

## Finger Millets: The Miracle Millet

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One of the most widely grown millets is finger millet (*Eleusine coracana*), and India leads the globe in output, accounting for over 41% of global production, with Africa coming in second. After sorghum, pearl millet, and foxtail millet, finger millet is the fourth most important millet in the world. One of the minor cereals that is native to Ethiopia and is widely grown throughout India and Africa is finger millet, also known as ragi and mandua in India. It is a staple food that provides a significant amount of calories and protein to a large portion of the populations in these countries, particularly those from low-income families. *Eleusine coracana* L., also known as ragi or finger millet, is a popular millet in many parts of India. It has historically been a significant millet staple food in portions of eastern and central Africa as well as India. It is also frequently known as Koracan in Sri Lanka and by many names in Africa (FAO, 1995). In the past, finger millet was processed in India using techniques including grinding, malting, and fermentation to make drinks, porridges, roti (unleavened flat bread), dosa (fermented pan cake), and idli (fermented steamed cake). Studies show that ragi is an excellent source of several different nutrients, including calcium, magnesium, methionine, lysine, fibre, and amino acids. Consuming ragi regularly can help prevent and treat a number of health problems, including weight loss, type II diabetes, cardiovascular disease, gastrointestinal

cancer, skin ageing, hair loss prevention, blood circulation regulation, haemoglobin level control, and gut health.

### Nutritional Composition of Finger Millet

When finger millet is compared to the two other primary grains in the world, rice and wheat, it is noticeably higher in micronutrients such vitamins and minerals. The best source of calcium is finger millet in particular, which has three times more calcium than milk and ten times more than wheat, maize, and rice.

**Table 1:** Nutritional Composition of Finger Millet

S.No.	Parameter	Proximates
1.	Moisture (g)	12.1
2.	Protein (g)	6.3
3.	Fat (g)	1.3
4.	Minerals (g)	2.7
5.	Dietary fiber (g)	9.5
6.	Carbohydrates (g)	68.0
7.	Energy (Kcal)	328
8.	Calcium (mg)	344

### Production Of Finger Millet In India

Finger millet, also referred to as ragi, is an important crop for smallholder farmers in semi-arid and tropical regions of India. The country is one of the world's top producers of finger millet, with the leading states cultivating it being Karnataka, Tamil Nadu, Andhra Pradesh, Maharashtra, and Telangana. The crop grows well on marginal lands with low fertility and random rainfall, so smallholder farmers in these regions rely heavily on it for their livelihood. The process of producing finger millet usually entails sowing the seeds during the monsoon season, with harvesting taking place three to four months later. Even though finger millet is a robust crop, growing it presents difficulties due to pests, diseases, and restricted availability to better cultivars and agronomic techniques. But as a result of initiatives by NGOs, government organisations, and research centres to advance better farming methods, create high-yielding cultivars, and spread knowledge of

finger millet's nutritional advantages, the grain is becoming more widely grown and consumed in India.

### Sowing

**The Sowing Period:** It may be grown as a transplanted crop on well-drained soil in an area with heavy rainfall. It may be cultivated in both irrigated and rainfed environments. It is cultivated across the nation in all cropping seasons. Over 90% of the land is cultivated in the kharif season and is rainfed. June is when it typically grows in Uttaranchal.

**Distance:** The yield will be reduced by either a higher or lower yield than the ideal population. Use a 25x15 cm spacing for the best population (25 cm between rows and 15 cm plant to plant distance).

**Depth of Sowing:** Seed should be sowed no less than 3–4 cm.

**Technique for planting:** One method of manually sowing is broadcasting line sowing. Drilling for field transplants

### Cultivation and Harvesting of Finger Millets In India

Usually, cultivation starts with land preparation, which involves plough work and levelling the soil to provide a good seed bed. Although ragi may grow in a variety of soil types, it likes soils that have a high organic content and adequate drainage. When the rainy season begins, farmers typically plant ragi seeds straight into the ground since they need enough moisture for germination and early development. Compared to other cereals, the crop requires less watering and is hence considered low-maintenance. Ragi may require weeding during its growth cycle in order to avoid competition for nutrients and space. Ragi ripens in three to five months, depending on the type and the climate where you live. The plant has a distinctive height of one to two metres, and its slender stalks are topped with panicles loaded with grains. Ragi grain turns from green to a distinctive reddish-brown or grey as it ages, signifying that it is ready to be harvested. When the panicles start to droop and the grain is fully mature, harvesting usually takes place. To trim the stalks, close to the ground, farmers utilise manual sickles or mechanised harvesters. Grain is threshed after it is harvested in order to remove the seeds from the stalks.

The harvested stalks can be threshed manually by beating them, or mechanically with threshing machines. After the grains have been separated, any leftover chaff or debris is winnowed out. Ragi grains have several uses in the kitchen; they may be used into porridge, flour for baking, or the foundation for fermented dishes like dosa and idli. Because of its flexibility, resilience, and nutritional content, ragi is an important crop for food security in many areas.

### Uses of Finger Millet

The main grain consumed by India's rural populace, particularly in the south, is ragi. Usually, it is made into flour and used to make ragi dosa, a pancake, ragi "muddae," a porridge, etc. Additionally, the grain is malted, and the malted grain flour is fed to sick people and babies as a nutritious meal. The amylases that are released during malting dextrinize the starch in grains. The creation of a pleasant scent during the kilning of the germinated grain is an additional benefit of malting ragi. "Ragi malt" is the term for malted ragi flour that is used to make milk drinks. In some regions of the nation, the grain is also used to make a fermented beverage. Its high soluble fibre content and outstanding thickening qualities make it an excellent choice for use in ice cream making.

