

MILLET'S CONSUMPTION: A WAY TO COMBAT MALNUTRITION

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ABSTRACT

FAO reported that the number of undernourished people worldwide is around 702- 828 million. The most common types of malnutrition in low-income and food-insecure nations cause anaemia, stunting, and wasting among malnourished people. The level of malnutrition and mortality among children is worrying. Millets are ancient heritage grains that have been cultivated without the use of pesticides on poor soils; as a result, they might be considered organic grains. Owing to their excellent nutritional value in micronutrient concentration, fibre content, resistant starch, gluten-free status and different phytochemicals with medicinal benefits, they are known as Nutri-cereal and miracle grain. The present study gives a way to cope with malnutrition in the insecure food situation.



INTRODUCTION

Higher production in agriculture is possible through advancements in science and technology made during the green revolution. Today, we have crossed self-sufficiency in food crops and come under the category of exporter countries. But after the green revolution, many changes occurred, like increased fertiliser and pesticide consumption and the promotion of certain crops, mainly focused on rice and wheat (Eliazer *et al.* 2019). All these factors are responsible for malnutrition, nutritional deficiency and disease sensitivity, and India's situation is very alarming for malnutrition status. In India, before the 60s, there was a tradition of eating and cultivating coarse cereals. Till 50 years ago, coarse cereals were grown in Central and South India.

According to an estimate, the share of coarse cereals in the total food grain production in the country was up to 40 per cent, which has come down to only 15 per cent today. India's per capita consumption of coarse cereals was 44.6 kg per year from 1951-55, which decreased drastically to 4.2 kg in 2010 (Kane-Potaka *et al.*, 2021). If we see at the percentage-wise consumption from the total food consumption in India, the proportion of coarse to total cereals consumed declined from 17 per cent to 3 per cent in urban areas and 35 per cent to 5 per cent in rural areas between 1961 and 2011.

Millets are commonly called coarse cereals due to their rough surface. Most of the millets come under the grass family. The name "millet" is derived from the word "mil" or "thousand", which refers to

the large number of grains produced from a single seed. However, the Hindi word "*Kadanan*" comes from the Sanskrit word "*Kadannam*", which refers to the food grains of the poor or "*Nindit Ann*", which means poor's man food. Based on the size of the grains, millets are divided into two a) Coarse cereals viz; sorghum and pearl millet and b) Small grains viz; ragi, foxtail millet, Kodo millet, Proso millet, barnyard millet and little millets, etc.

The nutritional quality of millets is higher than that of conventional food crops, and they contain more crude fibre, iron, zinc, phosphorous, calcium, antioxidants, and better protein quality (Bajra and ragi). The nutrient-enriched millets are useful for overcoming nutritional deficiencies in children and women.

MAJOR MILLETS

Table 1. Commonly cultivated millets, their common name, scientific name and local name

Sr.No.	Common name	Scientific name	Local name
1	Sorghum	<i>Sorghum vulgare</i>	Great Millet/Milo/Char/ jowar
2	Pearl millet	<i>Pennisetum typhoideum</i>	Bajra/ Sajje
3	Finger Millet	<i>Eleusine coracana(l)</i>	Mandua/ madua/Ragi
4	Barnyard Millet	<i>Echinochloa frumantacea</i>	Jhangora/ Shama/Samai
5	Proso millet	<i>Panicum miliaceum (l)</i>	Barri / Baragu
6	Foxtail millet	<i>Setaria italica</i>	Japanese barnyard millet
7	Kodo millet	<i>Paspalum scrobiculatum</i>	Kodra / Harka
8	little millet	<i>Panicum sumatrense</i>	Kutki Same
9	brown top millet	<i>Urochloa ramosa</i>	
Pseudo-millets			
1	Amaranths	<i>Amaranthus cruentus L</i>	Cholai
2	Buckwheat	<i>Fagopyrum esculentum</i>	Kuttu

BENEFITS OF MILLET CULTIVATION

Cultivation of millets is mainly done in areas where other traditional crops cannot be grown easily. Coarse cereals are often adapted to harsh environmental conditions such as the semi-arid tropics and therefore prove to be the backbone for dry farming. Millet crops generally mature rapidly, making them easier to adjust to more intensive cropping systems. Fast-maturing millets and other slow-maturing crops can be easily used as catch crops or relay crops. The cultivation of coarse cereals has many benefits, such as an amazing ability to bear various environmental stresses in the current climate change era, short crop period, low production cost due to minimum nutrient demand, disease resistance to fight pests, and less water. It can also be grown on less fertile land with a good yield.

Millets are C4 crops; hence, they are climate change compliant and can grow under water stress and high temperature. There are varieties, mainly in proso and little millet, which mature in 65-75 days; yet provide reasonable and assured harvests even under the most adversative conditions. Moreover, millets

sequester more carbon than cereals, decreasing greenhouse gas (GHGs). Millets cultivation supports farming in rain-fed conditions on which 60% of Indian farmers depend. They provide food and fodder and can be cultivated as mixed cropping with other crops like pulses and vegetables.

