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ROLE OF MILLETS IN CONTEMPORARY LIFESTYLE

Jay Prakash Gupta*, Akanksha Soni[1], Govind Sahay Shukla[2], Rajaram Agarwal[3], Manisha Goyal[4] and Vijay Pal Tyagi[5]

*Assistant Professor Department of Rasashastra & Bhaishajya Kalpana, Shri Baba Mastnath Ayurvedic College, Asthal Bohar, Rohtak-124021, Haryana, India.

[1]BAMS MA(Sanskrit), Practitioner, Phalodi- 342301, Rajasthan, India.

[2]Professor and HOD, Post Graduate Department of Rasashastra & Bhaishajya Kalpana, PGIA, Jodhpur-342037, Rajasthan, India.

[3,4]Asso. Professor, Post Graduate Department of Rasashastra & Bhaishajya Kalpana, PGIA, Jodhpur-342037, Rajasthan, India.

[5]Asst. Professor, Post Graduate Department of Rasashastra & Bhaishajya Kalpana, PGIA, Jodhpur-342037, Rajasthan, India.

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***Corresponding Author**
Jay Prakash Gupta
Assistant Professor
Department of Rasashastra & Bhaishajya Kalpana, Shri Baba Mastnath Ayurvedic College, Asthal Bohar, Rohtak-124021, Haryana, India.

ABSTRACT

Millets are a group of small-seeded grasses that have been cultivated for thousands of Years. They are highly nutritious and versatile, with a range of culinary uses. In recent Years, millets have gained popularity in contemporary lifestyle due to their health benefits, sustainability, and versatility in cooking. Millets are rich in fiber, protein, and micronutrients, and are gluten-free, making them a great option for those with dietary restrictions. Millets are also an environmentally friendly crop, requiring less water and fertilizer than other grains. As such, they have the potential to be a sustainable solution to food insecurity in many regions of the world.

KEYWORDS: Millets, Nutrition, Health, Food, Benefits, Contemporary, Lifestyle.

INTRODUCTION

Millets have been a staple food in India and other parts of Asia for thousands of years. They are small-seeded, diverse group of grasses that have been grown in a range of environmental conditions. Despite being overshadowed by more popular grains like rice and wheat, millets

have sustained many communities with their nutritional value, low cost, and resilience to harsh environmental conditions.[1,2] In recent years, there has been a renewed interest in millets, not only as a traditional food source but also as a sustainable and nutritious option in contemporary lifestyles.[3]

This review article aims to provide a comprehensive overview of the usage of millets in contemporary lifestyles in the Indian and Asian context, with a focus on their nutritional value, health benefits, and potential for sustainable agriculture.[4] The article will begin by discussing the history and diversity of millets, as well as their cultural significance and culinary applications in India and other parts of Asia.[5] It will then delve into the scientific evidence on the nutritional properties of millets, including their macro and micronutrient content, as well as the potential health benefits of consuming millets.[6] Finally, the article will examine the role of millets in promoting sustainable agriculture and food systems in India and other parts of Asia and provide recommendations for future research and policy interventions.

Millets: History, Diversity, And Cultural Significance

Millets have been grown and consumed in India and other parts of Asia for thousands of years. In India, millets have been a staple food for many communities, especially in the arid and semi-arid regions, where they are grown as rainfed crops.[7] Millets like Finger millet (*Eleusine coracana*), Pearl millet (*Pennisetum glaucum*), Sorghum (*Sorghum bicolor*), and Foxtail millet (*Setaria italica*) have played a significant cultural role in many societies, with some communities using them in religious rituals or as part of their traditional cuisine.[8]

In other parts of Asia, millets have also been an important source of food and fodder for both humans and livestock. Millets like Proso millet (*Panicum miliaceum*), Japanese millet (*Echinochloa esculenta*), and Barnyard millet (*Echinochloa frumentacea*) have been cultivated in different parts of Asia for centuries. In China, for instance, millets have been grown for more than 10,000 years, and are still an important crop in many parts of the country.[9]

Millets are also an integral part of the traditional cuisine of many communities in India and other parts of Asia. In India, millets are used to make a range of dishes, including rotis, porridges, and snacks. Finger millet is a popular ingredient in many southern Indian dishes, such as dosas and idlis. In China, millets are used to make various types of congees, a type of

rice porridge, as well as noodles and cakes.[9] In Japan, millets are used in the production of sake, a traditional rice wine, as well as in the preparation of various types of noodles and cakes.[10]

Types of Millets

There are several different types of millets that are commonly grown and consumed in India and Asia, each with its own unique nutritional profile and culinary uses. Some of the most grown types of millets in India and Asia include.

