for a while.

Recipe- 41

Pearl millet rusk-

Ingredients-



Preparation Method:

- Add butter & castor sugar in a planetary mixer or beat with hand beater, add eggs one by one to this mixture until it becomes fluffiness.
- Add pearl millet flour, baking powder, vanilla essence, yellow color & mix thoroughly.
- Simultaneously pre heat the oven at 180 °C for 15 min.

Pour the above batter on a greased cake pan & bake at 180 °C for 20 min.

- After cooling cut into square pieces (like bread slices) and bake it in an oven at 180 °C, for 20 min (on side) one after another for 20 min (back side), till it gets crisp in nature.
- Serve as evening millet bakery snack.

Recipe- 42

Pearl millet besan laddu

Ingredients-



Preparation Method:

- Roast pearl millet flour, besan and wheat rawa separately with ghee and mix thoroughly in a pan
- Add little ghee separately in a pan and fry dry fruits.
- Mix the ghee roasted flours with dry fruits in a large bowl.
- Add sugar and cardamom powder to the above mix
- Make small Laddus with ghee.
- Pearl millet besan laddus are ready to serve as delicious sweet.

Recipe- 43

Pearl millet pokodi



Preparation Method:

In a mixing bowl add all the ingredients like chopped onions, pearl millet flour, besan, rice flour, salt, chilli powder, dhaniya seeds and mix well.

- Mix all of them and squeeze the onions a couple of times to release its juice and set this aside for 5-10 minutes.
- Add water to the above mixture if needed.
- Heat oil in the pan until, it attains medium hot.
- Take small portions of pearl millet onion batter and gently drop them in a hot oil.
- Fry till these pakodis turns golden brown colour.
- Serve it as spicy millet snack.

Recipe- 44

Pearl millet pesarattu

Ingredients-



Preparation Method:

- Soak pearl millet and whole green gram together for 5-6 hr and grind them into batter consistency and ferment it for 3-4 hr.
- Grind red chillies, green chillies, ginger, needed salt and add to the fermented pearl millet batter along with finely chopped onions and coriander leaves.
- Heat a tawa on medium flame and put a ladleful of above batter and spread it in round shape.
- Fry and flip the pesarattu to the other side for cooking on both sides.
- Once roasted remove from tawa.
- Serve hot with peanut-coconut chutney and sambar

Recipe- 45

Pearl millet upma

Ingredients-



Preparation Method:

- In a pan roast the pearl millet rawa till it turns brown color.
- In a sauce pan add oil and heat it for 5 minutes.
- Now add mustard seeds, channadhal, chopped onions, green chillies, black gram dhal, and curry leaves and fry for 5 minutes
- After that add finely chopped carrots, beans & potatoes, and saute it for 2 to 3 minutes.
- Add 4 cups of water along with salt, increase the flame and let the water comes to a rolling boil.
- Now add roasted rawa and cook well till it becomes soft.
- Serve hot with any pickle.

Recipe- 46

Pearl millet roti-

Ingredients-



Preparation method-

- Add hot water to the sieved pearl millet flour. Knead into smooth soft dough.
- Make it into round ball and spread it like round shape on polythene sheet by rolling stick or by hand pressing with palm.
- Bake the roti properly on both the sides of a pre heated tawa.
- Serve hot with any curry or dal.

Recipe- 47

Pearl millet onion muthias

Ingredients-



preparation Method:

- Combine all ingredients and mix well with 1 tbsp of oil and knead into a semi-soft dough using enough water.
- Apply a little oil and shape into cylindrical and cut into slices.
- Heat the remaining oil in a non-stick pan and add the mustard seeds.
- Shallow fry the pieces in oil and season with cumin seeds.
- Add pearl millet Muthias and with $\frac{1}{2}$ cup water and cook for 5-8 minutes on medium flame.
- If required add some amount of water and cook for 5 minutes.
- Now garnish it with coriander and serve.

Recipe- 48

Pearl millet halwa-

Ingredients-



preparation Method:

- In a pan, roast pearl millet flour in ghee until the aroma and color changes.
- Add milk to the mixture and cook for 5-10 minutes on low flame.
- Melt the jaggery on low flame by adding 1 tbsp of water to grated jaggery in sauce pan.
- Now add the melted jaggery, pinch of ghee and mix well without lumps until thick consistency.
- Pour the prepared batter in a mould and allow to set.
- Garnish it with grated dry fruits and serve.

Recipe- 49

Pearl millet khichidi

Ingredients-



preparation Method:

- Take a bowl, soak pearl millet grains and moong dal for overnight.
- In a pressure cooker, add 3 tsp of oil, mustard seeds, cumin, green chillies, ginger garlic paste, veggies and saute it for about 5-10 minutes. Add all powders and saute it for 2 minutes.
- Now add soaked, washed pearl millet grain, moong dal, 5 cups water and cook for 4-5 whistles.
- Further, season with coriander leaves and lemon juice.
- Serve hot as millet healthy dish.

Now recipes from finger millet -ragi



FINGER MILLET

Scientific name: *Eleusine coracana (L.) Gaertn*

Hindi name: Mandua; Telugu name: Ragulu; Kannada name: Ragi

It is an annual plant extensively grown as cereal in the dry areas of India, especially in the southern part. It contains high amounts of calcium, proteins with well-balanced essential amino acids along with vitamin A, vitamin B and phosphorous. Its high fibre content prevents constipation, high blood pressure and intestinal cancer.

Finger millet is commonly used in South Indian Kitchens. It is rich in calcium, about ten times that of rice or wheat. It is an important ingredient in the food of babies, as it contains plenty of calcium and iron. Protein content in finger millet is high making it an

important factor in preventing malnutrition. Also making it an ideal food for diabetics as it has demonstrated ability of controlling blood glucose levels and hyperglycemia.

Recipe- 50

Finger millet badusha

Ingredients-



preparation Method:

- Firstly mix finger millet flour, maida, curd, salt, baking soda, ghee vigorously, and knead till it becomes tight similar to chapati dough.
- Let it rest for 30 minutes.
- After that divide, the dough into equal lemon sized balls, flatten it a little and make an impression with your thumb in the middle.
- Take a pan, add water and Sugar (1:1) and bring it to boil till it becomes string and thin consistency.
- Separately heat oil, add 4-5 Finger Millet badusha and fry them with a low until it becomes golden brown.
- Flip them gently and cook on both sides.
- After deep oil frying, drop them in the sugar syrup and let it rest for 8-10 minutes.
- Then remove it from the sugar syrup and place it on a plate.
- Let the sugar syrup dry.

- If needed, garnish with grated coconut and cashew nuts on top while serving.

Recipe- 51

Finger millet dosa

Ingredients-



preparation Method:

- Mix the Finger Millet flour, rice flour, wheat upma rawa, curd, salt, and cumin seeds in a mixing bowl.
- Make a thin batter consistency by adding sufficient amounts of water.
- Heat the non-stick pan and grease it with the little amount of oil.
- When the pan is hot, pour a ladleful of the batter and spread using a circular motion to make a thin dosa.
- Flip and cook on both sides.
- Pour a little oil along the edges while cooking.
- When crispy, take from the pan.

- Serve hot with coconut chutney/peanut chutney/tomato sauce.

Recipe- 52

Finger millet flakes milk shake

Ingredients



preparation Method:

- Roast the finger millet flakes, put them in a blender jar, and make it into powder.
- Chop the dates into small pieces and make it into a paste.
- Add milk (boiled and cooled) to the above mix and blend into a smooth mixture.
- Filter the above millet liquid mixture.
- Freeze it for 1 hour until it becomes a thick consistency
- Garnish it with dry fruits.
- Serve chill as a healthy millet beverage.

Recipe- 53

Finger millet peanut chikki

Ingredients-



preparation Method:

- Roast and coarsely crush the peanuts with a mixer/grinder.
- Heat jaggery with 1 tbsp water until it gives thick consistency.
- Boil the syrup until it shows hard crack consistency.
(Test its consistency by putting a drop in cold water- it should crack after taking it out).
- Add finger millet flour, peanuts, ghee to the syrup and mix it thoroughly.
- Grease a tray with a little amount of ghee and spread the mixture.
- Roll it flat using a rolling pin (belan).
- After cooling, cut into square shapes.
- Serve as a healthy millet-based snack.

Vermicelli Faluda - 54

finger millet



Vermicelli Faluda

reparation Method:

- Boil Finger Millet vermicelli in water for 2-3 minutes and keep aside.
- Clean chia seeds with water and drain them using a strainer.
- Now soak the cleaned chia seeds in water for 10 minutes, followed by draining excess water using a strainer.
- Boil the milk and let it get cooled for a few minutes in the freezer.
- Add sugar to it and stir well until it gets dissolved.
- Take a large serving glass, add red rose syrup first.
- Add soaked chia seeds and cooked Finger Millet vermicelli.
- Next, pour the chilled milk into the mixture of soaked chia seeds and cooked Finger Millet vermicelli, mix thoroughly with the spoon.
- Garnish it with grated almonds.
- Delicious millet dessert is ready to serve

Fingere millets 55

Burbon biscuits



preparation Method:

- Beat the butter in a blender for 5 minutes.
- Add sugar powder and blend till it becomes creamy and fluffy.
- Add ragi flour, baking powder, and cocoa powder and mix it well.
- Add vanilla essence and milk to it and beat it well to get a soft dough.

- Place the dough in butter paper and spread with a roller pin.
- Now cut the cookies using a cutter in a required rectangular shape and perforate it.
- Sprinkle Sugar over the ragi bourbon biscuits.
- Preheat the oven at 180°(for 15 minutes
- Bake ragi bourbon biscuits at 180°(for 20 minutes. Upon baking, keep it aside to cool.
- In a blender, add butter, sugar powder, cocoa powder, and vanilla essence and beat for 15 minutes. Take this cream in another bowl.
- After cooling, fill the cookies with the above cream in the center of biscuits and press them with other biscuits.
- Now millet bourbon biscuits are ready to eat

Finger millets - 56

Potato patties



Preparation method.

- Shred the potatoes and keep them in cold water for 5 minutes.
- Now remove water from the potatoes by squeezing it.
- Mix all the ingredients (ragi flour, egg, red chili powder, pepper powder, turmeric powder, garam masala chopped curry leaves) in a bowl.
- Add shredded potatoes to the above bowl and mix them well
- Take the above batter and place it on a hot pan. Repeat it depending on the required no.of patties.
- Shallow fry it for 10-50 min on medium flame. Make sure to have even frying on both sides.

- Serve as Ragi potato patties with tomato sauce

Finger millet (balusai) -57



- Firstly add ghee in a bowl and whisk it with a spoon or a small whisk, beat the ghee till it becomes smooth, light and fluffy.
- Mix and whip the curd with the creamed ghee.
- Now add both flours, baking powder & baking soda to the above ghee blend.
- Add required amount of water, mix and combine everything to form a soft dough.
- Mix them properly & keep aside for 30 mins.
- Simultaneously, make sugar syrup in one string consistency form (2:1-Sugar: water).
- Do ragi based balls with the pressing dough between two hands and give a gentle punch at the centre.
- Deep fry the above millet balls on low flame until they become golden brown and crispy.
- Soak the fried Balushahi in sugar syrup for 15 minutes.
- Serve it as delicious and yummy ragi sweet

Finger millet (upma pakadi) - 58



Preparation method

Heat 1 table spoon oil of in a pan, add mustard seeds, cumin, hing, onion pieces, green chilies, curry leaves & roast it for 3-4 min.

- Take 120 ml water in a bowl, add salt and boil it for 5 minutes, while boiling add ragi rawa (roasted) into it & cook till becomes thick like upma.
- After it cools keep aside and add besan, mix it well.
- Take this mixture and gently put in hot oil like normal Pakodi.
- Fry until millet upma Pakodi becomes golden brown color.
- Serve it with tomato sauce as evening snack.

Finger Millete (bounty bars) - 59



Preparation method

- In a pan roast ragi flour & coconut powder separately, and keep a side.
- Add condensed milk to the above mixture and mix well.
- Make the mixture into oval shape balls.
- Melt chocolate by double steamer & dip these balls in chocolate.
- Keep in fridge for 20 min to dry the balls.
- Now Finger millet Bounty bars are ready to eat.

Finger millets (vermicelli curd rice)- 60



- Firstly, boil the 250 ml of water till it gives bubbles, now add 25 g of ragi vermicelli into it with two drops of oil and cook it for 3-4 minutes.
- Drain the Ragi vermicelli and keep it aside to cool for 5 minutes.
- Take a mixing bowl, add curd and salt and beat it with small spoon.
- Now add the cooked finger millet vermicelli to above bowl.



- Take a pan and put 1 tsp of oil, mustard seeds, cumin, curry leaves & red chillis, fry it for 3-4 minutes. Off the flame.
- Pour the above mixture on the curd vermicelli mixture and decorate with pomegranates seeds.

Serve as healthy and yummy lunch rice

Finger millets (junnu) -61



Preparation method

Beat eggs in a mixi jar, add grated jaggery, cardamom powder, pepper powder, Finger millet flour and mix it thoroughly.

- Add milk to this mixture and mix properly.
- Pour in a pan and steam boil it without a whistle for 20 minutes on medium flame. Insert a spoon to know if it is cooked.

Finger millets cake -62



- Pre heat oven to 180 °(for 15 minutes and sieve all dry ingredients for uniform mixing.
- Beat sugar powder and egg whites for 10 minutes until it gives nice foam and fluffiness.
- Now add cake gel and both essences and mix well.
- Add milk and oil to the above mixture and beat for 2 minutes.

After that add finger millet flour, cocoa powder, salt, baking soda & baking powder to the egg mixture and make it into fine batter.

- Put the batter in baking mold and place in the oven at 180 °C for 35 min.
- Take the cake out and wait for 15 min until it gets cool.
- Cut into pieces and serve a delicious and spongy finger millet cake.

Cool and cut into pieces.

Garnish it with pepper powder and serve as mouth-watering finger millet dish.

