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Millets: A Modest Grain with Significant Health

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Millets, which are small-seeded grasses primarily grown in West Africa and East and South Asia, are becoming more and more acknowledged as a sustainable and nutrient-dense food source. The greatest producer in the world, India, grows a variety of millet varieties, such as finger millet, pearl millet, and sorghum, which are prized for their high nutritional content. Millets provide a number of health advantages since they are high in complex carbohydrates, protein, dietary fiber, B vitamins, antioxidants, and vital minerals like calcium and iron. These include better immunity, better digestion, weight control, and lower risks of heart disease, diabetes, and some types of cancer. Millets are perfect for anyone with celiac disease or gluten intolerance because they are gluten-free. Their significance in sustainable agriculture is further supported by their environmental advantages, which include pest resistance and water efficiency. Additionally, millets provide food security and offer financial advantages for small farms. Millets are a great complement to a balanced diet because they can help with detoxification, prevent degenerative illnesses, and enhance general health when consumed regularly.

As a wholesome, sustainable food, millet has become more and more well-known globally in recent years. For thousands of years, millets—small-seeded grasses—have been cultivated as cereal and fodder crops, particularly in East and South Asia and West Africa. During the monsoon season in India, millets are

mostly grown as rain-fed Kharif crops. With an annual production of 30.23 million tonnes, India is the world's largest producer of millets. The nation grows millet on 9.67 million hectares, with Rajasthan producing the most, followed by Gujarat(11%), Uttar Pradesh (20%), and Haryana(12%),Madhya Pradesh (9%), Maharashtra (5%), Karnataka (2%), and other states (2%). Millets are prized for their remarkable nutritional qualities and culinary adaptability.

Since millets are higher in nutrients than wheat and rice, they offer many health advantages. Their natural alkalinity makes them easy to digest, especially for kids. Millets are a strong source of protein, which is necessary for muscular growth, and are also rich in fatty acids, dietary fiber, B vitamins, antioxidants, and important minerals including calcium, iron, and magnesium. Millets are perfect for people with celiac disease or gluten sensitivity because they are gluten-free and have a low glycemic index.

Sorghum (jowar), pearl millet (bajra), finger millet (ragi), foxtail millet, proso millet (cheena), kodo millet, barnyard millet (sawa/sanwa/jhangora), small millet (kutki), and brown top millet are among the many varieties of millets that are often found in India. Every type has distinct nutritional advantages and is utilized in a variety of regionally specific culinary cuisines.

Nutrient Values Of Millets: Containing 60–70% dietary carbs, 6–19% protein, 1.5–5% fat, 12–20% dietary fiber, 2-4% minerals, and several phytochemicals, millets are a nutrient-dense food.

Health benefits of millets:- Strengthens Immune System and Aids in Body Detoxification: Consistent millet consumption strengthens immunity and aids in the body's general detoxification. Millets' antibacterial, anti-tumorigenic, and antioxidant qualities help ward off a number of illnesses, including as cancer and heart problems.

Controls Blood Sugar for Diabetes Management: Magnesium, which is found in millets, lowers the risk of type I and type II diabetes by enhancing insulin sensitivity. Millets are a great source of fiber and non-starchy polysaccharides, which are indigestible carbohydrates that aid un blood sugar regulation. Additionally, because of their low glycemic index (GI), these cereals are unlikely to cause blood sugar levels to rise. For those with diabetes, millets are therefore regarded as the best grain to eat.

Supports Heart Health: Millets improve cardiovascular health by lowering coronary artery obstruction. Because the fibers in millets are soluble, they create a viscous fluid in our stomachs, which may help decrease cholesterol. Consequently, this helps lower cholesterol levels by trapping lipids.

The Detoxifying Antioxidant Properties of Millets: Beneficial substances including quercetin, ellagic acid, and curcumin, which are abundant in millets, aid in the body's detoxification by encouraging the removal of toxins and preventing enzymatic activity. They have more than 50 phenolic compounds, including as flavonoids, phenolic acids, and other antioxidants that have the ability to reduce and chelate metals. Millets are valuable as natural antioxidant sources and functional dietary additives because of their substances.