Table I: Millets common and scientific names with their special characters.[11]

Sr. No.	Millets	Scientific name	Vernacular names	Special characteristics
1.	Sorghum	*Sorghum bicolor*	*Jowar, jowari*, durra, great millet	Known as camel of dryland
2.	Pearl millet	*Pennisetum glaucum*	*Bajra, sajje, kambu, kambam, sajjalu*	Highly tolerant to drought, heat, and soil salinity
3.	Finger millet	*Eleusine coracana*	*Ragi, mandua, kapai, marua, nagli*	Wider adoptability, rich source of calcium
4.	Proso millet	*Panicum milacium*	*Cheena, baragu, panivaragu*	Short duration tolerant to heat and drought
5.	Foxtail millet	*Setaria italica*	*Navane, kauni, kangni, korra, rala*	Short duration, tolerant to low soil fertility and drought
6.	Little millet	*Panicum sumatrense*	*Same, samai, samulu, kutki*	Short duration, withstand both drought and waterlogging
7.	Barnyard millet	*Echino chloacolona*	*Sawan, oodalu, jhingora*	Fastest growing and voluminous fodder
8.	Kodo millet	*Paspalums corbiculatum*	*Kodo, varagu, haraka, arikalu*	Long duration, grown well in shallow and deep soil
9.	Teff grass	*Eragro stistef*	Williums Love grass, *teffa*	Ethopian staple food, high market price
10.	Quinoa	*Chinopodium quinoa*	*Inca wheat goosefoot, pigweed*	Nutritionally rich
11.	Fonio millet	*Digita riaexilis*	*Findi/fundi*, white fonio, acha rice, hungry rice	Long panicles, erect habit, long stem, strong and resistant to lodging
12.	Browntop millet	*Brachiaria ramose*	*Baragu*	Nutri rich

Source: IIMR, 2020

Nutritional Value

Millets are known for their high nutritional value, particularly in terms of their macro and micronutrient content. Millets are a rich source of dietary fiber, protein, vitamins, and

minerals, and are also low in fat and gluten-free. The nutrient composition of millets varies depending on the type of millet, as well as the soil, climate, and other environmental factors.

Macronutrients Composition

Millets are a good source of dietary fiber, which plays an important role in maintaining digestive health, regulating blood sugar levels, and reducing the risk of chronic diseases like diabetes, heart disease, and cancer. Millets are also a good source of complex carbohydrates, which provide sustained energy and prevent blood sugar spikes. In addition, millets are low in fat and high in protein, which makes them a good option for vegetarians and vegans.

Micronutrient Composition

Millets are also a good source of micronutrients like vitamins and minerals. The micronutrient composition of millets varies depending on the type of millet, as well as the soil, climate, and other environmental factors. Iron and zinc are two important micronutrients that are often deficient in the diets of people.[12]

According to the Indian Institute of Millets Research (IIMR), the nutrient composition of some commonly consumed millets is as follows.

Table II: Nutrient content of millets[11] (per 100 g).

Crop/nutrient	Protein (g)	Fiber (g)	Minerals (g)	Iron (mg)	Calcium (mg)
Sorghum	10	4	1.6	2.6	54
Pearl millet	10.6	1.3	2.3	16.9	38
Finger millet	7.3	3.6	2.7	3.9	344
Foxtail millet	12.3	8	3.3	2.8	31
Proso millet	12.5	2.2	1.9	0.8	14
Kodo millet	8.3	9	2.6	0.5	27
Little millet	7.7	7.6	1.5	9.3	17
Barnyard millet	11.2	10.1	4.4	15.2	11
Browntop millet	11.5	12.5	4.2	0.65	0.01
Quinoa	14.1	7	-	4.6	47
Teff	13	8	0.85	7.6	180
Fonio	11	11.3	5.31	84.8	18
Rice	6.8	0.2	0.6	0.7	10
Wheat	11.8	1.2	1.5	5.3	41

Source: IIMR, 2020

Health Benefits of Millets

Millets have been traditionally consumed in India and other parts of Asia for thousands of years and have recently gained renewed interest due to their health benefits. Research has

shown that regular consumption of millets can have several positive effects on human health, ranging from improved digestive health to reduced risk of chronic diseases. This section will discuss some of the key health benefits of millets, based on the available scientific evidence.