Finger millets

Chocolates pudding -63



Preparation method

- In a sauce pan, boil water with a pinch of salt, add the finger millet rawa to the boiling water and next add milk to the mixture.
- Cook it for 2 min.
- Then add the finger millet flour to it and do not stop stirring for 2 min, to free from lumps.
- Now add chopped dark chocolate to the above mixture and stir well.
- Allow the mixture to cool completely, stirring occasionally to avoid a skin forming on the pudding.
- Serve hot or cold with chopped nuts.

Finger millets- 64

Vermicelli kheer



- Take a shallow pan and roast the ragi vermicelli, cashew nuts and raisins separately in ghee until it becomes golden brown colour.
- Simultaneously, boil 500 ml milk in the pan over medium flame.
- When the milk comes to a boil, add roasted ragi vermicelli. Stir and cook until it turns soft or for around 1-2 minutes. Keep stirring continuously while cooking and make sure not to overcook it.
- Add sugar, ghee roasted raisins &

cashew nuts and cook for 1 minute.

- Add cardamom powder also and turn off the flame.
- Serve hot as a traditional delicious sweet.

Finger millets (murukku) -65



- First take ragi flour, rice flour, besan, sesame seeds, ajowan, turmeric powder, chilli powder and salt in a mixing bowl. Mix well.
- Add water little by little to make a smooth dough.
- Fill the finger millet dough in the hand operated muruku machine.
- Prepare 3-4 rounds offinger millet muruku on a cloth.
- Deep fry in a hot oil, flip and cook in medium flame until bubbles completely stops.
- Put them over paper towel to remove oil and cool it.
- Serve as finger millet muruku as evening snack.

Finger millets (vermicelli upma) -66



Preparation methods

- Firstly, boil the 500 ml of water till it gives bubbles, now add 50 g of ragi vermicelli into it with two drops of oil and cook it for 3-4 minutes.
- Drain the Ragi vermicelli and keep aside.
- Pour oil in a pan, when oil turns hot add mustard, cumin, channa dhal, urad dhal and peanuts.
- Next add chopped onions, chillies and curry leaves and fry about 2-3 minutes.
- Now add cooked ragi vermicelli and fry it for 2-3 minutes.
- Serve hot as healthy breakfast.

Finger millets (soft mudde) -67



Preparation method

- Mix about 2 tsp of finger millet flour with water.
- In an aluminium or thick-bottomed utensil, boil water and add salt.
- Add finger millet flour and water mixture and stir continuously.
- Add the remaining finger millet flour and simmer for 3-4 minutes or until it thickens.

Take the above dough in hand and start twirling it around till it forms a nice smooth ball.

Soft finger millet mudde is ready.

Serve hot with sambar or stuffed brinjal curry.

Recipes of foxtail millets



Scientific name: *Setaria Italica* (L.) P. Beauvais

Hindi name: *Kangni*; Telugu name: *Korralu*; Kannada name: *Navone*

Foxtail millet is one of the oldest cultivated millets. Three to four decades ago, foxtail millet was consumed as the staple food. It has double quantity of protein content compared to rice. It controls blood sugar and cholesterol. It increases disease resistant capacity when consumed and is considered as ideal food for people suffering from diabetes and gastric problem.

Foxtail millet provides a host of nutrients, has a sweet nutty flavour and is considered to be one of the most digestible and non-allergic grains available. It contains fibre, protein, calcium and vitamins. It is a nutritive food for children and pregnant women. It is rich in dietary fibre and minerals such as copper and iron that keep one's body strong and immune.

Foxtail millets (chocolate ice-cream) -68



Preparation method

- Soak the foxtail millet rice in excess amount of water for overnight.
- Wash the grains properly and grind the millets by adding water in a 1:1 ratio (Foxtail millet: water).
- Extract the milk from the foxtail millet and filter it.
- Put the whipped cream in a blender and mix it till it becomes silky and fluffy.
- Add cocoa powder and condensed milk to the above mix and blend it again in the mixer.
- Add foxtail milk to the above mixture and blend till it becomes fluffy.
- Transfer it to a bowl and keep in the freezer for 8 hours.

Now foxtail chocolate ice cream is ready to serve as a delicious frozen dessert

Foxtail millets (double ka mithha) -69



Preparation method

- Firstly cut the foxtail bread into slices.
- Heat the pan and drizzle it with ghee in a pan. Now place the sliced foxtail millet bread into the pan.
- When the foxtail bread base is golden, flip each one and toast the foxtail bread slices in batches.
- Toast till thesecond side is golden and flip again.

Remove the bread slices on a plate and keep aside.

In the same pan, fry the almonds and cashew nuts with ghee and chop them into small shreds.

- Take a separate pan, add water and sugar (1:1) and bring it to boil till it becomes string and thin consistency.
- Place the ghee toasted foxtail millet bread within the sugar syrup for 15 minutes. Heat another pan and pour the milk, let it boil on a reduced flame.

Now add the above-boiled milk to the sugar syrup dipped ghee toasted foxtail millet bread and decorate it with ghee roasted dry fruits.

A healthy delicious Foxtail Millet Double ka Meetha is ready to serve.

Foxtail millets (masala peanuts) -70



Preparation method

- Take a pan and roast the peanuts until it releases the aroma and keep it aside in a bowl.
- Take all the ingredients like foxtail millet flour, roasted Bengal gram flour, rice flour, corn flour, red chili powder, salt, baking soda & hing in a bowl and mix well by adding required quantity of water.
- Now coat the roasted peanuts with the above mix and keep aside.
- Heat a full heavy bottomed vessel with enough oil for deep frying, and once the oil is heated enough, place the coated peanuts into the hot oil. Fry them till light brown and remove.
- Sprinkle chat masala over the deep-fried peanuts after cooling.
- Foxtail millet masala peanuts are ready to serve as a healthy snack.

Foxtail millets (halwa) -71



Preparation method

Boil the dehulled foxtail millet rice in excess water in a deep bottomed utensil and strain out 150 ml of gruel in a separate bowl with the help of a strainer.

- Dissolve the Sugar in 100 ml of water and add lemon juice (as required).

Boil it by stirring for 10 minutes and keep aside.

Take a pan, add ghee, and cornflour slurry (mix cornflour and 100 ml of water).

- Add foxtail millet gruel to it.

• Cook it and simultaneously stir the above mixture continuously till it sticks to the base of the pan and then turn off the flame

Add sugar syrup slowly to the above mixture and mix well continuously.

Take a pinch of color and add the required amount of water and mix well.

- Add above the color liquid to the mixture and cook for 10 minutes, until it gives thick consistency.

Now take the cake pan and grease it with ghee. Pour the foxtail millet liquid mixture into a greased pan, decorated with watermelon seeds.

Allow it to cool. Cut into square pieces and serve as delightful foxtail millet Bombay Karachi halwa.



Filling Preparation:

Heat a pan with oil, add the mixture of cumin seeds and fennel seeds, and fry it for 2 minutes.

Add onions, green chilies, turmeric powder, red chilli powder, salt, garam masala, dhaniya powder, roasted Bengal gram flour, boiled, mashed Potato to the above mixture.

Cook the fillings for 6 minutes.

Upon cooling offillings, make a lemon sized ball of it and set aside.

Preparation Method:

In a mixing bowl, add foxtail flour, refined wheat flour, Ajwain seeds, and a required amount of oil.

Add water slowly while mixing and do kneading to make a firm yet pliable dough.

Cover the dough and make it rest aside.

Make foxtail millet kachori by kneading and rolling the dough into a circle.

Add filling in the center, seal it by pulling the edges together to make a ball.

Bring the dough's edges together and join them at the center, the excess dough can be pinched off and removed.

Flatten the top and then gently roll the foxtail millet kachori with a rolling pin to get a medium thickness kachori.

Heat oil for frying and keep the flame to a low, when the Oil is just hot enough, put the foxtail millet kachori in the oil.

When the foxtail millet kachori starts puffing up, gently nudge each kachori with a ladle so that they puff up well.

When the base becomes lightly golden, then gently turn them over. The frying takes about 7 to 9 minutes.

Continue to fry on a low-medium flame till the foxtail millet kachori becomes golden, while frying you can turn them often to get an even color and regulate the temperature from low-medium as required.

Fry the foxtail millet kachori till they become golden and nicely crisp from outside.

Place foxtail millet kachori on paper towels so that excess oil is absorbed.

Serve as flaky and tasty foxtail millet kachori as a snack with tomato or chilli sauce

Foxtail millet (rosogolla) -73



Preparation method

- Boil foxtail millet grains in a vessel containing an excess amount of water and extract 100 ml of gruel from it by using a strainer.
- In a pan, add foxtail milk to the regular milk, bring it to boil, and add lemon juice.

- Remove the pan from heat when the milk gets coagulated.
- Strain milk solids in a muslin cloth and squeeze excess water, tie the muslin cloth and rest it for 1 hour.
- Knead the milk solids (or paneer) until it forms a smooth dough.
- Roll dough into a ball, and cover the balls with a muslin cloth.
- For the sugar syrup, boil the sugar, water (1:1) in a heavy-bottomed saucepan, and stir continuously till it becomes sticky with one string consistency. Once done, take it off the heat and keep aside.
- Boil the paneer balls in sugar syrup and allow to cool, till it swells with syrup
- Delicious foxtail millet rasagulla is ready to serve.

Foxtail millet(murukku) -74



Preparation method

- Mix all ingredients in a bowl and add hot water in a slow control manner to form a smooth dough.
- Heat a wide heavy bottomed vessel with enough oil for deep frying.
- Once the oil is heated, fill up the muruku maker with a portion of the dough.
- Press the muruku maker by keeping it directly on top of the oil.

- Turn it gently with a slotted spoon for even deep frying.
- When the oil stops sizzling, take the foxtail muruku out of the oil.
- Put the foxtail muruku on the tissue paper to absorb an extra oil.
- Serve as a healthy foxtail muruku snack.

Foxtail millet (sweet Pongal) -75



Preparation method

- Take a small saucepan, add channa dhal and water to it. Cook it for 10 minutes with a closed lid; this results in half-cooked dal.
- Add washed foxtail millet rice to it and cook till it turns very soft. Add water for cooking if necessary.
- In another bowl, add Jaggery with little amount of water and cook on a medium flame for 5 minutes.
- Now add jaggery syrup, cardamom powder, milk to the cooked rice to get foxtail millet sweet Pongal.
- Roast the dry fruits with ghee in a separate pan and add to foxtail millet sweet Pongal.
- Serve hot as delicious foxtail millet sweet.

Foxtail millets (flaxseed laddu) -76



- Roast each ingredient (foxtail flour, dry fruits) separately in ghee.
- Take another pan and dry roast the flax seeds.
- Add foxtail millet flour, flax seeds, dry fruits, cardamom pods, and Jaggery and mix well in a blender.
- Mix all the ingredients thoroughly and make lemon size balls with ghee.
- Foxtail Millet flax seeds laddu is ready to serve.



Preparation method

Firstly, in a large mixing bowl take dry roasted coconut powder, roasted ground nuts powder, roasted bengal gram, sugar, sesame seeds, chopped dry fruits, cardamom powder and mix well.

- Finally, the stuffing is ready to prepare Kajjikayalu and keep aside.
- In another large mixing bowl take foxtail flour, refined wheat flour and salt to taste.
- Further pour required amount of water crumble the dough well between your hands.
- Knead the above mixture into dough.
- Now pinch a small ball sized dough and roll it to a ball.
- Roll it to a slightly thick pooris and cut to a round shape.
- Now place a 1 tsp of the prepared coconut-dry fruits stuffing at center of the Puri.
- Stick the Kajjikayalu edges together and press slightly.
- Deep fry the above stuffed pooris in hot oil till they turn golden brown.
- Finally, keep on tissues and serve it as millet sweet based snack.

Foxtail millet (bisi bele bath) - 78



- Cook the foxtail millet rice, red gram dal, turmeric powder, salt in pressure cooker, add 4 cups of water, and cook until 5-6 whistles.
- Take a sauce pan, add oil. After heating add mustard seeds, cumin seeds, red chilli, curry leaves, and roast it for 2-3 minutes.
- Further add sambar powder, tamarind extract and chopped vegetables and saute it for 15-20 min.
- Now add cooked foxtail millet rice and red gram dhal to the above mixture and cook together till the mixture becomes soft.

Transfer the foxtail millet bisi bele bath to a serving bowl.

- Sprinkle the chopped coriander and serve hot.

Foxtail millet (cutlet) -79



- All the chopped vegetables and foxtail millet grain (1:3 water ratio) are cooked for 25-30 minute separately and kept aside.
- In a pan add one table spoon of oil, ginger garlic paste, sliced green chilies and fry them until light brown colour appears.
- Add the cooked millet, chat masala, pepper and cooked vegetables and mix them well.
- Make them into cutlet shapes, coat the cutlets with foxtail bread crumbs.
- Shallow or deep fry in a pan them until light brown colour appears.
- Serve with tomato sauce or chutney.

Foxtail millet (kheer) -80



Preparation method

- Soak the foxtail millet rice in a vessel for 1h.
- Take a bottomed vessel, put the dehulled foxtail millet and add 1:3 ratio of water.
- Cook the foxtail millet rice for 20-25 min.
- Roast dry fruits in ghee and keep aside.
- Boil the milk, then add the cooked foxtail millet rice and cook for 20 min. Further add sugar and stir slowly for 10 minutes until it is cooked.
- Add cardamom powder and decorate with dry fruits.
- Serve hot as a traditional sweet.

Foxtail millet (bread) -81



Preparation method

- In a large bowl, dissolve yeast in warm water. Add the sugar and keep its aside for 5 minutes.
- Add the foxtail millet flour, maida, eggs, milk and mix them into a smooth dough.
- Knead until it gets smooth and elastic nature, it is about 8 to 10 minutes.
- Further add activated yeast mixture, salt and oil to the above dough.
- Mix into smooth dough and place in a greased bowl.
- Cover and let it rise in a warm place until it gets doubled, about 90 min and set the oven temperature to 180 °C, 15 min.
- After 90 min fermentation time, punch down the dough onto a floured surface.
- Shape them into a loaf and place in a greased loaf pan and bake them at 180 °C for 30 mins.
- Remove from pan and cool them and cut them into loaves and pack

Foxtail millets (mango rice)- 82



Preparation method

Firstly, soak the foxtail millet rice for 1 hr in a bowl.

