JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

MILLETS: IN MODERN WORLD FOR HEALTH AND WELLNESS

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Abstract

Millets, the forgotten grains of our food system which has a bunch of health benefits, offering an array of vitamins, minerals, and fibres. It is good old nutritional powerhouse. Not only are they gluten-free, but they are also easier to digest, making them a great alternative for those with digestive issues. So, to improve our health or make a positive impact on the planet, including millets into our diet is a step in the right direction. There are variety of millets like pearl millet, fox millet, finger millet etc which adds different benefits to our health and improve various health issues. In March 2021 - the UN General Assembly declared 2023 as the 'International Year of Millets' (IYM 2023), a campaign that will be a chance to spread knowledge about millets' health and nutritional advantages.

Keywords -Millets, Gluten-free, Glycaemic index, Finger millet, Kodo millet, Pearl millet, Sorghum millet, Foxtail millet, Porso millet, Anti-nutritional factor.

Introduction

The evolving landscape of health and nutrition has witnessed a remarkable resurgence of ancient grains, positioning them as nutritional powerhouses in the contemporary quest for holistic well-being. Among these nutritional gems, millets, encompassing a diverse array of varieties such as pearl millet, finger millet, sorghum, and foxtail millet, stand out as exceptional sources of sustenance and wellness.

Rekindling Interest in Nutritional Diversity

In recent years, as society grapples with lifestyle diseases and an escalating demand for nutritious alternatives, millets have emerged from obscurity to claim a pivotal role in the discourse of dietary wellness. Once overshadowed by mainstream cereals like wheat and rice, these resilient grains are now reclaiming their significance, heralding a nutritional renaissance rooted in their exceptional health attributes.

Rediscovering Millets

Nutritional Foundations Millets, members of the Poaceae family, offer a nutritional bounty that has captivated health enthusiasts and nutritionists alike. Their innate nutritional richness, marked by high fiber content, essential B complex vitamins, minerals encompassing iron, calcium, magnesium, phosphorus, antioxidants, and indispensable amino acids, endows them with remarkable dietary value. Furthermore, their gluten-free nature renders them an invaluable dietary option, catering to individuals navigating gluten sensitivities, thereby widening their appeal in modern dietary practices.

Millets: An Overview

Millets, categorized under the Poaceae family, represent a diverse group of ancient grains known for their resilience and adaptability to various climatic conditions. The nutritional foundation of millets serves as the bedrock for understanding their potential health impacts in contemporary dietary practices.

Nutritional Composition

Millets boast an exceptional nutritional profile, offering a wealth of essential nutrients crucial for human health. They are abundant sources of dietary fiber, essential B-complex vitamins (such as niacin, thiamine, and riboflavin), minerals including iron, calcium, magnesium, phosphorus, antioxidants, and essential amino acids. This comprehensive nutritional array positions millets as valuable contributors to a balanced and nourishing diet. Gluten-Free Nature One of the notable attributes of millets is their gluten-free composition, rendering them suitable dietary alternatives for individuals with gluten sensitivities or celiac disease. This characteristic broadens the scope of millet consumption, making them inclusive in diverse dietary regimes.

Ayurvedic Perspective on Millets

Dhanya varga occurs the major component of daily diet of human being. This group of food items can be further categorized as Shuka-dhanya (represents fruits of the food items having attached spines), Shimbi-shanya (represents cereals ingredients) and Shudra-dhanya (Lesser important food ingredients). The millets belong to Shudra-dhanya under Dhanya varga in Ayurveda.

Understanding millets through the lens of Ayurveda involves delving into their interactions with individual constitutions or doshas, a fundamental concept in Ayurvedic philosophy. This exploration sheds light on the unique properties of millets and their suitability for different body types.