1. Digestive Health: The high dietary fiber content of millets can help to promote digestive health by preventing constipation, reducing the risk of diverticulitis, and regulating bowel movements. In addition, millets contain prebiotics, which are a type of dietary fiber that promotes the growth of beneficial gut bacteria. This can improve the overall health of the digestive system and reduce the risk of digestive disorders.[13,14,15]
2. Weight Management: Millets are low in fat and high in dietary fiber, which makes them an ideal food for weight management. The high fiber content of millets can help to promote satiety, which can reduce the overall calorie intake and prevent overeating. In addition, the slow-release carbohydrates in millets provide sustained energy, which can reduce the urge to snack between meals.[16,17]
3. Reduced Risk of Chronic Disease: Research has shown that regular consumption of millets can reduce the risk of chronic diseases like diabetes, heart disease, and cancer. Millets have a low glycaemic index, which means that they release glucose into the bloodstream slowly, preventing spikes in blood sugar levels. This can help to regulate blood sugar levels and reduce the risk of diabetes. Millets are also a good source of antioxidants, which can help to reduce the risk of oxidative stress and inflammation, two key factors in the development of chronic diseases.[18,19,20,21,22]
4. Improved Bone Health: Millets are a good source of micronutrients like calcium, phosphorus, and magnesium, which are important for bone health. Regular consumption of millets can help to improve bone density and reduce the risk of osteoporosis and other bone-related disorders.[23]
5. Improved Heart Health: The high dietary fiber content of millets can help to reduce cholesterol levels in the blood, which is a key risk factor for heart disease. Millets are also a good source of potassium, which can help to regulate blood pressure and reduce the risk of hypertension.[24,25]
6. Reduced risk of Cancer: Research has shown that the antioxidants found in millets can help to reduce the risk of cancer by protecting cells from oxidative damage. In addition, the dietary fiber in millets can help to promote regular bowel movements, which can reduce the risk of colon cancer.[26]

Overall, the consumption of millets can have several positive effects on human health and can be an important component of a healthy and balanced diet. However, it is important to note that millets should not be considered a cure for any specific disease and should be consumed as part of a healthy and balanced diet.[27,28,29]

Economic Importance

Millets are an important crop in India, especially in the semi-arid regions of the country. According to the Ministry of Agriculture and Farmers' Welfare, millets are grown on an estimated 17 million hectares of land, with an annual production of around 13 million tons. The major millet-producing states in India include Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, and Tamil Nadu.

Millets are an important crop for smallholder farmers in India, as they require minimal inputs and can be grown with low-cost, traditional farming practices. Millets are also highly resilient to climate change, making them an ideal crop for dryland areas that are prone to drought and other extreme weather events. Millets have the potential to provide smallholder farmers with a reliable source of income, and to contribute to their food and nutritional security.[30]

Millets are an important crop that has the potential to improve food security, livelihoods, agricultural sustainability, and economic growth in India and Asia.

Food Security: Millets are an important source of food for millions of people in India and Asia, especially in rural areas. They are highly nutritious and have a high protein, fiber, and mineral content. Millets can be grown in a variety of soil types, require less water than other crops, and are highly resistant to pests and diseases. This makes them an ideal crop for small-scale farmers, who can grow them even in marginal lands. Millets are also highly versatile and can be used in a variety of dishes, from porridges and bread to cakes and pastries.[31]

Livelihoods: The cultivation and processing of millets also provide an important source of livelihood for many small-scale farmers and rural communities in India and Asia. Millets are a hardy crop that requires minimal inputs and can be grown in areas with poor soil quality and low rainfall. This makes them an ideal crop for small-scale farmers, who may not have access to irrigation facilities or expensive fertilizers. In addition, millets can be easily stored for long periods, making them an important source of income for farmers during periods of food scarcity or low agricultural productivity.[32,33]

Agricultural Sustainability: Millets are an important component of sustainable agricultural practices in India and Asia. They require less water and are more resilient to pests and diseases compared to other crops. This reduces the need for expensive inputs, such as fertilizers and pesticides, and helps to reduce the carbon footprint of agriculture. In addition, the cultivation of millets can also help to improve soil fertility and prevent soil erosion, which is a major concern in many parts of India and Asia.[34]

Economic Growth: The cultivation and processing of millets can also provide a significant boost to the economy of India and Asia. Millets are an important export commodity, with India being the largest exporter of millets in the world. The export of millets has the potential to generate significant income for farmers and rural communities, while also promoting economic growth in these regions. In addition, the cultivation of millets can also lead to the creation of small-scale industries, such as millet processing units, which can provide employment opportunities for local communities.[35,36,37]

Government Policies on Millets

In India, the National Food Security Mission (NFSM) has identified millets as a priority crop. The mission aims to increase the production of millets by providing financial assistance to farmers and promoting the use of modern technologies. Under the NFSM, the government has established Millet Mission, which aims to promote the cultivation of millets and increase their availability in the market.[38]