- Cook the foxtail millet rice in water (1:4) ratio in a vessel for 20-25 minutes.
- After cooking foxtail millet rice let it cool for some time.
- Take a sauce pan, add 4 tbsp oil and heat it for 5 minutes.
- Further add mustard seeds, black gram dal, ground nuts, green chillies, red chillies, curry leaves, turmeric, asafoetida and roast it for 5-7 min.
- Now add grated mango & salt to the above seasoned mixture and saute it for 2 min.
- Add the cooked foxtail millet rice and mix well for 2 min.
- Tangy mango foxtail millet rice is ready to serve hot.

Foxtail millets Vegetable biriyani -83



Preparation method

Firstly, soak the foxtail millet rice for 30 minutes in a bowl.

Then boil foxtail millet rice in four cups of salted boiling water with cardamom, cloves and cinnamon, until three-fourth done. Drain excess water and keep this flavored foxtail millet rice set aside.

Take a cooker vessel, add required ghee and melt it for 3-4 min.

Add green cardamom pods, cloves, black cardamom, caraway seeds and cinnamon along with bay leaf and roast it for 5-7 min.

Add ginger-garlic paste, tomatoes, onions, carrot, french beans, and half boiled green peas. Sprinkle salt, cover and cook on medium heat for 2 minutes.

Add turmeric powder, red chilli powder, coriander powder, garam masala powder and mix well for two minutes.

Arrange a layer of cooked & flavored foxtail millet at the top over that arrange half the cooked vegetables.

Sprinkle fried onions, lemon juice, food colour mixed in milk, coriander leaves and the mint leaves over the vegetables and rice.

Cover with a lid and cook. Let it stand for 30 minutes. Serve hot with onion raita and paneer curry.

NOTE: For chicken biryani in the place of vegetables chicken can be substituted, remaining whole procedure is same.



Recipes from CODO MILLET



KODOMILLET

Scientific name: *Paspalum scrobiculatum* (L.)

Hindi name: Kodon; Telugu name: Arikalu; Kannada name: Horka

Kodo millet was domesticated in India almost 3000 years ago. It is an annual tufted grass that grows up to 90 cm high. The grain is enclosed within hard, corneous, persistent husks that are difficult to remove. It has the highest dietary fiber amongst all the millets

It forms the main stay of the dietary nutritional requirements. It has high protein content (11%), low fat (4.2%) and very high fibre content (14.3%). Kodo millet is very easy to digest, it contains a high amount of lecithin and is excellent for strengthening the nervous system. It is rich in B vitamins, especially niacin, B6 and folic acid, as well as the minerals such as calcium, iron, potassium, magnesium and zinc. It contains no gluten and is good for people who are gluten intolerant. Regular consumption of kodo millet is very beneficial for postmenopausal women suffering from signs of cardiovascular disease, like high blood pressure and high cholesterol levels.

KODO MILLET COCONUT RICE -84



- Cook Kodo millet rice with water (1:2 ratio) for 20 minutes under medium flame and keep aside.
- Now take a fresh coconut and make a paste out of it.
- Take oil in a pan and add a mixture of mustard seeds and chana dal.
- Saute them together and add coconut paste to them.
- Mix them, sprinkle it with curry leaves, and green chilies. Saute all the ingredients together.
- Now add salt to taste and mix thoroughly.
- Now put the cooked Kodo millet rice into the pan and mix well.
- Cook for 5 minutes.
- Serve hot with tomato chutney

KODO MILLET (DHOKLA) -85



PREPERATION METHOD.

- In a bowl, mix kodo millet flour, besan, citric acid, turmeric, salt, and water, and make it into a smooth batter with a medium-thick consistency.
- Add oil and baking soda to the above mixture and mix well.
- Grease the steaming square/circular tin with oil and pour the batter into it.
- Steam it for 20 minutes and cool it.
- Cut them into pieces and keep aside.
- Take a pan and add 10 grams of oil, followed by a mixture of cumin seeds, mustard seeds, red chilies, and curry leaves. Fry it for 3 minutes.
- Add water to the seasoned mixture and boil for 5 minutes.
- Take a spoonful of above-seasoned water and pour on the Kodo millet dhokla pieces.
- Serve as a healthy and tasty millet breakfast.

KODO MILLET (FIRNI) -86



PREPERATION METHOD

- Soak the kodo millet grains for 4 hours and wash it properly.
- Grind the soaked kodo millet grains into fine paste by adding a little amount of water and keep aside in bowl.
- Separately, heat the regular milk in a pan until it comes to a boil, followed by a sim cook.
- Add kodo millet paste to the above- boiled milk while stirring continuously to prevent the formation of lumps.
- Cook the above mixture till it gives thick consistency and then add cardamom powder.
- Garnish it with crushed pista and then refrigerate for 1 hour.
- Serve as chilled and tasty Kodo millet phirni.



Wash Kodo millet flakes in water and then squeeze out the excess water using a muslin cloth.

- Mix all the mentioned ingredients with the above flakes to get a mixture.
- Make lemon shape balls out of the mixture.
- Slightly flatten the mixture balls with your palm to make a kodo millet poha Tikki.
- Dip the Kodo millet poha Tikki in corn flour slurry and roll them in bread crumbs.
- Heat oil in a pan and fry the tiki and cook on both sides till it becomes crispy.
- Serve along with some tomato sauce or mint chutney.



PREPERATION METHOD

Soak Kodo millet puffs in water for 5 minutes and drain the excess water after 2 minutes.

- Add oil in a cooking pan, fry cumin seeds, mustard seeds, hing and peanuts for 2 minutes.
- Add a mixture of chopped green chilies, onions, curry leaves, and turmeric powder to the above pan.
- Also, add tomatoes and salt to the above- sauteed mixture.
- Finally, add the Kodo millet puffs to the above pan.
- Off the flame and garnish it with roasted Bengal gram dhal powder and grated carrots.
- Serve hot as millet based healthy breakfast or snack.



Soak the kodo millet rice for 30 minutes in a bowl and keep aside.

- After that wash the grains properly and transfer to a vessel.
- Now boil water, add soaked kodo millet rice (1:5 water ratio) and cook for 20-25 minutes.
- After cooking, spread it on a plate to cool.
- Heat a pan, add black gram dal, red chillies, ground nuts & cumin. Fry till brown color, add the curry leaves and dry roast for few minutes. Remove from heat and leave it to cool. Grind it into a coarse powder.
- Heat 4-5 tsp of oil in a pan add cumin, hing, turmeric powder, peanuts followed by the addition of cooked kodo millet rice and cook for 2 minutes.
- Now add curry leaves ground powder and cook for 2 minutes.
- Mix well and serve hot with any raita

KODO MILLET (UPMA)- 90



PREPERATION METHOD

- Wash kodo millet two or three times, then drain the water completely and keep it aside.
- Heat the oil in a pressure cooker, add mustard seeds when it splutters, add blackgram da/, channadha/ curry leaves and green chillies.
- When da/ turns golden brown add onions, ginger, turmeric, saute till onions turns golden brown.
- Add carrots, saute for 2 to 3 minutes. Then add kodo millet, saute for 1 minute, till everything combines.
- Then add 4 cups of water and salt. When water starts boiling close the lid, and cook in moderate flame for 5 whistles.
- When pressure subsides, open the lid.
- Serve hot with any type of chutney or sambar



- Wash kodo millet rice and keep it aside. Also wash and chop all vegetables and keep it ready.
- Heat a teaspoon of oil in a pressure cooker. Add the whole spices and fry for a few minutes. Add curry leaves, chopped onions and fry till translucent.
- Add green chillies and ginger-garlic paste and fry for a 3-4 minutes.
- Add 5 cups of water and when water comes to a boil, add kodo millet rice, chopped methi leaves and cook till 4 whistle in medium flame
- Serve hot with some raitha.

KODO MILLET (POLAO) 92



PREPERATION METHOD

- Heat a small pressure cooker and saute with oil/ ghee and add cinnamon, fennel and bay leaf.
- Stir and add onion and ginger garlic paste.
- Add the chopped veggies, mint leaves, salt and saute it for 5 min.
- Add washed kodo millet to it, mix well and cook for 1 min.
- Add water, salt, bring to boil, mix well and cook for 4 whistles in medium.
- Garnish it with coriander leaves and serve hot with raita

KODO MILLET (coriander rice) -93



Preparation method

- Cook kodo millet rice in a pressure cooker with water, salt to taste and bay leaf at medium flame for 1 whistle.
- Prepare coriander chutney with minimum water. Chop all the vegetables.
- In a hot pan, take 1 tsp of oil. Add whole spices to it and fry for a minute.
- Add chopped onion and fry till translucent.
- Add chopped carrots and stir well, add coriander chutney. Cook the chutney till the raw taste of coriander disappears. Add salt to taste.
- Add the cooked kodo millet and mix evenly. Remove from flame. Note: millet rice has to cool otherwise it will become mushy.
- Serve hot with some raita.

Recipes from barnyard millet



BARNYARD MILLET

Scientific name: *Echinochloa crusgalli* (L.)P. Beauvois

Hindi name: Sanwa; Telugu name: Oodallu; Kannada name: Ooda/u

Barnyard millet is a good source of protein, which is highly digestible and is an excellent source of dietary fiber with good amount of soluble and insoluble fractions. The carbohydrate content of barnyard millet is low and slowly digestible, which makes the barnyard millet a nature's gift for the modern mankind who is engaged in sedentary activities. In it millet the major fatty acid is linoleic acid followed by palmitic and oleic acid. It also shows a high degree of retrogradation of amylase, which facilitates the formation of higher amounts of resistant starches. Hence it can be potentially recommended for the patients with cardiovascular disease and diabetes mellitus. Barnyard millet is most effective in reducing blood glucose and lipid levels.

In today's scenario of increased diabetes mellitus, this millet could become an ideal food. It is also an appropriate food for patients intolerant to gluten which causes celiac disease.

Barnyard millet (carrot truffles) -94



Preparation method

- Add grated carrots to the pan and saute them until raw flavour goes off.
- Add Sugar, close the lid and cook until it melts.
 - Open the lid, add barnyard flour, coconut powder & cardamom powder and mix well.
 - Take some portion of the prepared mixture and roll to make small lemon size balls.
 - Coat or roll the above barnyard millet carrot truffles into desiccated coconut powder.
 - Serve as a healthy millet snack.

Barnyard millet (dates milk shake)- 95



Preparation method

Soak the dehulled barnyard millet (50 g) overnight with 1:3 ratio of water.

- Wash the grains and grind to extract 50 ml raw milk from the soaked millet grains.
- Strain the milk by using a filter to remove any grain particles.
- Blend the regular milk to the barnyard millet milk and boil for 5-10minutes.
- Cool at room temperature.
- Chop dates & apples into small pieces and keep apple pieces in water.
- Add chopped dates & apples in a blender jar, paste it and keep aside.
- Add apple and dates paste to the boiled, blended millet milk, add cardamom, to the mixture.
- Blend until it gives a smooth blend and mixes well.
- Filter the above mixture and add Honey to the above mix.

- Now filter the above mix and freeze it for 30 minutes.
- Chilled barnyard millet milkshake is ready to serve as a healthy and tasty beverage.

Barnyard millet (mango milk shake) -96



Preparation method

- Soak the dehulled barnyard millet in excess amounts of water overnight.
- Wash the grains properly and grind the millets adding water in a 1:1 ratio (barnyard millet: water).
 - Extract the 100 ml milk from the barnyard millet and filter it.
 - Blend the barnyard millet milk to the regular milk and boil for 5-10 minutes.
 - After boiling, cool at room temperature and keep it aside.
 - Peel the mango and cut it into slices.

- Now add mango slices and Sugar in a blender and make a pulp.
- Add blended milk and mango pulp to the blender and mix it.
- Remove from the blender and filter it.
- Decorate with almonds/saffron, freeze for 30 minutes.
- Serve as chill healthy barnyard millet mango milkshake.

Barnyard millet (vanilla ice-cream) -97



Preparation method

- Soak the dehulled barnyard millet grains (30 g) in excess amounts of water overnight.
- Wash the grains properly and grind the millets adding water in a 1:1 ratio (soaked barnyard millet: water).
- Extract the 30 ml milk from the barnyard millet and filter it.
- Take fresh cream in a blender and blend till it becomes silky and fluffy.
- Add barnyard millet milk to the above mixture and blend again till it becomes fluffy.
- Add condensed milk, vanilla essence, and mix well.
- Transfer to a serving bowl and freeze it in the freezer for 8 hours.
- Take out and serve with the chill.

Barnyard millet (custard ice-cream) -98



Preparation method

- Firstly boil dehulled barnyard millet grains (100 g) in an excess amount of water and extract 100 ml of milk from it.
- In a large kadai, boil regular milk and barnyard millet milk gruel and occasionally stir for 15 minutes to get a perfect blend.

- Add sugar to the above mixture and stir well.
- Further, in a small bowl, dissolve custard powder and cornflour with regular milk.
- Stir well to get lump-free custard milk.
- Keep the low flame and add prepared custard milk to boiled, blended milk.
- Stir continuously until the milk curdles.
- Keep stirring till the milk thickens well. Keep aside to cool completely.
- Add a handful of Tutti frutti / any dry fruits and mix well.
- Transfer the prepared mixture into Popsicle moulds.
- Cover with the lid and freeze for 8 hours.
- Now dip the Popsicle in hot water for 10 seconds, for ease of removal.
- Finally, barnyard millet custard ice creams are ready to serve as delicious desserts

Barnyard millet (dora cake) -99



Preparation method

- In a bowl, add baking soda, sugar powder, honey, condensed milk & vanilla essence to the barnyard millet flour & make a batter (like Dosa batter).
- Heat 1 tbsp oil on a dosa pan, pour the batter & spread like small thick dosa.
- Cook on the first side until bubbles appear on the surface, the edges begin to look dry, and the bottoms are golden- brown.