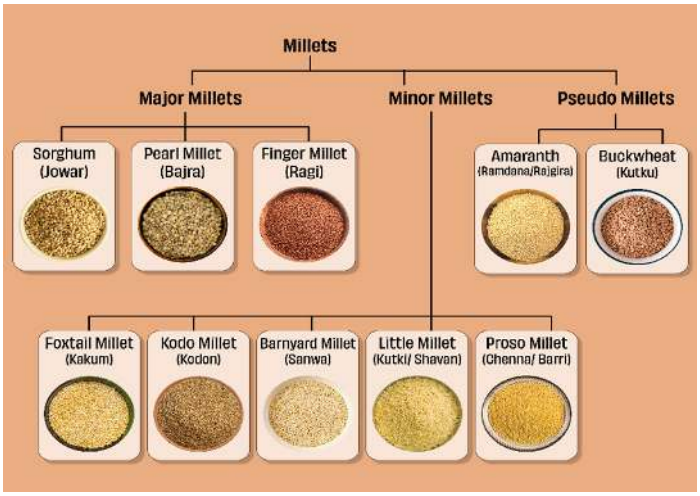
Nutritional Composition of Millets (per 100g)

Millets	CHO (g)	Protein (g)	Fat(g)	Energy (kcal)	Dietary Fibre (g)	Ca(mg)	Mg(g)	Z(mg)	Fe(mg)	Thaimin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (ug)
Sorghum	67.7	10.0	1.7	334.1	10.2	27.6	133.0	2.0	4.0	0.4	0.1	2.1	39.4
Pearl Millet	61.8	11.0	5.4	348.0	11.5	27.4	124.0	2.8	6.4	0.3	0.2	0.9	36.1
Finger millet	66.8	7.2	1.9	320.7	11.2	364.0	146.0	2.5	4.6	0.4	0.2	1.3	34.7
Kodo millet	66.2	8.9	2.6	331.7	6.4	15.3	122.0	1.7	2.3	0.3	0.2	1.5	39.5
Proso millet	70.4	12.5	1.1	341.1	-	14.0	153.0	1.4	0.8	0.4	0.3	4.5	-
Foxtail millet	60.1	12.3	4.3	331.0	-	31.0	81.0	2.4	2.8	0.6	0.1	3.2	15.0
Little Millet	65.6	10.1	3.9	346.3	7.7	16.1	91.4	1.8	1.3	0.3	0.1	1.3	36.2
Barnyard millet	65.6	6.2	2.2	307.1	-	20.0	82.0	3.0	5.0	0.3	0.1	4.2	-

Source- National Institute of Nutrition (2017)

Reduce Digestive Disorders and Assist in Digestion: Millets, being rich in phenolics and fiber, aid improve digestion and lessen digestive problems like cramping, bloating, constipation, and excessive gas. Consuming millets on a regular basis can also improve nutrient retention, enhance kidney and liver health, and reduce issues associated with gluten-rich diets, such as colon cancer and stomach ulcers.

Millets and the Prevention of Cancer: The antimutagenic and anti-carcinogenic qualities of millets are attributed to their phenolic acids, tannins, phytates, and dietary fiber. Consuming millet regularly can reduce the chance of developing cancers like colon, breast, and oesophageal cancer. According to studies, women who eat 30g of dietary fiber per day may have a 50% lower risk of developing breast cancer.



Types of Millets

Major Millets	
Sorghum(Jowar)	High in potassium, phosphorus, calcium, iron, zinc, sodium, thiamine, riboflavin, folic acid, carotene, fiber, and protein.
Pearl Millet(Bajra)	Comprises 4-6% fats and 12-16% protein. high (11.5%) in dietary fiber. High in calcium, unsaturated fats, and niacin.
Finger Millet(Ragi)	Highest calcium content (300–350 mg/100g). high concentration of minerals. includes fat (1.5–2%) and protein (6–8%). distinct amino acids. abundant in antioxidants.
Minor Millets	
Barnyard Millet(Sanwa)	Richest source of iron and crude fiber. includes useful components such as beta-glucan and GABA.
Proso Millet(Chenna)	Highest protein content (12.5%). Manganese from an inexpensive source as opposed to more traditional sources like nuts and spices. has a high calcium content.
Foxtail Millet(Kakum)	High in carbs. It has twice as much protein as rice. supplies iron and copper. Grain that is non-allergic and extremely digestible.
Kodo Millet(Kodon)	Very high fiber content (14.3%), low fat content (4.2%), and high protein content (11%). abundant in

