

Role of Millets in Diet Diversification

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Abstract:

Millet attract no pest so they are termed as pest-free crops, storage pest do not affect them. They are best for agricultural environment. The are much better then rice and wheat. Their nutrient content is for better than rice and wheat. There nutrition content is for better than rice and wheat. It provides us micronutrient such as beta carotene in abundant quantities. Today our world is facing climate crisis like a increase in climate temprature, Drough, tmalnutrition. Only millet have answer and only millet can meet these challenge.

Some chemical elements like, phenolic acid, tannins are found in millets which reduces the risk of cancer. They have high fiber content and they are rich in micronutritions by using it is the form of different types of dishes. We can avoid different types of diseases and improve quality of our life. We can use it in baked products, infantmix and many more with the use of millet we can diversify our diet and can overcome many challenges like malnutrition and climate change etc.

Keywords

Millets, Millets Recipe, Diet Diversification

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Introduction:

According to tripathi et al (2023):- The word “Millet” is dervied from the Latinword “Milum” which means cereals. Millets is grown as a staple grain not only in india but also in other countries.

It is also know as a “Coarse cereals” or poor people cereals. It is mainly cultivated in developing countries but its ability to grow in harsh environmental condition make it ideal crop for many countries. Their agricultural importance arises from their toughness, for bearance to extreme weather conditions and these grain could be grown in low rainfall areas. It has been found that millets are very beneficial for human health.Besides this italso increases the life span.

Jaybhaye et al (2014) : - Many species of millets are grown in India such as *Bajra, Jowar, Ragi, Kakum, Kodon, Sanwa, Chenna/Barri, Kutki/Shavan etc.* pearl millet, sorghum and finger millet create the largest share of India’s total production of millets.

History of Millets

There is no exact information about its origin. It is believed that millets was a crop that originated spontaneously from different regions of the world. In ancient age people in Indian and other parts of the world used millets as their main food and stayed healthy and strong. These are small in size and are found in different shapes and sizes in different colours. Mittets are believed to be one of the most ancient food.

Based on the evidence it has been found both bajra and maize were produced in north China. (Deng et al. 2017). At the same time they were cultivated in Africa, Middle East and Europe. Evidence of their production has been found in Africa, Middle East and Europe. Evidence of the production of maize and *bajra* has been found yajurveda in BronzeAge 4500 BC in india. Barnyard millet (*aarava*) and finger millet was very common in indianbronze age.It is considered as staple food in rural Indian, for its production, the Indian Deccan plateau is found to be most suitable according to the environment. Tripti et at (2023). Far to the Northeast in China (Zhao 2005) they used it in variety of dishes eg- porridge, dumpling, noodles etc. They were also used as a medicine in Chinese culture.

Millet began to be grown in Europe in Bronze age about 3-5 thousand year ago. They used it in a making of bread and beer.

Nutritional composition of various types of Millets

Indian have celebrated the year 2018 as the year of millets, The year 2023 has been declared as ‘International year of millets by FAO. Millets are mainly

famous as coarse grains in India. Coarse grain mainly contain iron, magnesium and selenium. Selenium has antioxidant properties. They have all the Important nutrients essential for human health. They are rich in dietary fibres and they are good source of macro nutrients, such as protein, micronutrients and phyto chemicals. They contain 7-12% protein, 2-5% fat and 67-75% protein. Their digestibility is also very good. Small millets are good source of iron and phosphorus. All millets have high antioxidant properties.

1. Sorghum (*Jowar*)- Sorghum is a rich source of protein. Its protein is known as prolamin. The nutritional composition of sorghum varies according to its variety. Generally proteins, Carbohydrates and lipids are mainly found in *Jowar*. It is used as a staple food in Asia and Africa. Traditionally it is used to make cookies, biscuits, bread, noodles, tea, beer etc. Many people also use it as an animal feed. It keeps the blood glucose and lipid level low which helps in preventing cardiovascular diseases and it keeps the gut microflora balanced.
2. Bajra- It has high protein and lipids. It is rich in fiber which is good for gut health. Niacin content is rich in Bajra. It also has folic acid, magnesium, iron, copper, zinc and vitamin E and B- complex. It has a high fiber content which is very beneficial for those who want to lose weight. Patients suffering from heart disease and diabetes also benefit from its use.
3. Ragi.- Ragi is the oldest millet of India. Among all cereals ragi contains the highest amount of Calcium. Its protein and fat contents are low. Antioxidant activity of this millet is high. Sadhukhan et al (2023).
4. Foxtail millet (*Kakum*)- It has high carbohydrate and protein content. It is most digestible and non-allergic grain and has a sweet nutty flavor. Copper and iron is rich in it.
5. Kodo millets- It has high protein and very high fiber content. It is very beneficial for patients with gluten intolerance as gluten is not found in the Kodo millets. Due to the presence of lecithin in the Kodo millet it is easy to digest which is very good for the nervous system. It is also very useful for suffering from heart disease, asthma and postmenstrual syndrome. Its lecithin content is high which is good for nervous system.
6. Barnyard millet (*Sanwa*)- It has high protein content which is found between 11 to 13%. and Carbohydrate about 65%. It contains GABA which reduces the level of lipid and glucose in blood. Products for diabetes patients are made from it. It is cultivated in Madhya Pradesh, Uttar Pradesh, Andhra Pradesh Karnataka, Maharashtra and Bihar.

