

RAGI (Finger millet): Nature's Amazing Gift to human race – Sustainable, Climate resilient, Nutritious and Delicious choice

Abstract: Ragi, scientifically known as *Eleusine coracana*, is an ancient and nutritionally dense cereal crop predominantly cultivated in tropical regions of Africa and Asia, notably in Ethiopia, India, and Sri Lanka. Commonly called "finger millet" in English, its name refers to the grain head's appearance, which resembles a hand with five finger-like spikes. A hardy plant, Ragi belongs to the grass family Gramineae, growing to heights of 1-2 meters with slender green leaves about 30 to 70 cm long. Ragi is a nutrient-dense, gluten-free grain rich in calcium, iron, fibre, and antioxidants, making it excellent for bone health, diabetes management, heart health, and weight control, while also being versatile for various culinary uses. Its low glycemic index and high fibre content promote digestive health and support modern dietary needs.

Prologue

India's three major millet crops—Jowar, Bajra, and Ragi stand out for their resilience and adaptability, thriving on less fertile soils and requiring minimal rainfall. Among these, Ragi (*Eleusine coracana*), or finger millet, holds a special place as an ancient, nutritionally rich cereal cultivated primarily in tropical regions of Africa and Asia, particularly Ethiopia, India, and Sri Lanka. Its name originates from the grain head's structure, which resembles fingers spread out like a hand. A hardy member of the grass family *Gramineae*, Ragi grows to heights of 1-2 meters, with slender green leaves and small, round seeds in shades of brown, red, or purple, arranged on straight or curved branches. Ragi's remarkable adaptability to a wide range of soils and climates makes it a versatile crop, flourishing in India's mountainous and plateau regions. Known as "Nachni" in Marathi, "Madua" in Bengali, and "Kezhvaragu" in Tamil, Ragi has been a staple in Indian agriculture for over 2,000 years. However, its prominence waned with the rise of rice and wheat. In recent years, Ragi has witnessed a resurgence, driven by growing awareness of its nutritional benefits and advocacy from global organizations like the UN FAO. This ancient grain is celebrated for its ability to aid digestion, manage diabetes, lower heart disease risks, and offer anti-aging benefits, solidifying its role as a superfood in modern diets. Aligning with India's efforts to promote millets as a solution to malnutrition and lifestyle diseases, ITC Foods launched the 'ITC Mission Millets' initiative. This program focuses on innovating millet-based products while empowering farmers with a decentralized seed system tailored to local needs. In Odisha, ITC has successfully demonstrated the potential of millet cultivation in improving farm productivity, profitability, and community engagement. Additionally, initiatives like introducing millet-based snacks in Malkangiri schools underscore the versatility and importance of these grains in combating malnutrition and enhancing overall health.

Brief Elucidation

Ragi, or finger millet, offers a remarkable nutritional profile with substantial health benefits, making it a valuable addition to daily diets. Here's a breakdown of its nutritional content, key health benefits, and therapeutic applications:

Nutritional Content

- **Macronutrients:** Ragi is rich in carbohydrates, fibres, fats, and proteins, with negligible cholesterol and sodium, supporting cardiovascular health.
- **Vitamins and Minerals:** High in vitamins C and E for immune, skin, and hair health, along with B vitamins like thiamine, riboflavin, niacin, and folic acid. It also contains calcium, magnesium, iron, and phosphorus, essential for bones and muscle function.

- **Amino Acids:** Ragi is a rare plant source of essential amino acids like isoleucine, tryptophan, valine, methionine, and threonine, making it ideal for vegetarian and vegan diets.

Ragi as Weaning Food

Traditionally, ragi porridge is a popular weaning food for babies, given its ease of digestion and nutrient density. It can be served alone or combined with other grains as "sathu," and sprouting the ragi adds even more nutritional value and aids digestion, making it an ideal semi-solid food for infants.

Health Benefits

Holistic Breakfast Food: With nutrients like vitamin C, E, iron, calcium, proteins, and fibre, ragi promotes digestion and nutrient absorption, especially when consumed for breakfast.

Essential Amino Acids: It contains methionine for skin and hair, valine and isoleucine for muscle repair, and threonine for dental health.

