ISSN: 2322 - 0902 (P)
ISSN: 2322 - 0910 (O)

International Journal of Ayurveda and Pharma Research

Review Article

# REDEFINING FOOD FUTURES WITH FINGER MILLET - AN UNTAPPED NUTRITIONAL RESOURCE

**Pallavi B. P**
Assistant Professor, Department of Swasthavritta, Maria Ayurveda Medical College & Hospital, Marthandam, Tamil Nadu, India.

**Article info**

**Article History:**
Received: 11-08-2025
Accepted: 15-09-2025
Published: 15-10-2025

**KEYWORDS:**
Finger millet, Functional foods, *Narthaki*, Nutritional security, Nutritional benefits.

## ABSTRACT

The emerging public awareness of health care and nutrition endorses the capability of phytochemicals like dietary fibre and polyphenols on their health-desirable characteristics. Thus, it is necessary to recognize contemporary sources of nutraceuticals and other wholesome, natural products that have the desired practical qualities. Finger millet, one of the lesser-known crops has renowned recognition with its health advantages, with certain benefits attributed to its polyphenols and dietary fibres. Its protein and lipid content are equivalent to that of rice, and it surpasses rice and wheat in terms of mineral and micronutrient levels. In terms of nutrition, it has an exceptional amount of calcium (344 mg/100g) and dietary fibre (15–20%) and phenolic compounds (0.3% to 0.3%). The crop's resistance to environmental stresses including drought and deficient soil fertility further emphasises how important it is for guaranteeing food security in harsh climes. The inadequate availability of proper marketing channels for these crops has accelerated their decline both in production and consumption level. The creation of value-added products, together with focused breeding efforts for production enhancement and improved nutritional value, are methods to maximize the potential of finger millet. This review aims to investigate various applications of finger millet, its utilization, bio accessibility, and possible health advantages, in an effort to encourage further research.

## INTRODUCTION

Nutritional contentment is the sustainable force for health and development and optimization of genetic potential. It has become apparent that a community's nutritional dignity is the significant index of a country's development. Malnutrition is considered as a national issue which hinders the national development. "India is home to the world's largest food insecure population, with more than 500 million people who are hungry", said by the India State Hunger Index (ISHI). In India Food insecurity has been recognised as “pressing public health concern”.[1] Food security at household level means when every member of the family always has access to enough food to meet their daily needs at every instance.[2]

Access this article online

Quick Response Code

https://doi.org/10.47070/ijapr.v13i9.3801



The Public Distribution System (PDS), which was put into place by the government, intended to reduce hunger by giving economically underprivileged households access to basic staples like rice and wheat at a low cost. The emphasis on rice and wheat in these initiatives has worsened the effects of poor nutrition. The threat of malnutrition continues to exist despite the possibility that cereal focused PDS may reduce hunger. India now faces the trifecta of nutrient deficits, obesity, and malnutrition. The country is home to 224.3 million people who are undernourished, according to a study by Food and Agriculture Organization covering the years 2019 to 2021. Dietary quality needs to be taken into account in order to address the challenges of entrenched food insecurity and malnutrition. It is important to foster the heterogeneity of food production both at national and household level in conjunction with rising yields. Cultivating conventional food crops compatible for the geographic area is one of the feasible and promising approaches for enhancing food security.

As a direct consequence of the green revolution, caused an utmost transformation in the

eating patterns of the Indian population favouring refined carbohydrates much like polished rice and wheat which decreased the comprehensive intake of dietary fibre.[3] Increased wheat and rice production typically results in a higher calorie intake.[4] Millets have nearly vanished from the diet of a wider proportion of the Indian population as a result of the green revolution's too much emphasis on the production of wheat and rice.[5] The diminished consumption of millets can be linked to the shift in socioeconomic status since millets have been referred to as the "poor man's crop" and is thus ignored or poorly utilised in commercial systems.[6] In light to the fact that millets have superior nutritional qualities and health advantages than rice, it makes sense to increase millet production, consumption, and utilisation to combat chronic metabolic diseases like obesity and diabetes.[7]