Finger Millet (Ragi)

Finger millet (Ragi), scientific name is Eleusine coracana it is referred as Madhulika in Sanskrit. Its' cooling nature helps to mitigate excess heat and acidity. Traditionally, it is described to use in Jaloddara (ascites), Pandu (anaemia), Tridosha shamaka specially Pittashamaka. Finger millet contains high levels of calcium and polyphenols, which have a variety of beneficial functions. The finger millet ethanol extracts (FEs) had been shown an antihypertensive effect in spontaneously hypertensive rats (SHRs). FE supplementation improved the lipid profiles, including the triglyceride, total cholesterol, and low-density lipoprotein cholesterol levels, without deterioration in liver function. FEs are a potent antihypertensive nutraceutical for regulating the renin

angiotensin system and simultaneously inhibiting oxidative stress. It is a nutritious food, rich in calcium, protein, amino acids, minerals and vitamins. Hence it is considered as beneficial diet for infants, geriatric individuals and pregnant women, lactating mothers for improving milk production, prevention of malnutrition and degenerative diseases. It increases hemoglobin.

Kodo Millets (Kodrava)

Kodo millets (Kodrava), scientific name is Paspalum scrobiculatum. Its' seeds are vatakaraka, grahi and pittakapha shamaka and sometimes exhibits dizziness when it is taken as food and foodstuffs. It mainly contains protein, carbohydrates, fat and fibers and is considered to be good diet for diabetes patients in place of rice.

Pearl Millet (Bajra)

Pearl millet (Bajra), scientific name is Pennisetum glaucum it is referred as priyangu in Sanskrit. This grain is categorized as sweet (Madhura) in taste, cooling (Shita) in nature, and it undergoes sweet post-digestive effects (Madhura Vipaka). It balances tridosha doshas especially vata and pitta dosha. It is dahaprashmana and vedanasthapana. Its consumption increases deepan and vata anulomana so it counters Vata-Pitta related issue's

Sorghum Millet (Jowar)

Sorghum (Jowar), scientific name is Sorghum vulgare it is referred as yavnaal in Sanskrit, is commonly known as Great millet which seeds are used as foodstuffs. It mainly contains protein, carbohydrates, fat and fibers. It has diuretic action and nutritive to malnutrition; specially in children. This grain is characterised kashaya rasa in taste, shita, ruksha, kleda karaka and virya vardhak in nature. It balances Kapha-Pitta dosha in the body. The minerals in sorghum millets have been shown to offer potential benefits in lowering blood pressure, the risk of cancer, diabetes, heart disease, tumor incidence, and absorption of cholesterol and fat. It also delay the emptying of the gastrointestinal tract and promote gastrointestinal health. This grain is characterised kashaya rasa in taste, shita, ruksha, kleda karaka and virya vardhak in nature. It balances Kapha-Pitta dosha in the body.

Foxtail Millet (Kangni)

Foxtail (kangni), scientific name is Setaria italica it is refered as kangni in sanskrit. It mainly contains protein, carbohydrates, fat and fibers and also possesses a poisonous glycoside. It is guru (heavy), ruksha (astringent), extremely kaphanashaka and are used for fractures and vrimhana (datus-tissues) and also recommended in puerperal pain and amavata (rheumatoid arthritis). It is a good source of magnesium which is good for heart and prevents diabetes.

Porso Millet (Cheenaka)

Porso millet (Cheenaka), scientific name is Panicum miliaceum. It is especially used in sexually transmitted diseases. It is nutritious gluten free crop and a good source of energy. Studies show that proso millet contains high iron and protein content than wheat or rice; and has high content of Vitamin B3 (niacin) and hence used in Pellagra, a condition characterized by dementia, diarrhoea and dermatitis caused by deficiency of vitamin B3.

Understanding the doshic interactions and the nuanced effects of each millet variety on individual constitutions forms the cornerstone of their utilization within Ayurvedic principles.

Health Benefits of Millets

Scientific investigations and empirical evidence consistently underscore the multifaceted health advantages linked to the consumption of millets. These grains have demonstrated a myriad of positive effects on various facets of health and wellness, substantiating their status as functional foods.

Digestive Health: Millets, with their high fiber content, play a pivotal role in promoting optimal digestive health. The soluble and insoluble fiber present in millets aids in regulating bowel movements, preventing constipation, and fostering a healthy gut microbiome. This attribute is particularly beneficial for individuals grappling with digestive issues.

Blood Sugar Regulation: Millets, characterized by their low glycaemic index, serve as a promising option for individuals managing blood sugar levels or diabetes. Studies suggest that the complex carbohydrates present in millets are digested and absorbed slowly, leading to gradual rises in blood sugar levels and contributing to better glycaemic control.