Supports Gluten-Free Diet: Naturally gluten-free, ragi is suitable for people with gluten intolerance or celiac disease, serving as a substitute for wheat-based foods.

Bone Density Fortification: High in calcium, it strengthens bones in children and helps maintain bone density in older adults, reducing osteoporosis risks.

Blood Sugar Management: The fiber, phytates, tannins, and polyphenols in ragi slow digestion, control blood sugar, and support weight management.

Treats Anaemia: Ragi's high iron content boosts hemoglobin levels, addressing iron deficiency anaemia.

Boosts Nervous System Function: Tryptophan in ragi aids brain function, mood regulation, and sleep quality by balancing serotonin levels.

Promotes Heart Health: With no cholesterol or sodium, ragi supports heart health by enhancing HDL levels and reducing LDL levels.

Supports Pregnancy and Lactation: Ragi's iron and calcium are beneficial for milk production and hormonal balance in pregnant and lactating women.

Child Nutrition: Ragi is a suitable weaning food for children, promoting healthy growth and development.

Eases IBS Symptoms: Its high fibre aids digestion, regularizes bowel movements, and may prevent colon cancer risks.

Therapeutic Applications in Ayurveda

Lowers High Blood Pressure: Ragi's fibers help clear blood vessels, reducing hypertension.

Supports Liver Health: Antioxidants in ragi assist in liver detoxification, supporting gallbladder health.

Reduces Depression: By regulating neurotransmitters, ragi promotes mental wellness, aiding in mood enhancement and alleviating depression symptoms.

Ragi's nutrient density, versatility in gluten-free diets, and broad health benefits make it a superfood well-suited for various dietary and therapeutic uses.

Ragi, beyond its internal health benefits, also contributes to skin and hair wellness due to its nutrient-rich profile, which includes essential amino acids and potent antioxidants.

Skin and Hair Benefits of Ragi

A prevent free radical damage. These antioxidants stimulate new skin cell growth, minimize fine lines and wrinkles, and boost collagen for smooth and youthful skin.

Anti-Aging: The seed coat of ragi contains phenolic acids and flavonoids, powerful antioxidants that

Exfoliation: With its slightly coarse texture, ragi flour works as a natural exfoliant, effectively removing dead skin cells from the face, body, and scalp to leave skin and hair feeling refreshed and glowing.

Hyperpigmentation Treatment: Ragi, when used as a mask with milk and honey, helps reduce suntan, UV damage, and uneven skin tone by tightening and rejuvenating the skin, resulting in a brighter complexion.

Acne and Blemish Reduction: Rich in tannins with anti-inflammatory properties, ragi reduces acne, pimples, and dark spots, helping achieve a clearer skin appearance.

Hair Fall Prevention: Amino acids like methionine and lysine in ragi help strengthen hair follicles and promote hair growth. Consuming ragi or applying it as a hair mask helps prevent hair fall, greying, and balding by nourishing the scalp and renewing hair texture.

Anti-Dandruff: Ragi's amino acids and carotenoids soothe and repair the scalp. Applied as a herbal paste, ragi reduces dandruff, relieves itchiness, and improves hair strength and vitality, ensuring a healthier scalp and hair.

Ragi Side Effects

While ragi is well-tolerated by most people and offers numerous health benefits, there are some considerations:

- **Kidney Health:** Individuals with kidney issues should limit or avoid ragi, as its high calcium content can raise oxalic acid levels, potentially leading to kidney and urinary bladder stones.

Conclusion

Ragi stands out as a versatile superfood packed with essential nutrients like fibre, protein, calcium, iron, and vitamins, and is naturally gluten-free, making it suitable for people with gluten sensitivities. However, moderation is key to avoid adverse effects, especially in those with kidney-related conditions.

With its high nutritional value, ragi can help prevent malnutrition and degenerative diseases like osteoporosis, arthritis, and Alzheimer's when consumed responsibly. Ragi can be enjoyed in various forms—sprouted seeds, flour for rotis, dosas, halwas, and porridges. With its multi-functional benefits, ragi serves not only as a nutritious food but also as a valuable ingredient in skincare and haircare routines.

Bibliography

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