- Melt the dark chocolate by double steamer and transfer into small bowl.
- Take a plate, put one pan cake and spread melted dark chocolate and repeat the same till 4-5 pancakes.
- Pour honey over this stacks of barnyard millet pan cakes.
- Now cut in pizza style.
- Serve like healthy breakfast or snack.

Barnyard millet (samasa pin wheel) -100



Preparation method

- Mix barnyard flour, mix proso millet rawa, salt, oil (1 tsp) and prepare dough with hot water (Chapathi dough).

Mash boiled potato and add turmeric, chilli powder, chat masala, pepper, salt, mix well & keep aside.

- Make Small chapathi with barnyard dough and spread potato mixture on it.
- Roll it and cut into small pieces.
- Press these pieces between two palms & deep fry.
- Serve as millet tasty snack

Barnyard millet (cutlet) -101



Preparation method

- Cook barnyard millet in boiling water and fluff it with a fork and keep it aside.
- Saute finely chopped onions, carrots, beans, green chilli, ginger- garlic paste in pan containing oil.
- Add salt, pepper powder, turmeric powder to the cooked vegetables.
- Mix channa dal flour powder with curd and add cooked barnyard millet, finely chopped coriander leaves and mix well. Mix it for further for 5-7 minutes
- Leave it to cool. Divide the mixture equally and shape into cutlet and shallow fry the cutlets both sides until golden brown or deep fry them in oil.
- Serve with tomato or chilli sauce.
- Cook barnyard millet in boiling water and fluff it with a fork and keep it aside.
- Saute finely chopped onions, carrots, beans, green chilli, ginger- garlic paste in pan containing oil.
- Add salt, pepper powder, turmeric powder to the cooked vegetables.
- Mix channa dal flour powder with curd and add cooked barnyard millet, finely chopped coriander leaves and mix well. Mix it for further for 5-7 minutes.
- Leave it to cool. Divide the mixture equally and shape into cutlet and shallow fry the cutlets both sides until golden brown or deep fry them in oil.

- Serve with tomato or chilli sauce.

Barnyard millet(kalajamun) - 102



Preparation method

- Mash khova & paneer together after mixing.
- Mix rawa to above mixture & knead it smoothly.
- Mix barnyard flour & Maida, add baking powder & soda to the above mixture.
- Mix properly and prepare a smooth dough.
- Cut dry fruits into small pieces, to this add one pinch of food color & 1 tsp khova.
- Make small balls of oval shape with the dough & and fill very small quantity of dry fruits mixture in it.
- Deep fry in ghee on low flame & dip in thick sugar syrup.
- Serve as delicious millet sweet.

Barnyard millet (gobi 65) - 103



Preparation method

- Clean Cauliflower and wash it in hot water.
- Put in boiling water for 5 mins.
- Squeeze out excessive water.
- In another bowl mix barnyard flour, corn flour, salt, chili powder, turmeric, food color & mix well.
- Add squeezed cauliflower to it and mix

Heat oil in pan

- Deep fry cauliflower after dipping in corn flour batter.
 - Heat 1 table spoon of oil in another pan add chopped ginger, curry leaves, green chilies, fry and add 2 table spoon curd to this & stir well.
 - Add fried cauliflower pieces to this well.
 - Make thin batter with corn flour using water.
- mixture & stir for 1 min. Serve like snacks.



Preparation method

- Soak the barnyard millet for 30 minutes in a large bowl.
- In a pressure cooker, put little oil and saute all spices along with ginger garlic paste.
- Now add chopped veggies and cook for 5 minutes.
- Add soaked barnyard millet rice to above vegetables mixture and stir for 3 minutes.
- Add 4 cups of water and cook for 5-6 whistles.
- Garnish with coriander leaves and serve with raita.

Barnyard millet milk cake -105



Preparation method.

- Take sauce pan, add dehulled barnyard millet and 5 cups of water to get 100 ml of gruel from these cooked grains. Strain it and store gruel for keep aside.
- Blend both barnyard millet gruel and regular milk and boil for 10-15 min.
- After boiling, add citric acid/lemon, keep stirring till curdling of milk.
- Add sugar slowly to this mixture and boil till water evaporates.
- Pour it on a greased plate or tray.
- Cool it and cut into pieces before serving

BARNYARD MILLET (PUDINA RICE) -106



PREPERATION METHOD

- Soak the barnyard millet for 1 hr in a medium size bowl.
- Cook barnyard millet in a sauce pan with 1:4 ratio water, salt and bay leaf at medium flame for 15-20 minutes.
- Prepare mint chutney with minimum water. Chop all the vegetables.
- In a hot pan, take 1 tsp of oil. Add whole spices to it and fry for a minute.
- Add chopped onion and fry till translucent.
- Add chopped vegetables and stir well, add mint chutney. Cook the chutney till the raw taste of mint and coriander disappears. Add salt to taste.
- Add the cooked barnyard millet and mix evenly. Remove from flame.
- Serve hot with some raita.

BARNAYD MILLET (PAYASAM) -107



PREPRATION METHOD

- In a vessel, cook barnyard millet rice with 1:4 ratio of water for 5-7 minutes (like half boiled).
- Now take another pan and boil milk for 10-15 minutes under medium flame.

- Then after add cooked barnyard rice and saffron to the boiling milk. Cook it for 10-15 minutes
- Add sugar and stir gently to cook millet Payasam.
- Heat ghee in a sauce pan, add all dry fruits, roast until golden colour and add to the cooked Payasam along with ghee.
- It can be serve as delicious sweet in hot or cold.



RECIPES FROM PROSO MILLET

PROSO MILLET

Scientific name: *Panicum miliaceum* (L.)

Hindi name: Barree; Telugu name: Varigalu; Kannada name: Baragu

Proso millet is a short season crop that grows in low rainfall areas. This millet can be cultivated along with red gram, maize and sorghum. It releases energy over a longer period of time after consumption allowing one to work from morning to evening without getting tired. The same is not true with rice. This has much protein, crude fiber, minerals and calcium.

Health benefits of proso millet comes from its unique properties. It is completely gluten free and has significant amounts of carbohydrate and fatty acids. It is cheaper source of manganese as compared to other conventional sources like spices and nuts. It contains high amounts of calcium which is essential for bone growth and maintenance. It has been shown to reduce cholesterol levels and also reduce the risk of heart diseases. It also prevents breast cancer among other diseases.

PROSO MILLET (KADDU KI KHEER)-108



PREPERATION METHOD

- Soak sago and dehulled prose millet in excess water for half an hour separately and drain the water.
- Grate the bottle gourd finely, boil it in water for 10 minutes.
- Prepare cashew nuts to paste by grinding cashew nuts and water in a grinder.
- In a vessel, add soaked Sago and prose millet in water and boil till it becomes soft and fluffy.
- After boiling, add cashew nut paste, condensed milk, sugar, and boil for some time in the above pan.
- Now add grated bottle gourd to the above mixture and cook for 10 minutes.
- Finally, add cardamom powder and turn off the flame.

- Garnish with almonds and pistachio nuts.

PROSO MILLET (MADHURWADA)-109



PREPERATION METHOD

- Take proso millet flour, rice flour, besan flour and maida in a mixing bowl
- Add onion, chana dal, and chilies, salt, curry leaves, coriander leaves, mix them well enough.
- Heat 2 tbsp oil in a pan and pour it over the above flour mixture.
- Add water to it, mix it well to get a soft dough.
- Grease hands with oil and make small balls out of the dough.
- Flatten balls over the greased palm.
- Deep fry them in hot Oil and occasionally stir under medium flame.
- Fry till the Proso millet Madhurawada turns a golden color and crispy.
- Finally, serve Proso millet, Madura Wada, with Coconut chutney/ green chutney

PROSO MILLETS (CHEESE BALLS) - 110



PREPERATION METHOD

Boil carrot, potatoes in cooker and cook for 4-5 whistles and mash it in a bowl.

- Add finely chopped green chilies, salt, ginger garlic paste, corn flour maida & proso millet flour and mix well.
 - Make square cheese pieces.
 - Take mashed potato, carrot & above proso millet mixture, make small balls, and flatten balls with cheese pieces. Make it into round balls.
 - Mix corn flour in water & keep it aside
 - Dip these balls in corn flour water batter & roll in bread crumbs
 - Keep all these cheese balls in fridge for 20 mins.
- Deep fry until they becomes golden brown color.
- Serve hot with tomato or chilli sauce.

PROSO MILLET (MANCHURIA)- 111



PREPERATION METHOD

- Grate all the vegetables in a vessel, also add little salt & boil in water for 15-20 minutes.
 - Squeeze water after 10 min of boiling and transfer into a bowl.
- Add ginger garlic paste, salt, chilli powder, soya sauce, vinegar, food color, maida, corn flour & prose millet flour.
- Mix well, make it into balls and deep fry them on low flame.
 - Heat oil, add chopped carrot, cabbage, onion, green chillies, garlic & add chilli, tomato & soya sauces to this mix.
 - Add 1 tsp of corn flour in $\frac{1}{2}$ cup water with above vegetable mix.
 - Lastly add Prose millet manchurian balls to this, mix well &serve hot.
 - Serve hot with any sauce.



PREPERATION METHOD

- Boil water, sugar and ghee together till sugar dissolves. Off the flame.
- Now add proso millet rawa, maida and milk, knead into a soft pliable dough.
- Divide dough into 4 parts.
- Roll into chapatti's 1/3" thick.
- Cut with a cookie cutter or knife into small diamond shapes.
- Lift with spatula and loosen. Keep aside on a dry cloth for 20 minutes.
- Deep fry in hot oil over a low flame till it turns light golden brown.
- Store in clean, dry containers.



Preparation method

- Prepare dough with prose millet flour and maida. Add small quantity of hot oil while dough making.
- Then add water slowly to make the soft dough.
- Roll the roti from the dough into 1 inch thickness and roll into the center.
- Cut the roll into small shapes (khajas).
- Add sugar to water (1:1) and boil till single thread consistency.
- Fry the prepared prose millet khaja in hot oil. Fry it turns into golden brown color.
- Excess oil is drained and put it on tissue paper.
- Add the prepared khajas in sugar and soak for 5 min.
- Serve as delicious prose millet khaja.

Proso millet (payasam)- 114



Preparation method

- In a vessel, cook barnyard millet rice with 1:4 ratio of water for 5-7 minutes (like half boiled).
- Now take another pan and boil milk for 10-15 minutes under medium flame.
- Then after add cooked barnyard rice and saffron to the boiling milk. Cook it for 10-15 minutes.
- Add sugar, jaggery and stir gently to cook millet Payasam.
- Heat ghee in a sauce pan, add all dry fruits, roast until golden colour and add to the cooked Payasam along with ghee.
- It can be serve as delicious sweet in hot or cold.

Proso millet (rawa idli)- 115



Preparation method

- Soak urad dal in water for 4-6 hr and drain out the water, grind it and keep aside.
- Simultaneously, soak proso millet rawa in a bowl for 30 minutes.
- To the black gram dhal batter, add proso millet idli rawa and allow it to ferment for overnight.
- After fermentation, add salt to it and mix well.
- Pour out the batter into greased idli moulds and cook in idli cooker for 10-15 minutes.
- Serve hot with coconut chutney and sambar.

Proso millet (burfi)-115



Preparation method

- Grease a plate with ghee and keep it aside.
- Add the jaggery in a pan with $\frac{1}{4}$ cup of water and heat it till gets single thread consistency. Keep it aside.
- Add little ghee in a pan, add proso millet flour and fry until it gives nice aroma.
- Then add the jaggery syrup and cardamom powder and mix it quickly.
- Add remaining ghee and stir continuously for 2-3 min or until the mixture leaves the pan's sides.
- Spread it on a greased plate and garnish with chopped nuts. Allow it to cool down and cut them into small pieces.
- Healthy and yummy proso millet burfi is ready



Preparation method

- Take Prose millet and of maida in a large bowl. Mix well and add required amount of hot water to make dough.
- Make small chapati balls and spread the dough with roller stick and cut into halves.
- In a sauce pan, add oil, cumin and mustard seeds on medium flame.
- To the above seasoning add turmeric, chopped onions, green chilies, curry leaves, boiled mashed potatoes, boiled peas and salt to taste. Cook for 10 minutes.
- After cooling, fill the above mixture in each prose millet half chapati and fold in triangular shape and deep fry it.
- Serve it hot with tomato sauce and chilli sauce.

Recipes from little millet



LITTLE MILLET

Scientific name: *Panicum sumatrense*

Hindi name: Kutki; Telugu name: Saamalu; Kannada name: Same

Little millet is grown throughout India and is one of the traditional crops. It is mostly mix cropped with other millets, pulses and oilseeds. It is generally consumed as rice and any recipe that demands staple rice can be prepared using little millet. This species of cereal is similar in habit to the proso millet except that it is smaller. It is an annual herbaceous plant, which grows straight or with folded blades to a height of 30 cm to 1 m. The leaves are linear, sometimes with hairy lamina and membranous hairy ligules.

Little millet is reported to have 37% to 38% of dietary fiber, termed as a nutraceutical and highest among cereals. Thus, it is a complete food ingredient suitable for large scale utilization as processed products, snacks, baby foods etc., and also plays a major role in propagating food security among under developed and developing countries.

Little millet sesame rice -117



Preparation method

- Cook rice into grainy and not mushy. Cool it completely.
- Add oil to a pan and heat it.
- Add mustard seeds, groundnuts, cumin seeds, urad dhal, and red chilies to the pan.
- Turn off the heat. Add sesame seeds powder and salt and mix well.
- Add cool and cooked little millet rice to the above mixture.
- Serve the little millet sesame rice with raita.

Little millet (badam milk) -118



Preparation method

- Place the raw almonds in a glass bowl and fill it up with filtered water. Allow them to be soaked for 8 hours.
 - Peel out the skin, put the almonds and water in a blender, and blend at low speed.
 - Blend them with less water for 1 - 2 minutes, so they become a smooth paste.
 - Soak the little Millet in water overnight and wash properly.
 - Grind the little millet grains by adding (1 :1) ratio of water and extract milk from it.
 - Filter the milk and keep aside.
-
- Add extracted milk to regular milk and mix it well and boil for 10 minutes.