Cardiovascular Well-being: Research has indicated that incorporating millets into the diet may contribute to improved cardiovascular health. Certain bioactive compounds found in millets, such as polyphenols and antioxidants, are believed to assist in lowering cholesterol levels and reducing the risk of cardiovascular diseases.

Weight Management: The combination of fiber, protein, and slow-releasing carbohydrates in millets aids in inducing satiety, curbing excessive food consumption, and regulating appetite. These properties make millets a potential ally in weight management strategies.

Overall Nutrient Density: Millets stand out as nutritional powerhouses, boasting an impressive array of essential nutrients including vitamins (especially B-complex), minerals like iron, calcium, magnesium, phosphorus, antioxidants, and vital amino acids. Their comprehensive nutritional composition offers a holistic approach to fulfilling dietary requirements.

Synergies between Modern Science and Ayurveda

The synergy between modern scientific findings and the ancient principles of Ayurveda underscores the interconnectedness of traditional wisdom and contemporary knowledge regarding millets. While scientific studies substantiate the health benefits of millets from a nutritional standpoint, Ayurveda offers a holistic perspective by considering individual constitutions or doshas.

The convergence between these two paradigms accentuates the multifaceted nature of millets as functional foods. Millets' nutritional attributes align remarkably well with Ayurvedic principles, providing a comprehensive understanding of their impact on holistic health beyond their macronutrient content. Integrating both perspectives can contribute significantly to personalized dietary recommendations, acknowledging the diverse needs of individuals based on their constitutions.

Anti-nutritional factors present in finger and pearl millets

Anti-nutritional factors are substances that reduce the availability of nutrients when present in animal feed. Their presence in pearl and finger millets is believed to limit protein and starch digestibility, hamper mineral bioavailability, and hinder proteolytic and amylolytic enzymes. Pearl millet is free of gluten and has a low glycaemic index, but despite all the positive characteristics, the antinutrients such as phytic acid, polyphenols, and tannins, can limit its functions as food or feed. Different cultivars of pearl millet contain anti-nutritional factors as phytates. Studies by, showed that pearl millet contains 354–796 mg/g−1 of phytic acid. Phosphorus in this form is not bioavailable to monogastric because it lacks the digestive enzyme phytase, which is essential when phosphorus is separated from the phytate molecule. In addition, the presence of some goitrogenic polyphenols and C-glycosylflavones, which includes glucosyl vitexin, glucosyl orientin and vitexin, may be responsible for some health problems when pearl millet is consumed. Epidemiologic evidence suggests that millet diets, in rural villages in Africa and Asia, have a role to play in the prevalent development of goitre.

On the other hand, finger millet also has its share of the antinutritional factors that include tannins, protease inhibitors, oxalates and phytates, which are believed to inversely affect the digestibility of nutrients. In addition, it has been reported that the presence of anti-nutritional compounds such as phytates, phenols, and tannins in finger millet, have a negative effect on the utilisation of nutrients. The antinutrient tannin is believed to decrease feed intake and feed efficiency. The amount of tannin is believed to be the highest in finger millet in comparison to other millets, which ranges from 0.04 to 3.74% of the catechin equivalents. Furthermore, the antinutrients found in finger millet are believed to vary under different environmental conditions as observed by.

Fortunately, the proportion of these antinutritional factors can be reduced by applying different processing methods. Numerous processing techniques such as dehulling, milling, malting, blanching, parboiling, acid and heat treatments, and the fermentation of some forms of pearl millet, seem to reduce the antinutrient factor. Sharma and Kapoor, found that germination and deranging coupled with autoclaving, have been proven to be effective in reducing phytic acid and polyphenols. Similarly, found that antinutritional factors can be reduced to a limited amount through the application of various processing techniques such roasting, soaking, boiling, parboiling, fermentation, milling, germination, decortications, and extrusion.