### Health Benefits of Finger Millets

Finger millet, sometimes referred to as ragi, has a high nutritional profile that makes it beneficial for many health conditions. Here are a few of the main health advantages:

- **Rich in Nutrients:** Carbohydrates, proteins, dietary fibre, calcium, iron, phosphorus, potassium, and several vitamins—particularly B vitamins like thiamine, riboflavin, niacin, and folate—are all abundant in ragi.
- **High in Dietary Fiber:** Both soluble and insoluble dietary fibre may be found in abundance in ragi. In addition to assisting with digestion and promoting gut health and preventing constipation, fibre also helps control blood sugar and cholesterol levels.
- **Good Source of Protein:** Compared to other cereals, ragi has a greater protein level and offers vital amino acids like lysine, which are frequently

lacking in other grains. It is therefore an important source of protein, especially for vegans and vegetarians.

- **Gluten-Free:** Since ragi is inherently gluten-free, those who have celiac disease or gluten sensitivity can use this grain.
- **Rich in Calcium:** One of the finest nondairy ways to get calcium is via ragi. Raggi may assist in supplying the body with the calcium it needs, strengthening bones and lowering the risk of osteoporosis and other bone-related conditions.
- **Iron-Rich:** Iron is necessary for the synthesis of red blood cells and the avoidance of anaemia, and ragi is a great source of this mineral. Because ragi doesn't contain oxalates, it absorbs iron more easily than iron from plant-based sources like spinach.
- **Antioxidant Properties:** Antioxidants found in ragi, including as flavonoids and phenolic compounds, help prevent oxidative stress, neutralise free radicals, and lessen the risk of chronic illnesses like diabetes, cancer, and heart disease.
- **Low Glycemic Index:** Because ragi has a low glycemic index, blood sugar spikes are avoided because of its gradual release of glucose into the circulation. This makes it a fantastic option for folks who are attempting to control their blood sugar levels or who have diabetes.

#### Other Miscellaneous Uses

Ayurveda says that finger millet helps with weight loss, is a good option for vegans, calms the mind, lowers blood pressure, triglycerides, reverses the ageing of the skin, improves lactation, helps with child growth and weaning, encourages hair growth, is good for women, is a geriatric tonic, is gluten-free, reduces the risk of gallstones, and fights or prevents cancer.

#### Value Added Products of Ragi

Value-added ragi products provide creative ways to use this healthy grain to a variety of delectable dishes. Here are a few instances:

1. **Ragi Flour:** Ragi flour is a multipurpose ingredient that works well in many dishes, including cookies,

rotis, dosas, and idlis. Because of its rich fibre and mineral content, its nutty flavour gives classic meals a distinctive edge while also increasing their nutritious worth.

2. **Ragi Breakfast Cereals:** Breakfast cereals that are ready to eat can be made using ragi flakes or puffs. These items provide a quick and wholesome breakfast choice that is high in vital minerals, fibre, and protein.
3. **Ragi Snack Bars:** To make nutritious snack bars, ragi can be mixed with nuts, seeds, and dried fruits. These bars are perfect for on-the-go consumption since they give a powerful dose of nutrients, improve energy, and satisfy hunger needs.
4. **Ragi Pasta & Noodles:** Adding ragi flour to pasta and noodle recipes provides a gluten-free, distinctively flavorful substitute. Noodles and spaghetti made from ragi offer a gluten-free, tasty alternative for individuals on a gluten-reduction diet.
5. **Ragi Biscuits & Cookies:** Nutritious and tasty cookies and biscuits may be made with ragi flour. To add more taste and texture to these delights, you may add natural sweeteners like jaggery or honey, as well as components like nuts, seeds, and dried fruits.
6. **Drinks Made with Ragi:** Ragi may be blended to make shakes, smoothies, and malted drinks. Particularly ragi malt is a well-liked traditional beverage that is frequently used as a wholesome substitute for tea or coffee because of its reputation for increasing energy.
7. **Ragi Baby Food:** Because of its high nutritional value and ease of digestion, ragi is a great option for homemade baby food. As an additional food for babies, ragi porridge or puree can be offered, offering vital nutrients for developmentally sound growth.

#### Conclusion

In conclusion, ragi is a profitable crop with great potential to solve a variety of global concerns due to its nutritional and ecological advantages. Its ability to withstand unfavourable growing

circumstances, high nutritional value, and adaptability in the kitchen make it a viable and widely available food source for people all over the world. Additionally, as the value of varied diets and sustainable agriculture becomes more widely recognised, ragi production and consumption may be extremely important for enhancing food security, bolstering rural economies, and reducing environmental damage. Accepting ragi enhances our meals and helps ensure a better, more sustainable future for future generations.

**Table 2 :** A sample meal plan with “finger millet”-based preparations

S. No.	Meal	Finger Millets based product	Description
1.	Breakfast	Finger millet steamed cake	Fermented steamed cake prepared from finger millet and black gram dhal
2.	Lunch	Finger millet balls/ unleavened flat bread	Gelatinized stiff porridge made into balls with whole finger millet flour/finger millet flour based unleavened flat bread
3.	Evening Snacks	Finger millet crisps	Low fat extruded snack prepared from finger millet flour
4.	Dinner	Finger millet fermented pan cake	Fermented pancake made with ground batter of finger millet and black gram dhal

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