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Celebrating Millets - As Nutricereals for Food, Nutrition & Health

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Abstract
Millets are sometimes referred to as "Smart Food" since they are simple to grow, largely organic, and full of nutrients. Millets are a long-term alternative for reversing climate change and developing agri-food systems that are climate resilient. Millets are grown without the use of chemical fertilisers and draw fewer bugs. Better profitability is consequently produced by decreased cultivation costs and improved productivity. The majority of the body's essential supplements are provided by millets, which also keep one healthy. Millets also give farmers financial security.

Introduction
The International Year of Millet offers a fantastic opportunity to increase millet's contribution to food security, increase millet production globally, ensure efficient millet processing, transport, storage, and consumption, expand acceptance of millet's value-added product throughout the country and the world, and raise awareness of millet's benefits among the general public. While intakes of vitamin A (22.8%) and riboflavin (50%) were appallingly insufficient, average intakes of calories (83.2%), protein (89.8%), and micronutrients including iron (77.6%) and niacin (61.3%) were found to be below the recommended dietary requirement (National Nutrition Monitoring Bureau, 2017). The government now promotes millets, which are thought of as a nutritional powerhouse, as "Nutri Cereals. "Additionally, millets have more methionine and sulphate amino acids than refined wheat and milled rice.

Why we are Celebrating 2023 as International year of Millets?
IYM 2023 will lead India towards Food and Nutritional Security. Millets are considered „Smart Food" as they are easy to cultivate, mostly organic and contains high nutritional value. The IYM 2023 celebration is an opportunity for India to promote Nutri-cereal Millets globally and place them in the world's 'food map' with PM Modi"s vision of "Vasudaiva Kutumbakam" (The World is One Family) and to make IYM 2023 a „People"s Movement" alongside positioning India as the „Global Hub for Millets".

Across the globe we are entering into a new paradigm shift associated with our diet patterns, climate change as well as in the terms of new trading trends of millets. We are celebrating Year 2023 as the comeback of millets again to our farm and plates with the aim to create awareness, increase production & consumption of millets. Raising awareness to create „Millet Mindfulness" is an essence of this celebration

IYM 2023 will provide us with a unique opportunity to give visibility to crops that have great potential to strengthen global nutrition, food security, decent jobs & economies, while accelerating climate action. Millets are basically Asian crops, climate resilient, lead to sustainable development and help ensure Food Security & Nutrition for all.

Classification of millets

Major Millets	Minor Millets	Pseudo Millets
Sorghum	Foxtail millet	Amaranth
Pearl Millet	Kodo millets	Buckwheat
Finger Millet	Barnyard millet	
	Little millet	
	Proso millet	

Pearl Millet: Bajra- Pearl Millet is a super food it helps in reducing cholesterol, high sugar levels, aids in weight loss, relieves constipation, prevents insomnia, best plant-based protein source, high in antioxidants, treats iron deficiency anaemia.

Finger Millet: Ragi- Finger millet is full of dietary fiber, which helps to control the "bad" cholesterol that can contribute to heart diseases like atherosclerosis. Soluble fiber absorbs cholesterol before it enters your bloodstream, maintaining a lower cholesterol level.

Foxtail Millet:Kakun- Foxtail Millet is rich in Vitamin B12 which is essential for maintaining a healthy heart, smooth functioning of the nervous system, and in general good for skin and hair growth. Foxtail Millet may improve glycemic control and reduce insulin, cholesterol.

Figure 1: different types of millets

Sorghum: Jowar- Gluten-free, rich in fiber, great food for diabetics, source of protein, packed with essential minerals, promotes the health of bones, lose weight, preserves the health of digestive system, source of proteins, rich in antioxidants, and more sustainable than other grains.

Kodo Millet: Kodo- Being naturally rich in fiber, millets also help to reduce problems like constipation, flatulence, bloating and stomach cramping. Millets are a good source of magnesium which is known to be promoting heart health. It helps to reduce blood pressure.
Proso Millet- Proso millet has multiple benefits when consumed as human food. Proso millet is rich in minerals, dietary fiber, polyphenols, vitamins and proteins. It is gluten-free and therefore, ideal for the gluten intolerant people. Proso millet contains high lecithin which supports the neural health system.
Barnyard Millet- Low in calories, rich in dietary fiber, low glycemic index, gluten free grain, good source of iron.
Little Millet- Little millet is rich in Magnesium which helps improve heart health. It is also rich in Niacin which helps lower cholesterol. Little millet contains phosphorus which is great for weight loss, tissue repair and energy production after strenuous workout. It also helps detoxify the body.
Buck wheat- Boosts heart health, improves digestion, helps in weight management, lowers blood sugar level.
Amaranthus- Amaranth is rich in antioxidants, including gallic acid and vanillic acid. Antioxidants help fight free radicals, which are damaging by products of normal cellular activity, helping to reduce everything from signs of aging to heart disease.