Challenges and Opportunities in Millet Adoption

1.Limited Awareness and Accessibility

One of the primary impediments to widespread millet adoption is the lack of awareness regarding their nutritional value and culinary versatility. Initiatives focusing on education and awareness campaigns are pivotal to dispel misconceptions and popularize millets as viable dietary alternatives. Furthermore, improving accessibility through better availability in markets and supermarkets can enhance their integration into everyday diets.

2.Infrastructural Barriers

Insufficient infrastructure for processing, marketing, and distribution poses challenges in making millets more accessible to consumers. Investments in infrastructure development and value chain enhancement are essential to bridge this gap.

Supporting small-scale farmers involved in millet cultivation through technological advancements and market linkages can bolster production and distribution channels.

3.Culinary Perception and Consumer Acceptance

Changing consumer perceptions and taste preferences is crucial for wider acceptance of millets. Promoting millets not just as healthy alternatives but also as delicious and versatile ingredients in various cuisines can drive their acceptance. Culinary workshops, recipe development, and collaborations with chefs can showcase the culinary appeal and diverse usage of millets, encouraging their incorporation into diverse dishes.

4. Sustainable Food Practices and Environmental Impact

The cultivation of millets requires fewer resources compared to water-intensive crops like rice and wheat, making them environmentally sustainable. Emphasizing their role in sustainable agriculture and their minimal ecological footprint can further bolster their adoption in an era marked by concerns over climate change and environmental sustainability.

Conclusion

The resurgence of millets signifies a pivotal shift in dietary paradigms, marking a return to ancient grains that offer a wealth of nutritional and holistic wellness benefits. This article has journeyed through the nutritional landscape and the rich tapestry of ancient wisdom to illuminate the profound significance of millets in the modern pursuit of holistic health.

Nutritional Richness and Culinary Versatility: Millets, revered for their nutritional density, boast an exceptional composition comprising essential nutrients like fiber, B-complex vitamins, minerals, antioxidants, and amino acids. Their gluten-free nature elevates their suitability for diverse dietary preferences, catering to those with gluten sensitivities. Moreover, their culinary adaptability presents a canvas for culinary innovation, offering delectable possibilities in diverse cuisines worldwide.

Aligning with Ayurveda: Holistic Wellness Embodied Exploring millets through the lens of Ayurveda unravels a deeper understanding of their effects on individual constitutions or doshas. Finger millet, with its cooling properties, resonates with individuals seeking balance in Pitta dosha, while pearl millet aligns favourably with Kapha dosha. This alignment with Ayurvedic principles emphasizes personalized wellness, highlighting millets' capacity to address specific health imbalances.

Holistic Health Impacts: Scientific and Traditional Validation Scientific research substantiates the health benefits linked to millet consumption, encompassing improved digestive health, regulated blood sugar levels,

enhanced cardiovascular well-being, effective weight management, and a nutrient-rich profile. This empirical evidence aligns seamlessly with the principles espoused by ancient wellness systems, emphasizing a holistic approach to well-being that transcends mere nutrient content.

Challenges and Opportunities: Shaping the Millet Movement While millets offer a plethora of health advantages, their widespread adoption faces challenges. Limited awareness, accessibility issues, and insufficient infrastructure for processing and marketing hinder their integration into mainstream diets. However, these challenges present opportunities for education, awareness campaigns, and infrastructural development to promote millets as sustainable, nutritious alternatives. Embracing Tradition in Modern Wellness Practices The resurgence of millets signifies more than a dietary shift; it symbolizes a return to embracing traditional wisdom in fostering holistic wellness. The convergence of modern scientific insights with ancient wellness principles, such as those embedded in Ayurveda, underscores the transformative potential of integrating millets into contemporary dietary practices.

Towards a Nourished Future: Holistic Health and Sustainability As the world grapples with health crises and sustainability concerns, millets offer a beacon of hope—a sustainable, nutrient-dense solution that marries nutritional excellence with holistic wellness. By overcoming challenges, fostering awareness, and leveraging their intrinsic potential, millets can pave the way for a nourished future, promoting health, wellness, and sustainability on a global scale. In essence, the resurgence of millets heralds a renaissance—an amalgamation of ancient wisdom and modern science—ushering in an era where traditional grains like millets serve as foundational pillars in the quest for holistic well-being and sustainable nourishment.

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