## MATERIALS AND METHODS

During the procedure of data synthesis, comprehensive search strategies were used. Databases such as PubMed, Scopus, Google scholar, and databases related to Ayurveda were thoroughly reviewed using keywords and Boolean operators. Keywords such as "Finger millet", "Orphan crop", "Nutritional security", "Nutritional benefits", "Ayurveda", and "Functional food" were used using Boolean operators (AND, OR, NOT) to increase the accuracy and thoroughness of research. Using the keywords "Finger millet and Nutritional security" a total of 79 articles were shown stating the role of finger millet in solving nutritional insecurity. After applying certain filters 38 articles were excluded that are not directly related to the topic. The final set of 41 articles were analysed in depth to provide the potential of finger millet in resolving the aftermaths of nutritional insecurity.

## AIMS AND OBJECTIVES

- To conduct a comprehensive review regarding the potential of finger millet in combating micro and macronutrient deficiency.
- To review the nutritional benefits of finger millet.
- To explore and explain the contemporary food products available today using finger millet.
- To harness the effective approaches to utilize the potential of finger millet.

## Millets and Ayurveda

Ayurveda, the ancient system of medicine outlines the importance of three basic pillars for promoting health and strength- *Ahara, Nidra* and *Brahmacharya*. Among these, *Ahara* (food) is the fundamental human requirement and an important pillar in maintaining health according to Ayurveda. The most important component of a healthy existence is food, which, if consumed improperly, may also be the source of many ailments. Therefore, the conventional food system plays an essential role in preserving peoples' health and wellness. Millets were one of the first traditional food crops to be cultivated and the first meal that humans consumed. Ayurveda classics has given a thorough explanation of millets in *Dhanya Varga* (group of grains) along with its nutritional benefits[8]. In Charaka Samhitha, millets like *Kodo* millet (*Kodrava*) and Barnyard millet (*Shyamaka*) are mentioned in *Dhanya Varga* with the properties of *Kashaya Madhura rasa* and *Shita Virya*. Bhavaprakasha Nighantu also mentioned *Kshudra Dhanya* in *Dhanya Varga* with *Kashaya Madhura Rasa, Ushna Veerya, Katu Vipaka* properties. It balances *Vata* and *Raktha* and reduces *Pitta* and *Kapha*. Millets can be consumed as a preventive and therapeutic food in healthy individuals. Classics have mentioned the use of millets not only in preventive aspects, but it can be used as therapeutic food also. One of the notable therapeutic applications is "*Pathya*" to various ailments.

Millets are a class of small - grained cereal food crops that are extremely rich in nutrients and cultivated on soils with poor fertility or marginal soils with minimal requirements like pesticides and fertilizers. They provide a significant contribution to the nation's food and nutritional security. Many varieties of millet crops are indigenous to India and are referred to be Nutri-cereals. Millets are rain-fed crops that thrive in areas with little precipitation, giving them a bigger role in sustaining agriculture and ensuring global food security. The millets are categorized into major millet and minor millets based on the area farmed and the size of their grains. The major millets include sorghum and pearl millet. Finger millet, foxtail millet, little millet, kodo millet, barnyard millet, proso millet, and brown top millet are categorized under minor millets.

### Finger millet

Millets are rich in nutrients and health-promoting phenolic compounds making it perfect for food and feed. Millets are regarded as smart food since they are "good for you" (healthy and nutrient-rich), "good for the planet" (requires less water to grow and has a reduced carbon imprint), and "good for the farmer (adaptation to changing climate).[9] The phenolic properties present in millets consist of phenolic acids, flavonoids, and tannins, which are favourable to human health. Compared to other varieties of millet, finger millet has a highly distinctive, rich, and varied phenolic profile and these phenolic characteristics have great antioxidant action. Among all the varieties of major and minor millets, finger millet plays a significant role in reducing malnutrition as the protein present in finger millet is regarded as superior with the inclusion of essential amino acids like lysine, threonine and valine.[10] The finger millet seed, which is an edible component and a rich source of phytochemicals, dietary fibre, polyphenols, minerals, and particularly calcium, cannot be disregarded for

boosting the nutritional and therapeutic qualities of prepared dishes. [11]