- Add prepared almond paste and stir continuously for even mixing and then cook for 5 minutes.
- Slowly add sugar, cardamom powder, Saffron one by one and stir continuously till it gives a thick consistency.
- Cool it at room temperature and filter it through a strainer and garnish.
- Transfer it to the serving bowl and freeze it for 1 hour.
- Serve as yummy and chilled little millet badam milk beverage

little millet (cheese stick) -119



Preparation method

- Firstly, break the eggs and beat vigorously while adding pepper powder and salt to it.
- Mix the little millet flour and water to form a batter in another bowl.
- Open the cheese strings, cut it into finger size.
- Dip the cheese strings in little millet batter, followed by dipping in egg and roll over the bread crumbs powder.

- Heat a wide heavy bottomed vessel with enough oil for deep frying and once the oil is heated, place the coated cheese strings into the hot oil.
- Let the coated cheese strings fry on high flame till they rise to the surface.
- When they slowly turn into a golden color, turn them over gently to the other side and cook to a golden shade color.
- Use a ladle to remove the fried cheese strings and place them on to an absorbent paper and let it cool.
- Little Millet Fried cheese sticks are ready to serve.

Little millet (cold coffee) -120



Preparation method

- Firstly, soak dehulled little millet grains overnight and wash properly.
- Grind the grains by adding water (1:1) and extract milk from it.
- After extracting, filter the millet milk.
- Now boil regular milk along with little millet milk for 15 minutes, let it cool at room temperature.
- Add sugar, milk powder, coffee powder, ice cubes one by one to the millet milk blend.
- Transfer the mix to the mixer jar and blend well.

Take a serving glass and pour the above liquid.

- Pour the dark chocolate liquid on the sides of the glass.
- Decorate it with chocolate waffle sticks and freeze it for 2 hours.
- Serve as a healthy little millet cold coffee beverage.

Little millet (ginger morobba) -121



Preparation method

- Firstly, cook the dehulled little millet grains for 15 minutes in excess water and extract gruel from it.
- Strain the above little millet gruel and remove the grains.
- Transfer the gruel in another bowl and keep aside.
- Peel the outer layer of ginger, soak in water for 1 hour and chop the ginger into small pieces.
- Now add extracted little millet gruel and regular milk, chopped ginger in a mixer jar, and make a paste out of it.
- In a pan, add sugar and ginger paste and cook on a medium flame.
- Keep stirring until it starts leaving the sides of the container and switch off the stove.
- Grease a plate with oil and pour the hot mixture into it.

- While being warm, cut them into the required shape using different cutters.
- Little millet ginger murabba is ready to serve as millet candies.

Little millet (Mexican rice) -122



Preparation method

- Cook dehulled little millet rice with water (1:2 ratio of water) for 15 minutes and keep aside.
- Heat oil in a pan and add caraway seeds, cinnamon, cardamom pods, bay leaves, and fry.
- Add carrot, peas, beans, ginger-garlic paste, and Potato to above-sauteed spices.
- Add grated cheese and cooked little millet rice to the above pan.
- Finally, garnish it with coriander leaves.
- Preheat the oven and bake at 100°C for 15 minutes.
- Serve hot with tomato or soy sauce.

Little millet (sagu khichdi) -123



Preparation method

- Place sago in a perforated bowl and wash it under cold tap water until clear water appears.
- In a bowl, soak sago by adding excess water to cover them.
- Before cooking, drain off excess water and keep aside.
- Add dehulled millet rice (1:2) and water in a heavy-bottomed pan and cook it for 15 minutes.
- Now cook both little millet rice and soaked sago together for 10 minutes and keep aside.
- Heat the pan, add oil, peanuts, be gal gram dhal, cumin seeds, coriander leaves, green chili paste, salt and fry it for 5 minutes.

Add cooked rice, sago, and powdered peanuts to the above mixture.

- Mix well and keep on low flame and switch off the stove after some time.
- Little millet sago khichdi is ready to serve.

Little millet apple jam- 124



Preparation method

- Soak dehulled little millet for 2 hours in a bowl and cook in water (1:5 water ratio) for 10 minutes.
- Now extract 20 ml of gruel out of it by filtering/straining.
- Cut apple into pieces, boil until they become soft, then add sugar, cardamom powder, red color
- Then after add little millet gruel to it.
- Boil till it turns thick and translucent.
- Pour hot in bottle & cover tight.

Little millet (tea)- 125



Preparation method

- Soak dehulled little millet for 2 hour and wash it properly.
- Now grind the grains by using required amount of water and filter for 50 ml of little millet milk.
- Boil all the spices with tea powder and 1 cup of water in a vessel under medium flame for 10 minutes.
- Add sugar and little millet milk to above spice water.
- Filter and serve it hot.

Little millets (Chinese fried rice) -126



Preparation method

- Wash and soak little millet for 30 minutes.
- Cook for 15 minutes in 1:3 ratio of water and drain excess water so as to avoid lumps and leave it for cooling on a plate.
- Heat the oil in a pan, add ginger pieces, tomato, onion, green chillies, curry leaves, coriander, cauliflower, cabbage, turmeric, red chilli, beans, carrot, stir until its fried.
- Add soya sauce, red chilli powder, salt; again stir for ten minutes.
- Add cooked little millets and the mix, fry for two minutes.
- Garnish it with coriander leaves and serve hot.

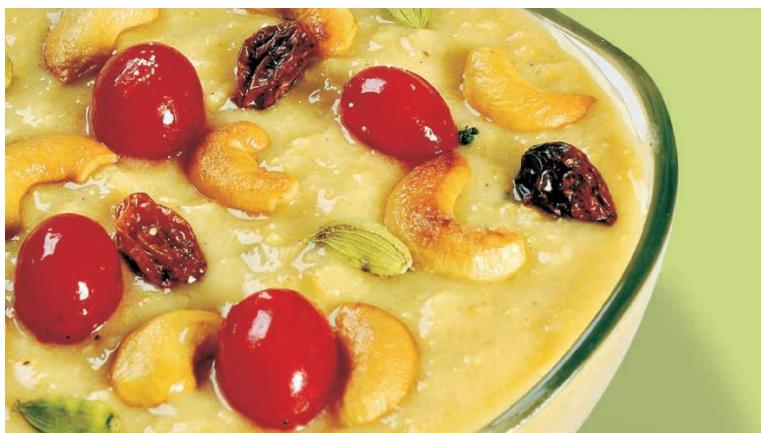
Little millet (kaju namkeen) – 127



Preparation method

- In a bowl add oil, ajwain, red chili powder, salt, chat masala, to the little millet flour.
- Mix well and make dough with hot water and keep aside for 15 min.
- Roll into chapatti's and cut into half moon shape with moulds.
- Gently put the above kaju namkin in hot oil for deep frying and fry till it gets golden brown colour.
- Serve as evening millet snack.

Little millet (payasam) - 128



Preparation method

- In a vessel, cook dehulled Little Millet with 1:4 ratio of water for 5-7 minutes (like half boiled).
- Now take another pan and boil milk for 10-15 minutes under medium flame.
- Then after add cooked barnyard rice and saffron to the boiling milk. Cook it for 10-15 minutes.
- Add sugar &jaggery to cook millet Payasam and stir gently.
- Heat ghee in a sauce pan, add all dry fruits, roast until golden colour and add to the cooked Payasam along with ghee.
- It can be serve as delicious sweet in hot or cold.



Preparation method

- Boil water in a vessel, add the millet and cook till millet becomes soft.

Then take the millet in a mixing bowl and mash it with curd. Mix it up well.

- Heat oil in a tadka pan and add the seasoning 'to temper' let it splutter.
- transfer the tempering to the rice along with grated chillie , coriander leaves and required salt. Mix it well.
- Serve chilled and garnish with pomegranates and coriander leaves.

Little millet (mashroom biriyani) - 130



Preparation method

- Dry roast the little millet for 1-2 minutes and keep aside.
- Grind the masala paste ingredients with little water to a fine coriander- mint paste. Keep it aside
- Heat ghee and oil in a deep bottomed vessel, add the ingredients to temper, and fry till aroma comes. Add the chopped onions and fry till golden brown. Add the ginger garlic paste, green chillies, red chilli powder, garam masala, salt and the coriander- mint paste. Mix well.

Saute well and then add the cleaned & chopped mushrooms, water (for mushrooms) and allow the mushroom to cook with the masalas.

Once it starts to boil, add the roasted little millet, water (for little millet), few coriander and mint leaves and check for salt.

Stir well and cover it with the lid and cook in low heat for about 25-30 minutes.

Serve hot with any gravy and onion raita.



Preparation method

- Cook little millet rice in a pressure cooker with water, salt to taste and bay leaf at medium flame for 1 whistle.
- Prepare mint chutney with minimum water. Chop all the vegetables and keep aside.
- In a hot pan, take 1 tsp of oil. Add whole spices to it and fry for a minute.
- Add chopped onion and fry till translucent.
- Add chopped carrots and stir well, add mint chutney . Cook the chutney till the raw taste of mint and coriander disappears. Add salt to taste.
- Add the cooked little millet rice and mix evenly. Remove from flame. Millet rice has to cool otherwise it will become mushy.
- Serve hot with some raita.

Little millet (tomato rice) - 132



Preparation method

- Soak the dehulled little millet in water for 30 minutes.
- Wash it properly, transfer into vessel containing water (1:5) and cook for 15 minutes.
- Heat oil in a sauce pan add mustard seeds, bengal gram dhal, and black gram dhal, let its splutter.
- Then add onion, ginger, green chilli, carrot, curry leaves and saute it for 5-10 minute
- Add tomato, turmeric and red chilli powder mix well till it becomes soft.
- Add cooked little millet rice and salt. Mix well and let it cook for 2-3 minutes.
- Now garnish with coriander leaves mix well and serve hot with coconut chutney or pickle.



Preparation method

Boil the water, add cumin seeds, sesame, and turmeric powder. Add the millet flour, combine with required water by stirring the mixture, cook for 5 minutes and turn off the heat immediately. Cover the lid and keep aside.

After cooling, knead the dough until a smooth texture comes.

Apply oil to the fingers and pinch a small lemon-sized ball of the dough and roll into a thick rope, which is approximately 3-4 inches in length and form a ring by pressing the ends of the rope firmly.

Heat a wide heavy bottomed vessel with enough oil for deep frying, and once the oil is heated, place the chekodis one by one into the hot oil froth up in bubbles. Let the chekodis fry on high flame till they rise to the surface.

When they slowly turn to a golden color, turn them over gently to the other side and cook to a golden color.

Use a ladle to remove onto an absorbent paper and cool. Cool completely before storing in an airtight container.

Multi millet chorafali - 134



Preparation method

Sieve all the flours separately.

Mix the above flours with red chilli powder, turmeric powder, baking soda, salt, required oil, and water.

Knead the very stiff dough. Cover it with a muslin cloth and keep aside for 10 minutes.

Take one small lemon sized portion of dough and give it a round shape. Grease it with little oil, place over the rolling board, and press it little to flatten.

Roll it out into a very thin circle (thinner than phulka roti). Do not use flour for dusting, grease dough balls with Oil to roll out. The rolled thin circle should look semi-transparent.

Take one rolled circle, make multiple 2-inch wide strips using a knife, and then cut all the center stripes.

Heat oil over medium flame for deep frying.

When Oil is medium hot, place 2-3 strips into it and fry until light brown and crispy. It will take a few seconds to puff up after adding them to the Oil.

Remove them by using a slotted spoon and drain excess oil. Transfer them to a plate and sprinkle red chilli powder over it.

Crispy millet chorafali is now ready for serving

Multi millet chum chum - 135



Preparation method

Firstly, prepare Channa by curdling milk with lemon juice and drain completely and hang for 30 minutes.

After 30 minutes, start to knead the paneer for 8 minutes.

Furthermore, make small oval balls of Channa.

Firstly, in a deep vessel, add Sugar and 200 ml of water. Boil the syrup for 10 minutes on medium flame.

Add cardamom pods for more flavor and add Channa balls into it.

After that, drop the prepared above channa balls into boiling sugar syrup.

Cover and boil for 15 minutes, and the paneer balls will have doubled in size.

Furthermore, keep aside till it cools completely.

Stuffing preparation:

Firstly, in a large non-stick vessel heat ghee. Further, add milk, skim milk powder, millet powder,

mix them continuously, keeping the flame on low to medium.

The mixture starts to thicken. Now add saffron milk (to prepare saffron milk, soak a few threads of Saffron in 2 tbsp of warm milk for 15 minutes.

Mix till the mixture forms a lump, and finally, now stuff is ready, then cool it completely.

Take Channa balls and split them in between withoututting them into half.

Stuff them with prepared stuffing gently.

Garnish with coconut powder, cherries, and Tutti frutti or dryfruits of any choice.

Take cooked paneer balls leaving behind the sugar water.

- I. Serve them as delicious sweets.

Multi millet (health mix) - 136



Preparation method

Powder:

- Roast each ingredient separately and grind them into a fine powder.

For drink:

Milk-100 ml, Multi Millet Health Mix Powder -10 g, Sugar-1 tsp.

Drink:

- Boil the milk and add Sugar.
- Pour some amount of water to the Millet based health mix until it gets thick consistency and pours it in boiled milk.
- Cook it for 5-10 minutes.
- Serve as a healthy beverage

Multi millet onion rings - 137



Preparation method

- Mix millet powder, wheat flour, green gram dhal flour, red chilli powder, pepper powder, salt, egg & milk/milk powder and make into a loose batter by using water.
- Heat the oil in a deep-fryer at 365 degrees F (185 degrees C).
- Separate the onion slices into rings and set aside.
- Dip the onion slices into the batter until they are all coated; set aside.
- Spread the bread crumbs out on a plate or shallow kind of dish.

- Place the rings one at a time into the crumbs, and scoop the bits up over the ring to coat.
- Give it a hard tap while removing it from the crumbs. The coating should cling very well. Repeat with remaining rings.
- They were deep-fried in the oil for 2 to 3 minutes, or until golden brown color. Remove to paper towels to drain Oil. Season with seasoning salt, and serve.
- Serve as a hot snack.