7. Little millet (*Kutki*)- It is small in size, contain 38% of dietary fiber and has high iron content and has high antioxidant activities.
8. Proso millet (*chenna/Barri*)- It has highest amount of protein (12.5%) and has large amount of carbohydrate and fatty acids. It contains high amount of calcium which is good for bone health and it is good for people who have heart related diseases.
9. Amaranth (*Ramdana*)- It has high protein content (13-14%) it has 77% unsaturated fatty acids and high linoleic acid. It is rich in dietary fibre which has cholesterol lowering & cancer preventive properties.
10. Buckheat (*Kuttu*)- It is rich in protein, minerals, carbohydrate, Vit B, C and E, rich in PUFA and linoleic acid.

Traditional millets Recipes

1. Pearl millet (*Bajra*)- It include kambankoozh, (an old-time porridge). It is a healthy and refreshing drink use in hot summer from Tamil Nadu H.Khan. et al (2023)
Bhakkri roti is often used in state of Gujrat, Maharashtra, Rajasthan and Karnataka in India.
2. Finger Millet (*Ragi*)- Ragi mudde, ragi sangati, means 'lump' or 'dough'. Finger millet contain more calcium and potassium than other millet Varieties. The availability of minerals also increases after germination and fermentation. The availability of nutrients like iron after germination is very useful for health of the teenagers and children. It contain antioxidant, antibacterial and anti fungal properties. It has the property of reducing cholesterol in the body and healing the disease. By using it as papad, chips, noodles, pasta, bread, cake, cookies, sweet, laddu, Idli, etc can be made. It is nutritious and very easy to digest and used as a weaning food.
3. Foxtail Millet or Navane- It has high carbohydrate, protein and minerals content. It is thought that perhaps the oldest cultivated millet originated in Northern China. According to H.H. Khan et al (2023). Idli, Upma, payasam, biryani are some common recipes of this millet. In parts of northern china they used it in a form of porridge.
4. Little Millet, (*Samai or Kutki*)- These crops are grown across India. It is used as rice and have high iron content. Some traditional little millet recipes are pulau, payasam, khichadi, biryani etc. It is grown throughout India mainly in M.P., Orissa, Jharkhand and U.P. According to Prabhakar et al (2017)
5. Sorghum (*Jawar/Jola*)- Maharashtra, Madhya Pradesh, Tamil nadu, Rajasthan, & Andra Pradesh are also major producer of them. It is mainly used in rotis

and porridge.

6. Barnyard Millet- Barnyard Millet have highest fibre and iron content amongst fellow millet and have good amount of B- complex vitamin. It has low amount of Carbohydrates and contains good amount of protein and iron. It is highly beneficial for people having sedentary lifestyle. Traditional recipes of barnyard millet are porridges, samvatke chawal (popular in navratras), Upma, Khichdi and Pulav.
7. Proso Millet (*Baragu*)- It traditional recipes are Upma, briyani and porridge. It is mainly grown in Tamil Nadu, Karnataka, Andra Pradesh and Utrakhand.
8. Kodo Millet (*Araka*)- It is excellent for our nervous system because it has high amount of lecithin. It is also rich in Nacin/B6 and folicacid. Its calcium iron, potassium, magnesium and Zinc content is also good. It is largely grown in M.P. Chattisgarh, Maharashtra, Tamil Nadu and Karnataka.