The government has also introduced various schemes to promote the consumption of millets. The Integrated Child Development Services (ICDS) scheme provides millets as a part of the supplementary nutrition to pregnant women and children under the age of six.[39] The Mid-Day Meal scheme, which provides free meals to school children, includes millets in the menu.[40] The Public Distribution System (PDS) provides millets at subsidized rates to people below the poverty line.[41]

Government of India has proposed to United Nations for declaring 2023 as International Year of Millets (IYOM). The proposal of India was supported by 72 countries and United Nations General Assembly (UNGA) declared 2023 as international year of Millets on 5th March 2021. Now, GOI has decided to celebrate IYOM, 2023 to make it people`s movement so that the Indian millets recipes, value added products are accepted globally.[42]

In addition to these schemes, the government has also taken steps to promote the marketing and processing of millets. The Small Farmers Agri-Business Consortium (SFAC) provides financial assistance to farmers for setting up millet processing units. The National Institute of Nutrition (NIN) has been promoting the use of millets in the food industry by developing millet-based food products.[43

DISCUSSION

In recent years, there has been a growing interest in the consumption of millets in India, especially in urban areas. This has been driven by a combination of factors, including the increasing prevalence of lifestyle diseases, rising awareness of the nutritional value of millets, and the promotion of millets by the government and non-governmental organizations.[44]

One of the key drivers of the contemporary approach to millets in India is the growing concern over lifestyle diseases such as diabetes, heart disease, and obesity. Millets have been shown to have a low glycaemic index, which means that they release sugar into the bloodstream slowly, leading to a lower risk of diabetes and other lifestyle diseases. This has led to a growing interest in millets among health-conscious consumers in India.[29]

Another factor driving the contemporary approach to millets in India is the increasing awareness of the nutritional value of millets. Millets are a rich source of vitamins, minerals, and dietary fiber, making them an ideal food for people of all ages. They are also gluten-free, making them a good alternative for people with gluten allergies.

The promotion of millets by the government and non-governmental organizations has also played a significant role in the contemporary approach to millets in India. The government has launched several initiatives to promote the cultivation and consumption of millets, including the Millet Mission, which aims to increase the production of millets, and the promotion of millets in government-run schemes such as the public Distribution System and the Mid-Day Meal Scheme.[40]

Non-governmental organizations have also played a significant role in promoting the consumption of millets in India. For example, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has been working with farmers to promote the cultivation of millets and develop millet-based value-added products.[45,46] The Millet Network of India

(MINI) is another organization that has been working to promote the cultivation and consumption of millets in India.[47,48]

Organic millet cultivation has several advantages. It promotes soil health and biodiversity, reduces water usage, and products healthier and more nutritious grains. The demand for organic millets is also increasing, both in India and globally.[49,50] Organic millets command a higher price in the market, which provides an economic incentive for farmers to switch to organic farming.

One of the major contemporary approaches to promoting millets in India is using modern technologies.[51] Millet production has traditionally been done using traditional methods, which are time-consuming and labour-intensive. However, with the advent of modern technologies, millet cultivation has become more efficient and profitable.[52] Modern technologies such as precision farming, drip irrigation, and mechanization have helped to increase the yield and quality of millets.[53]

Another approach to promoting millets in India is through the development of millet-based products.[54] The food industry has recognized the potential of millets and has been developing a range of millet-based products such as millet flakes, bread, biscuits, and noodles. These products are being marketed as healthy alternatives to traditional processed foods.[55]

While there has been a growing interest in the consumption of millets in India, there are several challenges that need to be addressed to promote the widespread adoption of millets as a staple food.

One of the biggest challenges is the lack of awareness of millets among consumers. Many people are not familiar with the different varieties of millets and are not sure how to incorporate them into their diets. This can be addressed by educating consumers about the nutritional value of millets and providing them with information on how to cook and use millets in their meals.

Another challenge is the lack of infrastructure for the cultivation and processing of millets. Millets require specialized equipment for processing, and many farmers do not have access to this equipment. This can be addressed by providing farmers with training on millet processing and by establishing processing units in rural areas.[56,57]

CONCLUSION

Millets have been an integral part of the Indian diet for centuries. They are a rich source of nutrients, minerals, and dietary fiber, making them a healthier alternative to rice and wheat. The benefits of millets extend beyond their nutritional value. They are also a cost-effective, environmentally sustainable crop that is drought-resistant and can thrive in poor soil conditions. Their inclusion in contemporary lifestyles can improve the health and well-being of individuals, while also promoting environmental sustainability and economic growth. The Indian government has recognized the potential of millets and has launched various initiatives to promote their consumption. There is a need for greater awareness and education about the benefits of millets and their inclusion in modern diets.

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