HEALTH BENEFITS OF MILLETS

Millets contain an abundance of phytochemicals and micronutrients in them. Hence, they are pronounced as "nutritional grains, miracle grains/wonder grains and Nutri-cereals", which is useful for overcoming nutritional deficiency in children and women. For example, ragi is a highly nutritious coarse grain of Indian origin. It is rich in calcium, containing 344 mg of calcium per 100 grams of ragi (Table-2). Ragi is said to be beneficial for diabetic patients. Similarly, millet is rich in protein which contains 11.6 grams of protein and 132 milligrams of carotene per 100 grams of millet, which is beneficial for our eyesight. Coarse grains have anti-diabetic and anti-hypertension properties, which are helpful in diseases like diabetes, high blood pressure and heart disease. Consumption of millet reduces triglycerides and C-reactive protein, which prevents heart disease. In addition, all coarse grain varieties have high antioxidant properties that boost the body's ability to fight infection.

Table:2 Nutrient Content of Various Millets in comparison to Rice and Wheat

Grain (Millet /Cereal)	Protein (g)	Fat (g)	Dietary fibre (g)	Ca (mg)	P (mg)	Mg (mg)	Zn (mg)	Fe (mg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Folic acid (ug)	Phenols (mg/100 g)
Sorghum	9.9	1.73	10.2	27.6	274	133	1.9	3.9	0.35	0.14	2.1	39.4	43.1
Pearl Millet	10.9	5.43	11.5	27.4	289	124	2.7	6.4	0.25	0.20	0.9	36.1	51.4
Finger millet	07.2	1.92	11.2	36.4	210	146	2.5	4.6	0,37	0.17	1.3	34,7	102
Kodo millet	08.9	2.55	06.4	15.3	101	122	1.6	2.3	0.29	0.20	1.5	39,5	368
Proso millet	12.5	1.10	-	14.0	206	153	1.4	0.8	0.41	0.28	4.5	-	-
Foxtail millet	12.3	4.30	-	31.0	188	81	2.4	2.8	0.59	0.11	3.2	15.0	106
Little millet	10.1	3.89	7.7	16.1	130	91	1.8	1.2	0.26	0.05	1.3	36.2	-
Barnyard millet	06.2	2.20	-	20.0	280	82	3.0	5.0	0.33	0.10	4.2	-	-
Wheat	10.6	1,47	11.2	39.4	315	125	2.8	3.9	0.46	0.15	2.7	30.1	20.5
Rice	07.9	0.52	02.8	07.5	96	19	1.2	0.6	0.05	0.05	1.7	9.32	2.51

Sources-Longvah *et al.* 2017

HOW CAN WE CONSUME MILLET OR ADD IT TO DAILY LIFE?

Millet has been named nutri-cereals and are now used either for fortifying existing products or developing novel food products. Traditionally, millet has been eaten long and is as old as civilisation. These can be consumed in the following ways:

1. *Bajra ka churma* is a traditional Rajasthani dish specially prepared in winter. That is prepared from coarse bajra flour by making roti. Then roast these rotis until they are crispy, grinding and making Bajra Churma ladoo by adding ghee, sugar and dry fruits.
2. *Rabodi ki sabzi* (dried papad)- is another traditional dish in western Rajasthan. Rabodi is made from buttermilk and bajra flour. Bajra flour is boiled in buttermilk, and after that, dried in sunlight, people make this rabodi and store it in air-tight containers. To cope with harsh climate conditions in Rajasthan, People make this rabodi and use it when there is a scarcity of vegetables to cook.
3. *Bajra ki kichadi* is famous in Haryana and Rajasthan also. It is a finely smashed Bajra porridge served with pure ghee.
4. *Babadi* is a Uttarakhand's traditional dish eaten in hilly regions and made from finger millet flour.
5. *Ragi mudde* is also known by different names like Ragi mudde, ragi sangati or kali, conversationally simply referred to as either mudde or hittu, i.e. 'flour'; is a meal in the state of Karnataka and the Rayalaseema region in Andhra Pradesh. It is mainly popular with the rural folk of Karnataka. In Tamil Nadu, especially in Western Tamil Nadu, it is called ragi kali
6. *Jowar's bhakhari* is famous in the Maharashtra region, and roti is prepared from sorghum flour.
7. *Jhangore (barnyard) ki kheer* is a delicious hilly dessert made using (barnyard millet), milk, and sugar and deliciously garnished with kewra essence, almonds and raisins.
8. *Millet Semolina*, the flour also known as Suji or Rawa. Millet Rawa Kesari, Ragi Suji and Bajra Suji are common.
9. Millet Flour uses to make various delicious products like idli, upma and dosa with cereals, pulses, and condiments. In addition, millets like ragi, pearl millet and sorghum are commonly used for making chapatis, and millet flour is recommended for people with diabetes.

Apart from the above, people may eat products prepared from millet which are available in the market in a ready-to-eat form, such as Millet namkeen, dosa, puff, bread, cookies, Ragi Vermicelli, pasta, Muffins (Ragi & Bajra), Alcoholic beverages and millet-based probiotic beverages.



CONCLUSION

Millets are ancient heritage grains that have been cultivated without the use of pesticides on poor soils; as a result, they might be considered organic grains. Owing to their excellent nutritional value in micronutrient concentration, fibre content, resistant starch, gluten-free status and different phytochemicals with medicinal benefits, they are known as Nutri-cereal and miracle grain. Therefore, there is a need to promote the cultivation of millets and adoption in the dietary pattern of a large population to combat malnutrition.

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