Multi millet (sesame laddu) - 138



Preparation method

- Dry roast the sesame seeds till they become brown color.
- Add grated jaggery and one tablespoon of water in the vessel and make it into a thick syrup.
- Now add the millet flour, ghee & sesame seeds in jaggery syrup and mix well
- By using water, make the mixture into lemon size balls.
- Cool it and serve as a healthy based snack.



Multi millet dates burfi - 139



Preparation method

Dry roast the finger millet flakes, sorghum flakes, cashew nuts, almonds, pistachio, poppy seeds separately.

- Afterwards, grind the finger millet flakes, sorghum flakes, almonds, cashew nuts and pistachio separately.
- Now make a powder by adding all roasted ingredients like millet flakes, almond powder, cardamom powder, coconut powder in a mixer.
- Deseed the dates and keep in a bowl.
- Add ghee in a pan, later add nutmeg powder, dates & millet flakes.
- Cook the above mixture for 15 minutes.
- Make a cylindrical shape (like burfi) and decorate with shreds of pistachio nuts and also poppy seeds.

Cover them with an aluminium sheet and freeze it for 30 minutes & serve with the chill.

Multi millets chocolates lava bomb - 140



Preparation method

- Melt the dark chocolate in the boiled (80 ml) milk
- Keep the above mixture in the freezer for 20 minutes.
- Take a big bowl, add millet flour, cocoa powder, sugar powder, baking powder, salt, vanilla essence, and boiled milk, mix it well until it changes color with batter consistency.
- Take an appam pan, grease it with oil, and then pour millet batter till half portion. Cook it on medium flame.
- Now place a scoop of prepared dark chocolate milk on the above-cooked batter and then again coat it with millet batter to get round shaped lava bombs.
- Fry it on both sides.
- Serve as a healthy millet snack.

Multi millets blueberry muffins - 141



Preparation methods

- Firstly, beat the eggs and sugar powder until it gives yellow-creamish color fluffiness.
- After beating, add butter and flour, baking powder to the above egg mixture, and mix properly in the blender for 15 minutes.
- Add Tutti fruity and beat the mixture.
- Finally, add the blueberry flavor in dropwise to the batter.
- Fill half the muffin moulds with batter.
- Preheat the oven at 200°(for 15 minutes.
- Keep the moulds in the oven and bake at 180°(for 30 minutes.
- Cool them at room temperature.
- Serve as millet bakery snacks.

Multi millets (strawberry mufins)- 142



Preparation methods

- Firstly, beat the eggs and sugar powder until it gives yellow-creamish color fluffiness.
- After beating, add butter, flour, and baking powder to the above egg mixture and mix properly in the blender for 15 minutes.
- Beat the above mixture.
- Finally, add the strawberry flavor in dropwise to the batter.
- Fill half the muffin molds with batter.
- Preheat the oven at 200°(for 15 minutes.
- Keep the molds in the oven and bake at 180°(for 30 minutes.
- Cool them at room temperature.
- Serve as millet bakery snacks.

Multi millet fried milk -143



Preparation method

- Mix granulated sugar along with millet rawa, corn flour in 3-quart saucepan.
- Now add milk to the above millet mixture.
- Boil over medium flame and stir constantly for a minute and remove from flame.
- Add butter to the boiled mixture and mix well.
- Spread evenly in ungreased square baking mould.
- Refrigerate uncovered at least 1 hour until it firms.
- After freezing, cut into cubes using wet knife.
- Dip custard squares into eggs mixture, then coat with bread crumbs.
- Heat oil, fry them in oil 1 to 2 minutes or until light brown; put on paper towels.
- Sprinkle with powdered sugar.
- Serve as millet based fried milk.

Multi millets chhena poda - 144



Preparation method

- Grease baking pan with some ghee.
- Preheat oven at 180°(for 15 minutes.
- Take fresh khova and crumble it very well.
- Mix sugar, and khova and make like chapatti dough.
- Add milk to this mixture.
- Add multi millet rawa, baking powder, white chocolate, almond and cashew nuts, mix well.
- Pour this mixture in the greased pan. Shake the pan gently so that this mixture spreads evenly. Level the top with spatula.

Place the pan in the oven and bake this for 35 to 45 minutes.

- Remove from the oven once done.
- Check if its baked inside with the help of a toothpick. There should be no sticky batter on the toothpick.
- Leave it for cooling the pan itself then remove it.
- Serve chhena poda as dessert or as a sweet snack.

Multi millet (loti choco pie) -145



Preparation method

- In bowl, beat eggs & mix with all the above ingredients except chocolate and make batter.
- Heat pan, add 1tsp oil on the pan and pour batter to make pan cakes.
- Apply melted chocolate on one pan cake & put another pan cake on this.
- Cut into pieces in pizza style.
- Serve as healthy multi millet breakfast.

Multi millet (Mirchi bhajji) - 146



Preparation method

- Thoroughly wash green chilies and make a long slit length wise, deseed and set aside.
- Keep chopped onion and coriander in above chillies.
- Heat oil in a pan for deep frying.
- In a large mix multi millet flour, besan flour, rice flour, salt, soda, turmeric, red chili powder and ajwain thoroughly.
- Add water little by little to get the right consistency, not thin and not too thick.
- Now dip each stuffed chilli in multi millet batter gently.
- Deep fry them in the oil till it turns golden brown.
- Serve them with some hot sauce.



Preparation method

- Take a pan, roast the urad dal till it turns golden colour and make it into powder.
- Now in the same roast multi millet flours for 15-20 minutes .Let it cool.
- In a mixing bowl blend those flours, add sugar powder, cardamom powder and ghee and mix well.

Now using with ghee make the above mix into ladoos.

- Serve as traditional multi millet ladoos.

Multi millet chocolate truffle laddu - 148



Preparation method

- Dry roast the millet flour for 15-20 minutes. Let it cool for 5 minutes.
- Melt white chocolate and butter together by double steamer. Off the flame.
- Then add coconut powder to it and mix it.
- Add roasted millet flour to the above mixture and make ladoos.
- Coat the truffle ladoos with coconut powder.
- Serve as millet delicious sweet truffle ladoo.

Multi millet idli - 149



Preparation method

Soak the black gram dhal for 5-6 hours in a bowl.

- Wash the black gram dhal properly and grind into idli batter.
- Also wash the multi millet rawa and soak for 30 minutes in another bowl.
- Now take a bowl, mix black gram dhal batter and soaked multi millet idli rawa.
- Cover the lid and rest it for overnight.
- Now mix the batter and add salt to it.
- Pour the batter on the greased idli moulds and steam it for 15-20 minutes.
- Serve hot with coconut-peanut chutney.

Multi millet bhel - 150



Preparation method

- Wash and soak the millets and kabuli channa in enough water for overnight in a bowl.
- Again wash the grains properly.
- Pressure cook them in medium flame heat till 3-4 whistles.
- Rinse the cooked millets and saute them on a low flame in little oil by stirring often. Off flame.

Now add the chopped onions, tomatoes, green chillies, salt, roasted cumin powder & chat masala. Mix well.

Finally add lemon juice over the millet bhel and serve.

Multi millet (paniyaram /pongalu)- sweet and spicy- 151



Preparation method

Soak all the ingredients for 2 hours in a bowl.

- Drain them and grind it into a smooth batter and ferment for 4 hours.
- Take the required amount of batter and add melted jaggery.
- Heat paniyaram pan on low-medium flame and add 1 tsp of oil in every well

Pour sweet paniyaram batter to the

$\frac{3}{4}$ of the well, cover the lid for 1 minute on low flame and flip paniyaram with the help of skewer or wooden stick.

After it gets cooked take out from the well and keep it in bowl.

Serve it hot and spicy paniyaram can also be made by adding veggies with tempering



Multi millet khakra - 152



Preparation method

- Boil water and add all the above ingredients together by mixing.

Make in to dough and roll in to small balls.

- Make the balls into small rotis.

Bake them in roti baker, baking on both sides.

Cool them and store.

Energy based millet -nutribar - 153



Preparation method

- Firstly, dry roast all the ingredients for 2-3 minutes separately.
- Melt the Jaggery by adding 1 tsp of water and boil until it gets thin slurry.
- Add honey and other ingredients.
- Fill the rectangular shape molds and keep in refrigerator for 10 minutes for binding.
- Preheat the oven at 200°C for 15 minutes.
- Keep the moulds in the oven and bake at 120°(for 15 minutes.
- Cool them at room temperature.
- Serve as a healthy millet snack.

Malted multi millet – health mix powder- 154



Preparation method

- Firstly, soak the sorghum, Pearl Millet, Finger Millet, and wheat grains separately overnight.
- Next day, clean the grains properly and keep them in a muslin cloth.
- Rest it for two days at room temperature and dry the grains in sunlight for 1-2 days.

Roast the grains separately and cool them at room temperature.

- Grind the dried grains into fine flour and sieve the flour.
- Also roast the ground nuts, cashew nuts, almonds, roasted Bengal gram, sago, and cardamom and cool at room temperature.
- Grind them separately and blend all the above flours and other ingredients.
- Keep the blended flours aside.
- Serve as healthy beverage powder.

Millet processing technology

Millets are a type of grain that can withstand the harsh conditions found in areas of Asia and Africa. They have a high level of insect and disease resistance. Millets are now regarded as a component of multigrain and gluten-free cereal goods in these locations, despite not being a substantial part of the average American or European diet. Millets have low bioavailability and poor digestion since they

naturally contain ant nutritional components. Consumers' concerns about nutrition and health are becoming more important while making food decisions.

The technology of processing turns the grain into a form that can be eaten, enhancing its quality. Unfortunately, the consumption of these crops is restricted, especially in non-traditional locations, due to a lack of knowledge about the best processing methods. This review study tries to comprehend millets' process capability, future potential, and technology. Traditional processing techniques for millets lack any type of standardisation and are labour-intensive, dull, harsh, and hygienic. By the development of fundamental technological inputs, such as suitable operating conditions, standardised process parameters, and equipment, the usage of millets was concentrated at the home and industrial levels.

Keywords – Millets, Processing equipment, Traditional, Advancement.

1. Introduction

Millets are said to be "Today's nutri-cereals and yesterday's coarse grains." Because, millets such as sorghum, pearl millet, finger millet, teff, proso millet, kodo millet, and foxtail cereals, are considered "future crops" due to their resilience to disease-causing illnesses prevalent in regions of Asia and Africa. These small-sized grains are significantly used as food and are making a strong comeback in the Indian grain producing sector after a long time, owing to their high nutritional value. India ranked first with an output of 334500 tons in 2010 out of the 762712 metric tons of millet grain produced globally (FAO, 2012). Also, Year 2023 is Celebrated as International Year of Millets, in manner to Keep its momentum going on. With an aim to create awareness and increase production and consumption of millets, Union nations at behest of Government of India, declared 2023 the International Years of Millet.

Nowadays millets are the world's top producer of the nutrient based value added product and placed at second position for pulses and rice. Due to their resilience under challenging agro-climatic conditions, millets are regarded as a crop of food abundance (Ushakumari et al., 2004). These crops offer significant demand for improving food and nutrition supply and enhancing the hierarchy of the food supply

They are nutritious, but they also provide health benefits that may be incorporated into a regular diet to help manage conditions regarding human health. (Veena, 2003).

Millets are a rich source of micronutrients, including minerals, B vitamins, and nutraceuticals. Although they are not a prominent part of the average American or European diet, they are gaining recognition as a valuable component in cereal products, especially gluten-free and multigrain millets, in certain regions. Millet, which is the main source of nutrition for people living in millet-producing areas of many Asian and African nations, is used to prepare a variety of traditional dishes such as idli, dosa, papad, chakli, porridges, breads, as well as infant and snack foods. These millet-based foods are known for their nutritional properties (Chandrasekara and Shahidi, 2011).

Despite the fact that many traditional dishes are prepared at home, millet growers are discouraged by the absence of widespread industrial use (Subramanian and Viswanathan, 2003). In order to increase nutrition, harvest health advantages, and encourage their widespread use as food, numerous nations, including India, China, the United States, and others, have now initiated research programs. Because millets contain natural anti-nutritional elements, they have a relatively low bioavailability of nutrients and poor digestion. Determining what to eat is increasingly influenced by consumer concerns over nutrition and health (Nehir and Simsek, 2012).

Currently, processing millet presents various challenges, but it also has the potential for creating innovative products using various technologies that can mechanize the process and produce nutritious foods according to customer preferences. This technological shift and changes in consumer food preferences could lead to the expansion of millet cultivation, preservation of ecological balance, assurance of food security, prevention of malnutrition, and scaling up the industrial use of millet grains.

Many millet-based technologies that CSIR-CFTRI has created have been successfully transferred to small and medium-sized businesses. This review paper is attempted to know millet based process ability, future scope and technology used for processing of value added millet products. (Jaybhaye et al.,2014)

2.Millet Processing Technologies:

The process of converting grains into edible forms and enhancing their quality is referred to as processing. In the case of cereals and millets, proper preparation is crucial. In India, millets are consumed in various forms such as porridge, chapatti, ladu, and other regional dishes. Since millet crops are primarily processed and used on a small scale at home, their beneficial nutrients are generally restricted to catmint production and remain unavailable to a big population.

One of the main causes of millet's low utilisation is an antinutritional component included in the grain. However, due to a lack of understanding about optimal processing, the consumption of these crops, particularly in non-traditional areas, is constrained. To minimise or eliminate these anti-nutritional elements that are found in various millets and transform them into edible form, a variety of time-honoured procedures have been used. Home practises that make use of everyday items considerably enhance the functional qualities while reducing the amount of antinutritional components. Before being consumed, millets are processed using a number of traditional methods. The majority of these methods lack any kind of standardisation and are manual, hard, boring, rough, and unsanitary. As a result, the processed foods/dishes do not maintain their uniformity.

Millets have important nutritional value, but because traditional practises lack a systematic scientific approach, they are not used in the commercial manufacture of processed and value-added products. Given these constraints, upgrading with appropriate scientific research is absolutely necessary. One potential effective strategy for this is the creation and introduction of equipment that is favourable to farmers and the optimization of the processing protocol.

