

MILLET AS A SUPERFOOD

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Abstract:

*Millets belongs to the group of small-seeded grass of the family Poaceae. Popularly they known as Nutri-cereals, Smart foods, Super foods or Food of the 21st century. These millets have ability to grow and adapt in adverse climatic conditions and soil quality. However, these crops were long lost and neglected in order to develop popular cereals crops like rice and wheat. Rice and wheat were consumed by people on a regular basis which led to an increase in various types of health issues. Due to the challenges of the 21st century recently like climate change, over-exploitation of agricultural lands, shortage of water and increased food cost the world is facing nutritional insecurity and there is an urgent need to switch towards dry land farming as the best crops suited under such condition are millets. In recent years, there has been a growing interest in millets. So many scientist they work on millets and they know what the importance of millets is. And also they have quoted that millets is nutritious and healthy food which can be consume without harming the environment .The use of millets is increasing now, more and more research is going on about how exactly millet can be beneficial for health. These superfood have been thoroughly researched so that they can be included in a regular daily diet. The reasons why the demand for millet has surpassed the major cereals are because of their nutritive value, gluten free nature and many health benefits. In order to increase the production of nutrient-rich millets and create awareness among people the year 2023 is declared the “**International Year of Millets**”. Because of the unique characteristics of millets, their advantageous applications and customer concern for their health, food scientists and researchers have created a variety of value-added products which have high market value as people believe that millet-based products are of great benefit to the health of children’s as well as adults. Need of the World is Millets as a Superfood. So called Marvelous Millets.*

Key Words : *Millets, Superfood, Sorghum, Climatic condition, Health issues.*



Introduction :

In recent years, there has been a growing interest in millets. So many scientist they work on millets and they know what the importance of millets is. And also they have quoted that millets is nutritious and healthy food which can be consume without harming the environment .The use of millets is increasing now, more and more research is going on about how exactly millet can be beneficial for health. These superfood have been thoroughly researched so that they can be included in a regular daily diet. Millets are rich in protein and can help to overcome malnutrition. Millets can also meet the nutritional needs of pregnant and lactating mothers, children's and the elderly with other micro and macronutrient deficiency characters. Millets are rich in nutritional potential and contains many bioactive phytochemicals including phenolic compounds such as ferox lignins, insulin resistance, starch, ferulic acid, caffeic acid .Polyphenols present in millets have been shown to have many benefits.

Because these ingredients acts as an antioxidant, it has anti-inflammatory and anti-viral properties ,and millets have also been shown to have neuroprotective effects against lifestyle-related diseases such as cardiovascular diseases, diabetes, high blood pressure, high cholesterol, and metabolic diseases these antioxidant helps to fight with diseases.

Millet is classified as a superfood for all the amazing nutritional benefits it hosts, According to the Food and Agriculture Organization of the United Nations Millets has been cultivated in our country for centuries, and India is the highest producer of millet worldwide today.

We all know millets by their local names like Jowar(sorghum), Ragi (Finger millet) Bajra (Pearl millet) , Kangani (Foxtail millet) but you should also know that these household staples are powerhouses of nutrition that have a variety of health benefits especially for growing children. These are gluten free and full of nutrients such as magnesium, potassium, calcium, manganese, tryptophan, Phosphorus, Vitamin B and antioxidants.

Recently a study has been done by National Centre for Biotechnology Information found that the cognitive ability of Indian school going children was positively impacted by consistently eating fortified pearl millet, worldwide the most common deficiency is the iron deficiency it limits the child's brain development and learning capacity .So the benefits of millets can solve these problems.

Ragi porridge is a first food for babies in some parts of South India and also it is enjoyed breakfast by the adults. It is added to our children's diet because it improves their performance in school, by providing them with exactly the right nutrients they need to keep their little bodies and brains healthy and growing.

Types of Millets and their benefits for growing kids :

There are 13 types of millets available globally which include pearl millet, finger millet, sorghum, little millet, proso millet, kodo millet, barnyard millet, brown top millet, foxtail

millet, Guinea millet, Job's tears, fonio, and teff. Except for Job's tears, fonio, and teff, the other millets are widely distributed in India. Finger millet is widely found in India, China and in some Eastern and Southern African countries, whereas fonio is widely distributed in Western Africa and Job's tears in northeast India, southern and eastern Asia and southern China. On the other hand, teff is mainly found in Ethiopia. But here I will quote only some of them.

1) Ragi(Finger Millet)- Good for development of brain and fights Anemia :

Ragi is best substitute for rice, and easily cooked in porridge, finger millet /Ragi is full of calcium, protein and amino acids. It is very popular and first food for babies and it is rich in iron too. This makes ragi a very important part of your child's diet as this is gluten free millet which contains all the nutrients needed for development of brain in your child and it keeps away anemia, a common problem in school going kids, which leads to low attention spans and poor energy levels.

2) Jowar (Sorghum)- Helps to control Obesity :

Different types of roti's has been made with the help of jowar for ages in our country, It is full of protein, iron and fiber, and helps keeps the bad cholesterol away. We live in times when childhood obesity is a real concern, and millet is the perfect food for the kids who have been advised to switch to healthier diets. This is also gluten free, and it is meant for those children's who are born with whet allergies.