Millet porridge is considered as a traditional food in Russia, German and Chinese cuisines. Millets are used in traditional cuisines in various states of India. Millets have been used as a staple food in Africa and Asia since ancient times. Phytochemicals are found in it. These have Therapeutic properties.

Role of Millets in Diet Diversification-

Through various epidemiological studies can say that millets have the power to protect our body from different nutritional disorder. Its nature is alkaline and it maintain our body Ph balance and prevent different disease. Millet reduce the chance of diabetes, millets is a rich source of phenolic acid, tannins and phytate. It also reduce the risk of colon and breast cancer. Those who do not want to include gluten in their diet, Millets is the best option for them Millets is very high in its fibre content so it is good for constipation, to control flatulence bloating and other gastrointestinal disorders.

Utilization of Millets-

Traditional Millets	State	Recipes
1. Pearl Millet/Bajra	Tamil Nadu Maharashtra, Gujrat Karnataka, Andra Pradesh	KambanKoozh, Bhakri roti Sangati, Ambal
2. Finger Millet/Ragi	Karnataka	Ragi Mudde
3. Foxtail, Millet/Navane	Northern Parts of China	Porridge Idli, Upma, Paysam, Biryani
4. Little Millet, Samai or Kutki	India	Pulau, Paysam, Khichadi, Biryani

5. Sorghum or Jowar/Jola	India	Roti & Porridge
6. Barnyard Millet	India	Sanvatke Chawal Umpa, Khichadi, Pulav
7. Proso Millet or Baragu/ Varagu	China, India	Upma, Venpongal
8. Kodo Millet/ Araka	China, India, Nepal, Phillippines	Dosa, Itli, Pulau

Source : Khan H.H. et al (2023) Sadhu Khan et al (2023)

We can use millets in a form of Roti, Dosi, Baked products such as biscuits, cookies and cakes. In brewing industry and we can use them as a dehydrated food products such as papads.

Conclusion

Some of the processing technologies like dehulling, germination, popping/puffing, flaking, malting, baking, fermentation etc. can increase its utilization and they add value to the food product. Mechanical dehulling improves the quality of flour and rawa. We can use them in a baked foods products, snack items, Ready to mixes, Dehydrated food products, Infantu mixes, ready to eat items, rotimixes, puffing and malting contributing for dietary diversification. We can also use in brewing industry.

In this way it can be concluded that millets have capacity to meet the chalanges like malnutrition, climate change & water crisis, pest attack etc. These crops are an sustainable blessing to us and our farmers.

References

1. MILLETS: The Future food/Indian Science. Technology & Innovation: ISTI Portal. Indiascience.andtechnology.gov.in
2. Indian Millets (apeda.gov.in)
3. <https://apeda.gov.in/milletportal/production.html>
4. Vijaya Khader and V Vimala. “Income Generating Viable Technologies for women” Department of Foods and Nutrition, P.G. Research centre, Acharya N.G. Ranga Agricultural University, Hyderabad (1999)
5. Khan H.H. Tomar Amit Mishra A.K. etal (April 2023) Millets of India and Traditional Millets Recipes” Just AGRICULTURE Multidisciplinary e-newsletter, www.justagriculture.in
6. Jaybhave R.V. Pardeshi I.L., Vengaiiah P.C., Srivastav P.P. “ Processing and Technology for Millet Based Food Products” Journal of Ready to eat Food, www.jakraya.com/journal/jref