Table 1: Nutrient content of millets per 100 g (Gopalan *et al.*, 1989)

Grain/Nutrient	Pearl millet	Sorghum	Finger millet	Foxtail millet	Proso millet	Barnyard millet	Kodo millet
Energy	361	349	328	331	341	397	309
Protein (g)	11.6	10.4	7.3	12.3	7.7	6.2	8.3
Fat (g)	5.0	1.9	1.3	4.3	4.7	2.2	1.4
Calcium (mg)	42.0	25.0	344	31.0	17.0	20.0	27.0
Iron (mg)	8.0	4.1	3.9	2.8	9.3	5.0	0.5
Zinc (mg)	3.1	1.6	2.3	2.4	3.7	3.0	0.7
Thiamin (mg)	0.33	0.37	0.42	0.59	0.21	0.33	0.33
Riboflavin (mg)	0.25	0.13	0.19	0.11	0.01	0.10	0.09
Folic acid (mg)	45.5	20	18.3	15.0	9.0	-	23.1
Fibre (g)	1.2	1.6	3.6	8.0	7.6	9.8	9.0

Table 1: Nutrient content of millets

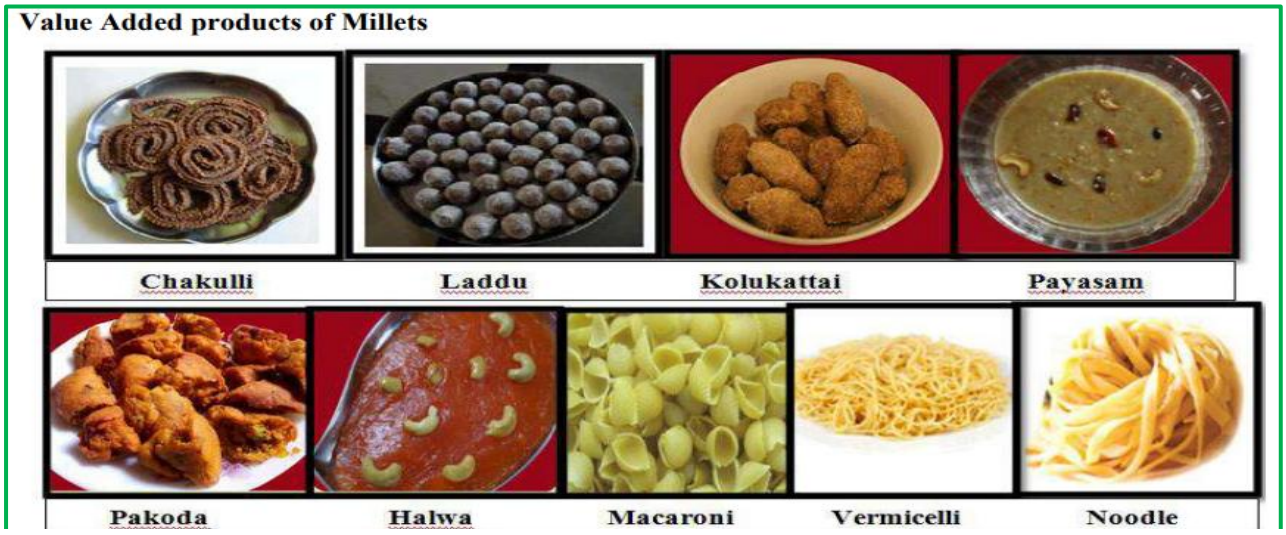

Figure 2: Value addition in millets

Health Benefits of Millets

Millets are also known as nutri-cereal as they are very high in their nutrition content. Compared to rice, they have 30 to 300% more nutritional elements such as Calcium, Minerals, Iron, Fibre, Beta Carotine and many other micronutrients. Millets are rich in B vitamins, calcium, iron, potassium, magnesium, zinc, they are gluten-free and has low-GI (Glycemic index) thus millets are suitable for people allergies/intolerance of wheat. Diabetic persons and people suffering from weight gain can also opt for millets. The phenolic properties found in millets compromise phenolic acids, flavonoids, and tannins, which are beneficial to human health.

Millets have potential health benefits and epidemiological studies have showed that consumption of millets reduces risk of heart disease, protects from diabetes, improves digestive system, lowers the risk of cancer, detoxifies the body, increases immunity in respiratory health, increases energy levels and improves muscular and neural systems and are protective against several degenerative diseases such as metabolic syndrome and Parkinson‟s disease. The important nutrients present in millets include resistant starch, oligosaccharides, lipids, antioxidants such as phenolic acids, avenanthramides, flavonoids, lignans and phytosterols which are believed to be responsible for many health benefits.

Specific health benefits of millets

1. Millets are the health-promoting nutritious crops. As compared to other cereals they have superior micronutrient profile and bioactive flavonoids.
2. Millets are the best food sources to reduce issues with obesity. Millets contain very high quantities of dietary fibre and intake of high dietary fibre results in hunger satisfaction and increases satiety decreases the incidence of obesity.
3. Anemia is one of the most prevelant health problems in Indian context. Millets are the good sources of natural iron. Consumption of millets can bringdown the anemia in human beings.
4. Regaular consumption of millets will help in keeping malnutrition, degenerative diseases, liver disorders and asthama under control.
5. People suffering from allergic reactions can rely on millets. Pearl millet has a very low probability of causing allergic reactions due to the hypo-allergic property.
6. Millets have a role to play in reduction of oxidative stress. The phenolic compounds present in the millets removes the free radicals thus reducing the oxidative stress.
7. 7.It is proved that millets also have anticancer properties. The millet extracts have antiprolific effects on cancer cell line, inhibit DNA damage and induce the production of phase-2 detoxifying enzymes.
8. 8.Millets have capacity to prevent the oxidation of low-density lipoproteins reducing lipase activity which reduces the occurrence of hypertension.
9. 9.Millets contain various minerals and are the good source of minerals like iron, zinc, and calcium.
10. 10.Millets are gluten-free and can be consumed by celiac disease patients.
11. 11.Millets are found to be helpful with the reduction of weight and body mass index (BMI).

Conclusion

The short harvest season and low water requirement of millet make it a good crop for dry climate. They could act as a wholesome substitute for wheat and rice as a new main course. It might help safeguard the food security of a substantial population in the next years. Given that India is the world's top producer of millet, there is potential for India to end world hunger. The Indian government has put in place a variety of measures to boost millet farming practises and provide a favourable environment for farmers.