3) Kangni/ Korra (Foxtail millet)- Builds Immunity :

Foxtail millet (Setaria italica): It is also known as Italian millet, has been cultivated since ages and is widely revered for its nutritional value and medicinal properties (Prashant et al., 2005) [62]. Traditionally it is being used to treat dyspnea, food stagnancy and as emollient, astringent and stomachic. It contains 12.3% and 3.3% protein and minerals respectively. It shows strong ability to tolerate abiotic stresses and hence is one of the least affected crop due to climate change other desirable agronomic aspects include high water use efficiency and yield stability. Once foxtail millet was more valued crop than wheat and rice.



Table 1- Millets and their special characters –

SR. NO.	MILLETS	SPECIAL CHARACTERS
1.	Barnyard Millet	Fastest growing, voluminous feeder (Gupta et al.,)
2.	Proso Millet	Tolerant to heat and draught, also fast growing (Sahib, 1997)
3.	Finger Millet	Wider Adaptability (Seetha ram, 1998)
4.	Foxtail Millet	Tolerant to heat and draught, also fast growing (Jijau, 1989)
5.	Kodo Millet	Can be well grown in shallow and deep soil (Hegde and Gowda, 1989)
6.	Little Millet	Can withstand both draught and waterlogging (Doggett, 1989)

Millets (including sorghum) are known to be highly nutritious besides having a low carbon footprint and the ability to survive in high temperatures with minimal water. Millets are widely recognized as having a low Glycemic Index (GI) helping to manage diabetes. This systematic review and Meta-analyzes across the different types of millets and different forms of processing/cooking collated all evidences. In reducing dietary GI than the control samples. Millets with intermediate GI are pearl millet, finger millet, kodo millet, little millet, and sorghum which have a 13–35% lower GI than the control with high GI (>69). A meta-analysis also showed that all millets had significantly ($p < 0.01$) lower GI than white rice, refined wheat, standard glucose or white wheat bread except little millet which had inconsistent data. Long term millet consumption lowered fasting and post-prandial blood glucose levels significantly ($p < 0.01$) by 12 and 15%, respectively, in diabetic subjects. There was a significant reduction in HbA1c level (from 6.65 ± 0.4 to $5.67 \pm 0.4\%$) among pre-diabetic individuals ($p < 0.01$) who consumed millets for a long period. Minimally processed millets were 30% more effective in lowering GI of a meal compared to milled rice and refined wheat. In conclusion, millets can be beneficial in managing and reducing the risk of developing diabetes and could therefore be used to design appropriate meals for diabetic and pre-diabetic subjects as well as for non-diabetic people for a preventive approach.

It is estimated that there will be a 51% surge in diabetics globally by 2045, from 463 million in 2019 to 700 million in 2045 with type 2 diabetes accounting for about 90% of the total. Eighty-seven percent of diabetes-related deaths occur in low and middle income countries where there is less diversification of staple foods. It is important to note that apart from a sedentary lifestyle and obesity, the type of food consumed plays a key role in diabetes. Main staples such as refined rice, refined wheat and maize contribute up to 80% of the energy intake in developing countries. Diversifying food staples and mainstreaming traditional nutritious and less glucogenic staples in the majority of developing countries is very important to manage and

prevent diabetes. Millets and sorghum figure first in this list of staples.

Advantages of growing millets over other crops are:

1. They can be grown in harsh environmental situations.
2. They need very less inputs, hence the initial cost of
3. Growing them is less.
4. Millets can be grown as a fodder crop as well
5. They are a store house of nutrients and proteins
6. They do not emit carbon-di-oxide like rice crop
7. Water requirement in case of millet is very less
8. They are good source of iron, zinc and calcium
9. They are dual source crops, can be used as feed as well as fodder when required
10. Very less maintenance is required for these crops. The farmer can focus on other avenues as well side by side while he grows millets
11. After harvesting, millets can be well stored for up to two years without any harm
12. Millets are rewarding crop. They have a potential to give a generous amount of return
13. when sold at the proper time
14. Millets have deep root system compared to other field crops. They can extract water
15. from the deepest layers of the soil profile effectively
16. Cultivation of millets also reduces the carbon footprint on the earth
17. Millets when consumed with cereals or pulses, creates mutual supplementation of
18. Proteins hence, increasing its total digestibility
19. 15. Millet based products are easy and quick to prepare. These products are getting
20. popularity at the local markets now a days.

Conclusion :

Millet, a coarse cereal seed and side crop cultivated by farmers, is still neglected. Its greatest application in the human diet has been a subject of study for decades, but it has yet to reach communities or industry. Undoubtedly, the green revolution favored a boon for the country and gave much-needed agricultural, financial, and research attention to wheat and rice, but production of other minor crops including millets was declined. Millets are mostly used as animal feed or as a side cereal in the absence of wheat and rice, therefore the Medicinal potential of seed components like protein has largely gone untapped. The majority of the customers were unaware of the nutritional, environmental, and economic benefits of Millets. Millet protein could be a low-cost alternative plant-based protein source to presently available animal protein supplements. Several studies have shown prominent health effects of consuming millet protein suggesting potential applications in medicinal products and therapeutic diet. Millets are easy to grow, can tolerate adverse climatic conditions, have different health benefits and therefore can be a good alternative of rice-wheat."

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