Additionally, when designing and introducing machinery for various unit processes, it is important to consider the significant contribution that women make to household conventional processing. Since the beginning of time, various procedures listed in Table 1 have been used to remove antinutritional elements and change the taste of various species of millets. Before being used in households, various processes like soaking, dehulling, and cooking have been practised since the dawn of humanity.

The use of millets was focused from domestic to industrial levels through the creation of basic technological inputs in the form of adequate operating conditions, standardising process parameters, and equipment. Table 2 lists several innovations that have been made possible by the researchers' study of traditional customs. The following are the processing operations' unit-level

objectives and improvements over traditional home-scale practice. (Kate et al.,2021

Table 1: Traditional processing methods are used to make the most of millets and other underutilized crops.

Sr. No	Methods	Purpose	Technique used	Limitation
1	Winnowing	Removing of foreign material from desired fraction like straw, chaff etc.	Manual air blowing and winnowing	Low output capacity, weather dependent
2	Threshing	Segregation of grain and husks.	Beating method	High labour and time requirement, lower output efficiency
3	Germination	Changes in physiological form of grains to achieve nutritional value in grain	Using moist cloth	lower output capacity
4	Roasting	Enhance flavor and taste .	Used of khadhai and roasting pan.	Time consuming process.
5	Dehulling	Removal of husk	Wooden pounding	Reduce time & labor
6	Popping	To provide good flavor and taste with desirable texture.	Popping pans/ kadhai	Difficult to maintain accurate process condition. risk of unwanted combination, lower output
7	Soaking	Increase in moisture level to provide soft texture.	Water pounding	Weather dependent ,chance of unwanted contamination, less output capacity
8	Blanching	It slows the enzyme action which can cause loss of flavor color and texture.	Hot water or steam exposure	Heat sensitive nutrients and the production of effluents.



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Table 2: Advanced processing technologies for millets and other underutilized crops

S. No	Grain processing methods	Process description	Advantages of process	Equipment /technology available
1	Pearling	In this operation aleurone layer from dehusked grain is peeled/scratched off	Reduces non-digestible and off taste compounds	Mechanical peelers and millet mills
2	Decorticatio n/ Dehusking	The outer layer of husk removed from kernel of grain	Significantly reduces anti-nutritional factors	Decorticator and Dehusking machines
3	Cooking	Cooking is a process in which desirable changes taking place like starch gelatinization which makes them suitable for digestion and intestinal absorption	Required physicochemical changes taking place to make it suitable for digestion	Open vessel and pressure cooker
4	Grinding	Size reduction of the millet grains in different forms based on the targeted processed product	Grain converted into suitable form required for recipe	Millet mill, attrition mill
5	Roasting	In the roasting operation, the grains are exposed to intensive high heat for short time	Enhance the sensory qualities and decreased anti-nutritional constituents	Open pan, specially designed roasters

6	Puffing	In puffing whole unhusked or decorticated grains with defined moisture content is mixed with hot sand (250 °C, about 15–60 s)	Reduces antinutrients and enhances the taste and flavor. The operation also deactivate the bacteria and hence improves storage quality	In salt using open hot pan	
7	Sprouting	Soaking of whole undamaged grains for 2–24 h, and kept in humid space with desired humidity up to 24–48 h	Increases availability of micronutrients, improve digestibility, and reduces antinutrients	Incubators humidity chambers, germination	
8	Fermentation	It involves the combined process of steeping, germination, drying, toasting, grinding, and sieving	Resulted in the better digestibility of starch and improve availability of minerals	Malting unit	
9	Malting	In the fermentation process, growing specific strain of microorganisms at controlled conditions over the raw material as identified medium	Enhance the sensory qualities with improvement in nutritional value and digestibility. Also a considerable reduction in anti-nutritional constituents	Fermentation	

1) Machinery 1:



Millet Cleaner, Washing Machine (Capacity: 1000-1200 kg/hr)

2.1 Puffing Traditional puffing

Puffing is a traditional method of heating grains for use as breakfast cereal or snacks, either plain or seasoned with spices, salt, or sweeteners. This process is typically carried out in pots or kadhai with sand or salt-treated puffing. To achieve the desired popping and expansion, millets are soaked to the necessary

moisture level before being exposed to hot sand at a 1:6 ratio and high temperature (230-250 C) for a short duration (20-30 seconds).

Roasting of sand:

The method of cooking food on a divided surface or in a dry heat oven is known as roasting. Cooking with a split uses radiation heat; roasting in an oven mixes convection and radiation. Hot sand is used to expose pre-gelatinized cereals that is around 250°C in temperature during the sand roasting procedure. The sudden heat differential causes the starchy endosperm to expand, which leads to the evaporation of moisture inside the grains, trying to escape through the micro pores (Chinnaswamy and Bhattacharya, 1983). Bengalgram can be puffed as well if the grains are roasted with sand at 170°C for 75 seconds initially, then cooled for approximately 90 minutes to attain a moisture level of 14.9% (wb). After being submerged in water for 5 seconds, the tempered grains were de-husked and divided between a roller and a heated plate. The bulk amounts of grains grew when puffed under these conditions. (Pratare and Kurlien et al., 1986)

Advance puffing method

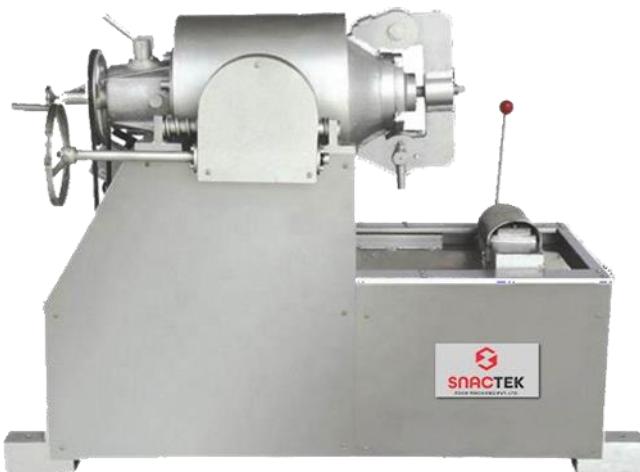
a. Gun Puffing

The cylinder was covered on one side with the steam inlet, while the opposing side had a heavy cast iron lid. The structural characteristics of pregelatinized rice flour produced by gun puffing were compared to those produced by hot air puffing for three varieties. It was discovered that the gun puffing method resulted in structural disintegration of starch granules, which affected the pasting properties (Mariotti et al., 2006).

Similar findings were reported by Mariotti et al. (2006) when they investigated the effects of the gun puffing method on various grains. Puffed rye and rice were discovered to have an extremely porous matrix with numerous cavities of varying sizes separated by puffed wheat with very thin walls, while emmer wheat and barley had a porous matrix. The process of filling the closed spinning chamber with superheated steam after preheating the milled grains in the cannon or high-pressure chamber is known as "gun puffing" (Luh, 1991).

The final texture of the puffed product is highly dependent on the steam pressure because too little steam pressure results in a product that lacks crispiness, and too much steam pressure results in rice shattering. The superheated steam cooks the grain while it is still semi-plastic, and the pressure is abruptly released at the end to create the crispy puffed grain. Keesenberg (1978) developed a puffing cannon consisting of a rotating horizontal cylinder with a length of 1.2 m and an inner diameter of 200 mm, which created a much more compact, uniform, and porous framework. Puffed buckwheat is characterized by an abundance of tiny, regular cavities.

2) Machinary 2 :



Gun Puffing Machine

b. HTST Fluidized Bed Puffing / Popping

Fluidized bed puffing is a process where a solid particle substance is placed in a holding vessel and is subjected to certain conditions that cause the mixture of solid and fluid to behave like a fluid. This allows for the product to be evenly exposed to the heating medium, making fluidized bed HTST puffing more efficient than other methods like hot air or conduction roasting or puffing in 1989, Venkatesh et al. created a fluidized bed puffing machine with a capacity of 20-25 kg/h that utilized the HTST process and had the ability to run continuously. The surface heat transfer coefficient is a critical factor in fluidized bed puffing, with a temperature range of 240°C to 270°C and corresponding exposure time. The

surface heat transmission coefficient plays a significant role in fluidized bed puffing at a temperature between 240°C and 270°C, with equivalent exposure.



Raw & Puffed Pearl Millet

c. Microwave

Microwave energy has been widely recognized as a source of thermal energy that has significant potential for processes like cooking, tempering, drying, heating, baking, blanching, popping, and puffing (Buffler 1993; Roussy and Pearce, 1995). The same popping and puffing technique used to prepare a variety of cereal grains is used to make microwave popcorn, which is a globally popular snack. The growth of starchy grains in the microwave is driven by moisture, as glassy starch swells and loses moisture upon heating (Boischat et al., 2003; Ernoult et al., 2002). The degree of gelatinization and moisture content of the starchy grains significantly impact the microwave product's form, expansion, bulk volume, density, and popping efficacy (Lee et al., 2000).

Extremely low and extremely high moisture levels may not result in the required expansion (Morau and Kokini, 2003).

During microwave expansion of cereal grains, the microwave energy transfers vibrational energy to moisture, resulting in the product's warming. This moisture is heated and creates superheated steam required for expansion. This steam builds up at the nuclei of the glassy matrix, leading to a relatively high pressure. When the superheated steam pressure becomes too high, the cereal matrix begins to yield and expand as it changes from a glassy to a rubbery state. When the microwave heating ceases and the matrix is no longer moist, it cools and returns to its glassy state, where the final structure solidifies. With too much moisture, the matrix becomes overly soft and disintegrates. Additionally,

microwave products may not expand as much as traditional methods because of their brief residence time and uneven heating pattern (Mishra et al., 2014)

2.2 Malting Traditional method

Malting historically, millet malt has been used to feed infants. Finger millet has excellent malting qualities, and Tamil Nadu and Karnataka both have a thriving malting industry the process of malting involves three sequential steps: steeping (immersing grains in water), germination (encouraging sprout growth and enzymatic activity), and kilning (drying the grains and halting enzymatic activity). This process has been shown to improve the nutritional content, fiber, crude fat, vitamins B and C availability, minerals, and sensory qualities of grains. At a floor malting, malt was traditionally produced. The grain was spread out on a vast floor area once it had been sufficiently saturated in water to begin germination. To regulate the temperature of the developing grain, the depth of grain on the floor was either thickened or thinned. Grain spinning or raking was necessary to remove the heat that grain germination produces. The kiln, which had a tall cone-shaped roof to create a natural air flow through the drying malt, was loaded with the malt once it had undergone sufficient modification. This labour was initially all done by hand in the early floor maltings, but as some mechanisation was gradually added, by the 1960s, machinery was being used to reduce the amount of manual labour required.

Advance method

These days, an integrated single unit is extremely common because it is quick, simple, and inexpensive to process. To ensure a uniform layer thickness in the integrated single malt, the grains are spread out on grain retaining sieves (Kumar et al. 2016). Water sprinkling arrangements at the top provide the necessary water for soaking the grains. The soaking water is changed three to four times during the steeping period, and the bottom valve is opened to allow fresh water to aerate the soaked grains. After the steeping process, the bottom valve is opened to drain all the water, and the grain is left to germinate on the sieves. Finally, for the last stage of malting, or drying, the side valve is opened, and hot air at the proper temperature enters from the side, passing through the sieves to uniformly distribute and dry the grain. The malting unit is obtained once the sieves have been removed from the unit. (Kumar et al., (2016))

2.3 Fermentation

Traditional Fermentation method

Millets are traditionally processed through fermentation, which has been practised for ages across a wide range of countries. Millets' nutritional value is enhanced by fermentation, which reduces complex carbs and proteins into more easily absorbed forms. Millets' flavour and aroma are also improved by it. These are a few conventional techniques for millet fermentation:

- 1) Souring: The millets are soaked in water for a few days until they begin to ferment using this straightforward technique. The millets are then rinsed, dried in the sun, and drained. This technique is widely employed in India and results in millets with a sour flavour that are utilized in a variety of cuisines.
- 2) Sprouting and fermentation: Millets are first sprouted in this procedure, which is followed by a few days of fermentation. Before sprouting, the millets are first steeped in water for a few hours. After being dried, the sprouted millets undergo a brief fermentation period. This technique is widely employed in Asia and results in a porridge known as kanji or koozh, which has a mildly sweet flavor.
- 3) Yeast fermentation: Adding a starter culture of yeast to the millets and allowing them to ferment for a few days constitutes the yeast fermentation method. By combining millet flour and water and letting it ferment for a few days, yeast culture can be created. The millets are then combined with the fermented millet flour, and the mixture is left to sit for a few days. This process creates a sour-flavored porridge known as uji or kenkey that is widely utilized in some regions of Africa.

The preservation of regional food traditions and the advancement of sustainable agriculture depend on the continued use of these age-old millet fermenting techniques.

Advance methods-

Although fermentation is a valuable traditional food preparation technique, it has some drawbacks and disadvantages, such as the risk of foreign microorganisms that can cause food-borne illnesses and intoxication. This is particularly concerning when using contaminated raw materials or poorly managed fermentation conditions. However, these limitations can be overcome by shortening the processing time through the use of cutting-edge technologies, which can make fermentation safer and more effective.

One advancement in millet fermentation technology is mixed-culture fermentation, where the use of multiple strains of microorganisms can increase the output of the finished product while enhancing its sensory qualities. Another novel technology is "Very High Gravity" (VHG) fermentation, which can boost ethanol production and profitability on an industrial scale. Additionally, extrusion and other technologies can be combined with millet fermentation to create unique products while streamlining the time-consuming fermentation process. However, the application of thermal and non-thermal modern approaches to millet fermentation has not been fully explored. Combining these techniques with traditional millet fermentation technologies may lead to safer and more efficient fermentation, resulting in a greater variety of fermented millet products on the market. (Kumar et al., 2021)

2.4 Roasting Traditional methods

Millets are frequently processed via roasting in many traditional communities. Grains that have been roasted are easier to digest, have improved flavour and aroma, and it helps to remove the husks from the grains. For millets, some conventional roasting techniques are as follows:

- 1) Open flame roasting - Open flame roasting entails roasting the millet grains in a skillet or on a skewer over an open flame. To ensure even roasting, the grains are continuously tossed or flipped. The millets get a smokey flavour and perfume thanks to this process.
- 2) Sand roasting - Millet grains are heated up to roast in this process. In a skillet or saucepan, the grains are combined with hot sand and continuously stirred until they are evenly toasted. Using this technique results in a crunchy texture and nutty flavor in millets (Kora et al .,2019)
- 3) Oven roasting - Millet grains are roasted in an oven using this method. The grains are equally distributed on a baking sheet and roast for a short period of

time at a high temperature until they turn golden brown. The millets get a crispy texture and a toasted flavour as a result of this process.

