



The Nutritional and Historical Significance of Millets Enhancing Health and Food Security

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INTRODUCTION

Millets, a diverse group of small-seeded cereal crops, have been essential to agriculture and nutrition globally. Serving as staples for over one-third of the world's population, particularly in Asia and Africa, millets rank as the sixth most produced cereal crop worldwide (FAO, 2019).

Key types include Sorghum (Jowar), Little Millet (Sama), Finger Millet (Ragi), Foxtail Millet (Korra), and Proso Millet (Variga). Each type has unique nutritional attributes: for instance, Bajra (Pearl Millet) and Little Millet are high in fat, while Finger Millet stands out for its low fat but high calcium content (Saleh *et al.*, 2013). Archaeological evidence indicates millet cultivation dates back to 3000-2000 BCE in China and India, underlining its historical significance (Weber and Fuller, 2008).

Historically, millets were preferred over wheat in Europe during the Middle Ages for their accessibility and nutrition. Today, major producers include China, India, Nigeria, and Niger, with India leading globally. Despite their importance, millets are often underutilized in developed nations where they are mostly used as animal feed (ICRISAT, 2012).

Nutritionally, millets surpass common cereals like rice and wheat, being rich in fiber, proteins, vitamins, and minerals, and having a low glycemic index beneficial for diabetes management (Gopalan *et al.*, 2012). They contain three to five times more iron, calcium, and phosphorus than rice and wheat, making them crucial for food security and nutrition. Additionally, millets are resilient, requiring less water and thriving in poor soil conditions, which supports food security in arid regions (Kaur *et al.*, 2014).

In India, Karnataka is the leading millet producer, but awareness about their nutritional benefits is limited (Reddy *et al.*, 2019). Despite contributing over 58% of global millet production, India's consumption is constrained by a lack of knowledge and promotion (Kole *et al.*, 2017). Increasing millet visibility could address health issues such as diabetes, cardiovascular diseases, and obesity (Singh and Raghuvanshi, 2012).

Millets

Traditionally, millets are grown with minimal pesticide use, naturally deterring pests. For instance, foxtail millet resists pests and reduces the need for chemical treatments when stored with pulses. Although less prominent than other feed crops in Indian agriculture, millets are vital for regional and farm-level food security due to their resilience in drought conditions.

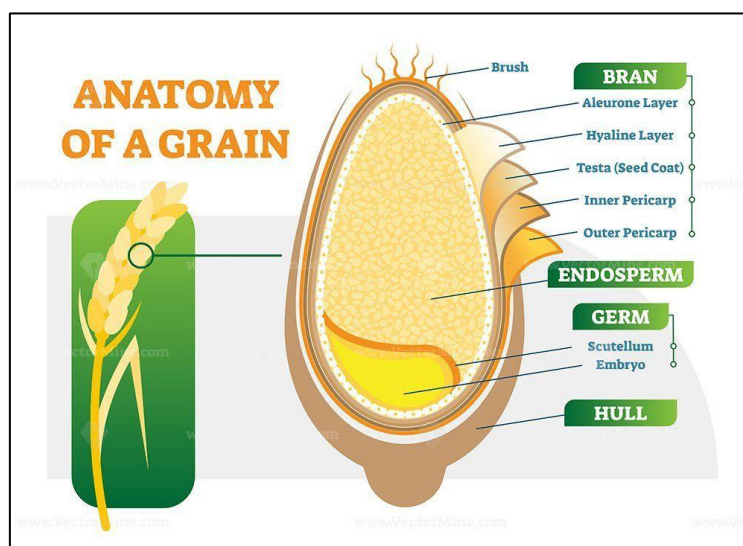
Millets are highly nutritious compared to staple grains. Finger Millet, for example, has calcium levels about 30 times higher than rice and foxtail and Little Millet offer significantly more iron than rice. The high content of essential micronutrients and antioxidants in millets supports health by combating malnutrition and obesity. They also benefit chronic conditions such as diabetes and cardiovascular diseases due

to their low glycemic index and high fiber content (Chandrasekara and Shahidi, 2010).

Components of a Grain Kernel

A millet grain comprises three primary components:

- **Bran:** The outer layer, rich in antioxidants, dietary fiber, and minerals like iron, zinc, and magnesium, known for its anti-inflammatory properties.
- **Germ:** Contains B vitamins, vitamin E, and unsaturated fats, crucial for the grain's nutritional value.
- **Endosperm:** The starchy core providing energy, proteins, and some vitamins and minerals.



Millets Nutritional Profile

Millets are composed of approximately 65% carbohydrates, 9% protein, 3% fat, and 2 to 7% crude fiber, along with a range of vitamins

and minerals. They are particularly rich in B vitamins, magnesium, antioxidants, and essential fatty acids like linoleic acid.

Table 1: Types of Millets and Their Benefits

Types of millets	Health benefits
Sorghum	Gluten-free and high in calcium, iron, and fiber, beneficial for those with celiac disease and reducing cholesterol
Finger Millet	High in calcium and iron, aiding bone health and anemia treatment
Pearl Millet	Rich in magnesium, helps with respiratory issues and migraine prevention
Kodo Millet	Contains antioxidants and phytochemicals that prevent lifestyle diseases
Proso Millet	High in niacin, preventing pellagra and used as a recuperative food
Foxtail Millet	Benefits diabetes management with its steady glucose release
Little Millet	Rich in B-vitamins, calcium, iron, and potassium, aids in weight management and can be a rice substitute

CONCLUSION

The rising global health challenges emphasize the importance of integrating millets into daily diets. Replacing refined foods with millets can enhance health, manage chronic conditions, and address nutritional deficiencies. Millets offer numerous health benefits and have historical significance, yet their modern use is limited. Promoting millets in contemporary diets could significantly improve public health and nutrition.

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