7. <https://www.milletstats.com>
8. Raajeswari P.A., ‘FOIFS25 Recipes with cereals and millets’ Food and Nutrition eppathshala egg.inflibnet.ac.in
9. Food safety & standards (Food products Standard and Food Additives), Regulations 2011
10. Quick test for some adulterant in Food: instruction manual part II (method for detection of adulterants)
11. Indian institute of millet research millet network of india- deccan developed society- FIAN, India.
12. Nutritional and health benefits of millets, ICAR Indian Institute of millets research (IIMR)
13. Grain and legumes nutrition council
14. Millets- the nutria-cereals guidance Note no 12/2
15. Prabhakar, Ganiger PC, Boraiah B, Bhat sujata, Tippeswamy V. Manjunath H.A. (2017) “Improved production technology for Little millet” project coordinating unit ICAR-AICRP in small millets GKVKm Bengaluru-5600655
16. Khader Vijaya (V016, 1 Jan. 2022) millets for dietary diversification ACTA SCIENTIFIC NUTRITIONAL HEALTH (ISSN:2582-1423)
17. Talabi Abideni, Vikram Prashant, Thushar Sumitha Rahman Hifzur, Ahmadzai Hayatullah, Nhamo Nhamo, Shahid Mohammed, Singh R.Kumar, (2022) “Orphan Crops: A Best Fit for Dietary Enrichment and diversification in Highly Deteriorated Marginal Environments” frontiers Vol 13-2022/ <https://doi.org/10.3389/fpls.839704>
18. Sarkar Preetam, DH Lohith, Dhumal Chanda, Panigrahi S Shubham, Choudhary Rupal “Traditional and ayurvedic foods of Indian origin (2015) 97-109/ <https://doi.org/10.1016/j.jef.2015.01.03>
19. Tripathi Tripti, Vyas Sweta “From ancient grains to modern Solutions” A history of millets and their significance in agriculture and food security” International Journal of Home Science 2023; 9(2):72-78/[www/homesciencejournal.com](http://www.homesciencejournal.com)
20. Sadhukhan Aishik, Debaogshi Udit “Millets in Meeting the Nutrition Security: Areview” (2023) Institute of Agriculture, Visv a- Bharti, Sriniketan, Wst Bengal (731236), India Vol. 31 www.justagriculture.in.
21. <https://www.agmrc.org>proso-millet>
22. <https://www.icrisat.org>.

23. Xiong, YunyZhag, Pangzheng Warner R., D., Fang, Zhongxiang (2019) Sorghum Grains From Genotype, Nutrition, and Phenolic Profile to its Health Benefits and Food Applications. *Comprehensive Reviews in Food Science and Food Safety*. Vol18, 2025-2046. doi: 10.1111/1541-4337.12506.
24. Stefoska - Needham, A. (2024) Sorghum and health: An overview of potential protective health effects. *J Food Sci*. Feb 26; 89 (Suppl 1): A30-A41. doi: 10.1111/1750-3841-16978. Epub 2024 Feb 26. PMID: 38407549; PMCID: PMC11641550
25. Balkrishna, A., Shankar, R., prajapati U.B., Srivastava, A., Joshi R.A., Tripathi, P., (2014). A review Bajra/Pearl millet (*Cenchrus americanus* (L.) Morrone) *Journal of scientific and Innovative Research*. 13(1), 1-8. doi: 10.31254/jsir. 2024.13101
26. Shobana, S., Krishnaswamy K., Sudha V., Malleshi, N.G, Anjana, R.M, palaniappan, L., Mohan, V., (2013). Finger Millet(Ragi, *Eleusine coracana* L.). A Review of Its Nutritional properties, Processing, and Plausible. Health Benefits. *Advances in Food and Nutrition Research*. Vol 69, 1-32. DOI:10.1016/B978-0-12-410540-9.00 001-6. Source: PubMe
27. Bunkar, S. D., Goyal, S.K; Meena, K.K., Kamalvanshi, V., (2021). Nutritional, Functional Role of Kodo Millet and its” processing: A Review. *International Journal of Current Microbiology and Applied Sciences*, 10 (01), 19721985. <https://doi.org/10.20546/ijcmas.2021. 1001-229>.
28. Renganathan, V.G, Vanniarajan, C., Karthikeyan, A., Ramalingam, J., (2020). Barnyard Millet for Food and Nutritional Security : Current Status and Future Research Direction. *Front Genet*. 2020 Jun 23; 11:500. doi: 10.3389/fgene. 2020.00500.
29. Sawant, Dhairyashil, P., Tavhare, Dilip, S., (2023). A review on the use and scope of finger millet (Ragi) in prevention and management of non-Communicable diseases. *Journal of Drug Research in Ayurvedic Sciences*. 8 (Suppl),S55-S63. DOI: 10.4103/jdras. jdras_126_23
30. Jacob, J., Krishnan, V., Antony, C., Bhavyasri, M., Aruna, C., Mishra, k.,Nepolean, T., Satyavathi, C.T., Visarada, K.B.R.S, The nutrition and therapeutic potential of millets : an update narrative review. (2024). *Frontiers in Nutrition* doi: 10.3389/frut. 2024. 1346869.PMCID: PMC11091339, PMID: 38746941
31. Dayakar, Rao. B., Srinu. M., Vijaya Lakshmi, K., Kiranmai, E., Vilas. A.Tonapi, (2021) *Millet Recipes, A Healthy choice*, ICAR-Indian Institute of Millets Research, Rajendranagar, Hyderabad, pp180, www.millets.res.in.