4) Dry roasting -Dry roasting entails roasting the millet grains by not utilizing any fat or oil in dry pan or pot. Until they are evenly roasted, the grains are constantly tossed. The millets get a nutty flavour and perfume thanks to this process.

The choice of procedure depends on personal preference and regional customs because each of these techniques yields a different flavour and texture in the roasted millets

Advance methods

In addition to conventional roasting techniques, innovative roasting technologies are available for millet processing that are more effective and can yield roasted millets of a consistent quality. Among these cutting-edge roasting technologies are:

1) Fluidized bed roasting: In this technique, millet grains are suspended in a stream of hot air or gas, which swiftly and evenly roasts them. To achieve the required level of roasting, the grains are cooked for a set amount of time and at a certain temperature. When compared to conventional roasting techniques, this process is effective, consistently provides high-quality results, and uses less energy. (Shingare et al., 2013)

2) Infrared roasting:- Millet grains are roasted using infrared radiation in this process. The grains are put on a conveyor belt and moved through an infrared radiation chamber where they are heated for a predetermined amount of time and at a predetermined temperature. This process yields roasted millets of a consistent quality and is quick and effective. (Shingare et al.,2013)

3) Microwave roasting: Millet grains are roasted using a microwave in this technique. The grains are roasted in a microwave oven at a particular power level and timing. This process yields roasted millets of a consistent quality and is quick and effective.

4) Drum Roasting-Millet grains are roasted using this technique in a rotating drum. The grains are tumbled inside the drum while it is heated from the outside

to guarantee equal roasting. This process yields roasted millets of consistently high quality and is effective.

5) Vacuum roasting: Using this technique, millet grains are roasted in a low-pressure setting. The grains are roasted at a certain temperature and duration in a vacuum chamber. This process gives the millets and other grains a distinct flavour and scent. (Kaur et al.,2022)

These cutting-edge roasting techniques are more effective, create roasted millets of a high standard, and can be applied to industrial processing. Unfortunately, they are more expensive and might be difficult for small-scale farmers to get. The selection of roasting technology is influenced by regional factors, resources, and technological accessibility.

2.5 Threshing

Traditional Threshing Methods

The process of threshing, which includes separating the grains from the husks or stalks, is crucial to the processing of millet. For millets, conventional threshing techniques include:

- 1) Hand threshing: Manual threshing entails striking the harvested millet stalks with a wooden stick or a hard surface to remove the grains from the stalks. It takes a lot of physical work and is labor-intensive.
- 2) Threshing with animals: threshing livestock Millets are threshed in some traditional villages using bullocks, horses, or donkeys. To separate the grains from the husks, the stalks are linked together and dragged across the grains.
- 3) Threshing with machines: To separate the grains from the stalks, some regions employ simple machinery like pedal-operated or motorised threshers. Although these devices are more effective than manual approaches, they might not be convenient to use in isolated or rural places.
- 4) Threshing with sieves to separate the grains from the husks, millet stalks are shaken over a mesh or sieve during the threshing process. It is a straightforward and affordable technology that small-scale farmers and individuals can use with ease.

5) Sun-drying and threshing: In some regions, millet stalks are threshed after a few days of sun-drying. The grains are subsequently separated from the husks by beating or trampling on the dried stalks.

6) Depending on the local circumstances and available resources, each of these strategies has pros and cons. It is crucial to select the most effective strategy based on aspects including cost, effectiveness, and the availability of resources. (Gbabo et al., 2013)

Advance threshing methods

There are more innovative, labor-saving threshing techniques for millet processing in addition to conventional ones that are more effective. Some of these techniques consist of:

1. Mechanical threshing equipment: From little motorised threshers to massive combine harvesters, modern mechanical threshing equipment is available in a variety of sizes and capabilities. To separate the grains from the stalks, these devices rotate threshing cylinders or drums with connected teeth. They can handle a lot of millet and are quick and effective





Mechanical Threshing

2. Pneumatic threshing: Using air, pneumatic threshing separates the grains from the husks. The air is blown through the millet stalks as they are fed into the apparatus, which separates the grains from the husks. This process can handle big amounts of millet and is less harmful to the grains.

3. Electrostatic separation: This technique separates the grains from the husks using electrostatic charges. The grains of millet break from the husks after being run through a machine that charges them with static electricity. This process yields grains of excellent quality and is quick and effective.

4. Vibratory threshing: This technique separates the grains from the husks using mechanical vibrations. The stalks of millet are fed into a device that vibrates them, separating the grains from the husks. This process can manage a lot of millet while being kind to the grains.

5. Laser-based threshing: In this process, the husks and grains are separated using lasers. The millet stalks are fed through a device that burns the husks with lasers while leaving the grains unharmed. Although it is still in the experimental stage, this procedure is quick and effective.

Although these modern threshing techniques are more labor- and time-saving than older ones, they also need more investment and might not be readily available to small-scale farmers. The threshing method chosen will depend on the environment, resources, and technology that is available in the area. (Tiwari et al,2020).

2.6 Dehulling

Definition :

Millets' small size and husk make dehulling (removal of husk) a challenging job. Without husk removal, it is difficult to explore the full potential of the grains.



Small Scale Dehuller

Traditional method: -

It involved Pounding the grains with a pestle in a stone or wooden mortar. Women have traditionally performed this disagreeable, taxing, and wasteful task. A woman can physically dehull 1.5 kg of grain in an hour with a pestle and mortar, resulting in a non-uniform kernel with poor keeping properties. To create flour that is slightly moist due to moisture, dry, moistened, or wet millet grain is commonly pounded with a wooden pestle in a wooden or stone mortar. A critical element of the desired output is the proper level of moisture in the grains before they are dehulled. Hence, about 10% moisture is required for effective separation of the germ and endosperm and detachment of the fibrous bran. Dehulling millets removed the undesirable components, which also improved the

bioavailability of the minerals already present, reduced the quantity of anti-nutritional elements, and improved consumer appeal

Advance methods

1) Roller miller

For different kinds of millets, there are numerous dehullers, decorticators, and peelers available. In contrast to the traditional difficult, exhausting manual activity, these motorized mechanical devices perform a tremendous quantity of work.

Abrasive type:

The primary use of this decorticator type is to eliminate the outer husk or bran from cereal surfaces. The abrasive disc or roller is the key functional component that generates friction and abrasion forces on the grain's surface, resulting in the removal of the fibrous pericarp hull or bran as either fine powder or coarse flakes. Individual grains are abraded to differing degrees at various surface spots as a result of the nonuniformity in the grains, which can occasionally result in additional endosperm loss. When it comes to damaged grains, such events are fairly common even at relatively low levels of abrasion. Some of the common millet machines are recommended depending upon which millet grains are suitable for them.

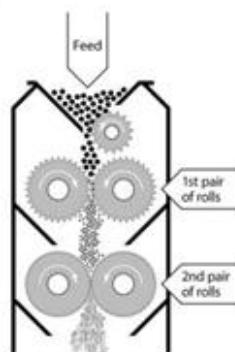
Rolling mills:

In this equipment, pearling is often carried out by introducing the grains between a pair of steel rollers that rotate inside a cylindrical chamber at either constant or varying speeds in a counter-directional manner. When correctly tempered grains come into contact with revolving rollers, the pericarp is scraped against neighboring grains and sheared against the surface of the roller. The distance between the rollers can be adjusted to control the degree of pearling and particle size in the flour. To prevent the loss of both edible material and machinery, it is critical to maintain appropriate temperature and moisture levels for the grain.
(Kate A. and Singh A. et al., 2021)

2) CIAE millet mill

The CIAE-Millet Mill was devised and created by ICAR-CIAE Bhopal with the goal of processing millets without the repetition associated with the conventional approach. The machine can process millet grains with a moisture level of 10-12% at a rate of 100 kg/h. The mill is powered by a one-horsepower electric engine. The mill's versatility allows for the processing of different quantities of millets, making it possible to dehusk even a single kilogram of grains in one go. It is capable of effectively removing the husk from a variety of commonly used millets including kodo millet, proso millet, foxtail millet, small millet, barnyard millet, and more. The machine's adjustability in terms of the distance between dehusking surfaces makes it well-suited for a broad range of millets.

This machine has a dehusking effectiveness of roughly 95%. Any dehusking fraction cannot leak out into the open because of the enclosed processing area that is connected to the cyclone separator. Similar to this, machine activity results in minimal air and noise pollution. The machine is also user-friendly for women, straightforward to use, and doesn't require skilled labour; as a result, it may be used at both the home and production levels. (Kate A. and Singh A. 2021)



Advanced Millet Dehuller

(Capacity : 2000 – 6000 kg/hr)

2.7 Grinding -

Breaking up particles is done by grinding. The solid mixture is ground into a granular state. To create a fine-grained powder in chemical operations, crushing is frequently followed by grinding. Particles are broken up during grinding.

Traditional methods-

While grinding millets the traditional way, a variety of equipment and processes that have been utilized for generations in many civilizations around the world are used. A family of small-seeded grasses known as millets is a common food source throughout much of the world. Millets are often ground into flour, and there are various conventional techniques for doing so.

1. Stone grinding- One of the earliest processes for grinding millets is stone grinding. The millets are ground using two flat stones in this way. The lower stone receives the millets, which are then ground into flour by the higher stone. In numerous rural areas of India and Africa, this technique is still in use.

2. Mortar and pestle- Using a mortar and pestle is another conventional technique for grinding millets. Millets are ground into flour with this technique by placing them in a mortar and crushing them with a pestle. In a lot of places in Asia and Africa, this technique is still in use.

Hand-Cranked Mill- Grinding millets using a hand-cranked mill is another common practice. The millets are ground into flour using a hand-cranked mill in this technique. The mill's hand crank is used to grind the millets once they are added to the hopper

3. Hand-Cranked Mill- Grinding millets using a hand-cranked mill is another common practice. The millets are ground into flour using a hand-cranked mill in this technique. The mill's hand crank is used to grind the millets once they are added to the hopper.

4. Electric Mill- Today, grinding millets in electric mills is a common practice. The millets are ground into flour in electric mills using a motor. Although this procedure is quicker and more effective than conventional methods, it is less frequently utilized in rural regions since electricity may not always be accessible there. While being slower and labor-intensive overall than modern processes, traditional methods of milling millets are still widely employed due to their dependability and cost.

Advance methods-

There are innovative millet processing techniques as well as conventional ones, utilising more recent machinery and technology. In comparison to conventional procedures, these approaches provide a number of benefits, including increased productivity and

improved millet flour quality. These are a few instances of cutting- edge millet processing techniques:

1. Hammer milling: Processing millets often involves the use of a hammer mill. The millets are ground into flour using a high-speed rotating hammer in this process. A hopper is used to feed the millets into the hammer mill, which then turns them into fine flour



Hammer Millet Milling Machine (Capacity: 250 – 300 Kg/hr)

2. Roller milling: Another technique for preparing millets is roller milling. With this technique, the millets are put through a succession of rollers to be crushed and ground into flour. Compared to conventional techniques, the roller milling process is more effective and results in a more reliable output.

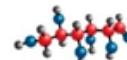
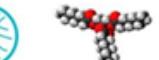
3. Jet milling: This technique entails pulverising millets into flour with high-pressure air jets. High-quality millet flour products are frequently made using this procedure, which yields very fine, homogenous flour

4. Ultrasonic milling: It is a more recent technique for processing millets. The millets are broken down into flour using ultrasonic vibrations in this process. Ultrasonic milling is a very effective technique that generates very little heat while producing very fine grain

Overall, there are a number of benefits to using modern millet processing techniques over older ones. These techniques are quicker, more effective, and result in a more

reliable output. Unfortunately, they also cost more and require more specific tools and knowledge. (Yawatkar et al.,2010)

- Effect of Different Processing Technologies on Nutritional Content of Millet.

	 Energy	 Carbohydrate	 Protein	 Minerals	 Dietary fiber	 Fat	 Vitamins	 Antioxidants
Dehulling	↓	↑	↓	↓	↓	↓	↓	—
Milling/Sieving	—	—	↓	↓	↓	↓	↓	—
Soaking	—	↓	—	↑↑	—	↓	—	↓
Germinating	↑	↑↑	↑	↑	↑	↑↑	↑	↑
Malting	—	—	—	—	↑	↓	—	—
Fermenting	—	↑	↑	↑	↑	↓	↑	—
Roasting	↓	—	↓	↑↑	↑↑	↓↑	—	—
Extrusion	↓	↓	↓	—	↓	—	—	—
Cooking	↓	↓	↓↑	—	↑	↓	—	—
Puffing/ Popping	—	—	↑	↓↑	↓	↓	—	—

Note: (↑):increases, (↓):decreases, (↑↑):decreases or increases, (—): data not available (Reference source: above manuscript)

Conclusion: -

Millets have been an important part of the Indian diet for centuries, and traditional processing technologies have been used to make a wide range of millet-based foods. These technologies have been passed down from generation to generation and have helped preserve the nutritional value and unique taste of millets.

In recent years, with the increasing demand for processed foods and the need to increase millet consumption, advanced processing technologies have also been developed in India. These technologies have made it easier to process millets on a large scale and have led to the development of new millet-based products that are more convenient and appealing to consumers.

Overall, both traditional and advanced processing technologies have a role to play in the promotion of millets in India. While traditional methods help preserve the cultural significance and nutritional value of millets, advanced technologies can



help increase their accessibility and make them more widely available to consumers