	calcium, iron, potassium, magnesium, zinc, and B vitamins. is great for bolstering the neurological system and has a high lecithin content.
Little Millet(Kutki)	High concentration of iron. has approximately 38% dietary fiber. rich in antioxidant properties.
Pseudocereals	
Amaranth (Ramdana/Rajgira)	High in lysine and high in protein (13–14%). contains a higher percentage of oil (6–9%) than the majority of other grains. Rich in calcium, phosphorus, magnesium, iron, dietary fiber, and potassium.
Buckwheat(Kuttu)	Rich in lysine, it has 13–15% protein. The vitamins BI, C, and E are present. Both polyphenols and polyunsaturated essential fatty acids are abundant. More manganese, copper, and zinc are present than in other cereal grains with strong mineral bioavailability.

Source : FSSAI

Millets are extremely important due to their many applications and excellent nutritional value:

- Nutritional Value: Dietary fibre, vital vitamins, minerals, and antioxidants are all abundant in millets. They provide nutrients to any diet because they are a rich source of complex carbohydrate, protein and healthy fats.
- Regular consumption of millet has a number of health benefits. Due to their low calorie and glycaemic index, millets aid in weight management. They also improve digestion, boost immunity, control blood sugar, and support heart health. They also lower the risk of long-term illnesses like diabetes, obesity, and several types of cancer.
- Gluten-Free Substitute: Although millets are naturally gluten-free, they are perfect for people with celiac disease, gluten sensitivity, or those on a gluten-free diet. They are simple to use in place of wheat in pancake, cookie, and bread recipes.
- Culinary Uses: Adaptable to both sweet and Savory recipes, including smoothies, dosas, rotis, oatmeal, and pilaf.
- Environmental Sustainability: Encourages biodiversity and soil conservation, uses less water, and is resistant to pests.
- Economic Importance: Provides food security and revenue to small-scale farmers, particularly on marginal lands.
- Animal feed is nutritious for birds, cattle, and poultry and improves the quality of milk, eggs, and meat.
- Climate Change and Food Security Adaptation: Able to withstand severe weather conditions,

helping to provide food security in areas vulnerable to climate change.

Conclusion

Millets are important for human health since they provide a variety of health advantages and vital nutrients. We can control weight, lower the risk of chronic diseases, and promote cardiovascular health by including them in our diet. They are also appropriate for people with celiac disease or gluten intolerance because they are gluten-free. Adopting millets as a mainstay in your diet will greatly improve your general health and wellbeing. Promoting millet as a mainstream crop can help provide healthy, environmentally friendly food for the future. Millets are a sustainable solution to climate change, offering nutritional security, especially in arid and semi-arid regions. Rich in fiber, vitamins, and minerals, these nutrient-dense grains support digestion, bone health, and overall well-being. They are gluten-free and have a low glycemic index, making them ideal for people with gluten intolerance or managing blood sugar. Additionally, promoting millet as a mainstream crop can help provide healthy, environmentally friendly food for the future.

References:

1. Kumar, *et. al.* (2023). Importance of millets in human health, *Agri-Life: Healthy Millets, Mighty Millets*, *9*(IX), 18-19.
2. Kumar*, et. al.* (2023). Future of millets with reference to climate change in the Indian scenario: A brief overview, *Agri-Life: Healthy Millets, Mighty Millets*, *9*(IX), 22.
3. National Insitute of Nutrition(2017) https://www.nin.res.in/(2017)
4. Keerthana *et.al.(2023),*Unlocking the nutritional power:Exploring the impressive health benefits of millets, Agri-Life: Healthy Millets, Mighty Millets, 9(IX),15
5. Satyavathi, *et.al*.(2023), India's millet initiative: Global food for future – an overview, Food system for sustainability and profitability of millets,2(abstract book se liya refrence dena h?)
6. Sahu et.al.(2023), Millets as super foods for nutritional and health security, Agri-Life, Healthy millets: Mighty millets, Volume 9 (IX), Page no-3-4
7. Millet- The nutri cereal, Guidance note no. 12/2019, https://www.fssai.gov.in/upload/uploadfiles/files/Guidance_Notes_Version_2_Millets_29_01_2020.pdf