Finger millet (*Eleusine coracan*), widely known as Ragi and Mandua in India, is a minor cereal. It is native to Ethiopia but broadly cultivated throughout various parts of India and Africa. It is a staple food that provides an adequate quantity of protein and calories to an extensive portion of the population in these countries, particularly among low-income groups.[12] With 58% of the world's output of finger millet produced in India, Karnataka is the main producer, although not many Indians are conscious of its nutritional worth and health advantages. In terms of production area, finger millet ranks sixth in India, behind wheat, rice, maize, sorghum, and bajra.

Ayurveda correlates finger millet to *Nartaki*, which is a *Kshudra Dhanya. Narthaki* is *Tiktha madhura kashaya rasa* and *Sheeta virya*. It has *Snigdha guna* and properties of *Balya* and *Vrishya*. It can be advised in skin diseases, *Rakthapitta* and *Amlapitta* as it is predominant in *Tiktha kashaya madhura rasa* and *Sheetha virya*. It is advised in *Sthoulya* and *Prameha* due to its properties.

**Nutritional significance of finger millet**

The seed coat (Testa), the embryo, and the endosperm are the primary components of the grain kernel. Only the red species of finger millets as opposed to those that are yellow, white, tan, red, brown, or violet are farmed extensively on a worldwide scale. When compared to other millets, finger millet is exceptional due to the proximity of Penta layered Testa. This may be one of the plausible explanations for the greater dietary fibre content in finger millet.[13]

The dietary supplements of finger millet lie in its high content of calcium (0.38%), protein (6%–13%), dietary fiber (18%), carbohydrates (65%–75%), minerals (2.5%–3.5%), phytates (0.48%), tannins (0.61%), phenolic compounds (0.3–3%) and trypsin inhibitory factors. In finger millet, more than 50 phenolic compounds were found, including phenolic acids and their derivatives, dehydrodiferulates and dehydrotriferulates, flavan-3-ol monomers and dimers, flavonols, flavones, and flavanonols. The phenolic compounds found in finger millet, such as quercetin, p-coumaric, protocatechuic, ferulic, p-hydroxy benzoic, vanillic, syringic, and gallic, have significant anti-diabetic and antioxidant activities. They also precisely suppress cataract. [14] Due to the abundant source of dietary fiber and the presence of antinutritional components, intake of finger millet considerably reduces plasma glucose levels when compared to rice and wheat. [15] The grains and certain finger millet portions swear in the management and prevention of diabetes, and it has beneficial effects on the synthesis of nerve growth factors and wound healing abilities in the first stage of diabetes. [16] The phenolic and anti-oxidant contents in finger millet helps to enhance health and safeguard from ageing and metabolic syndromes. The extracts from the seed coat revealed antimicrobial activity against Aspergillus flavus and Bacillus cereus.[17,18] Finger millet showed anti tumerogenic effect against K562 chronic myeloid leukaemia. Finger millet seeds possess a bifunctional complex of -amylase-trypsin inhibitor, also referred as RBI (Ragi Bifunctional Inhibitor), which hinders amylase and trypsin at the same time. This complex has anti-proliferative activity on K562 chronic myeloid leukaemia.[19,20]

Osteoporosis is mostly brought on by a lack of dietary calcium and vitamin D, which aids in calcium absorption. To address these inadequacies, a variety of approaches have been used, such as dietary fortification or the addition of calcium and vitamin D supplements. Early childhood should be the starting point for a safe and long-lasting diet-based strategy to address calcium and vitamin D shortage. This may be done by taking foods innately high in calcium and maintaining adequate vitamin D status through sun exposure, food, and/or supplements.[21] It is notable that finger millet is balanced with other minerals like zinc and magnesium and has been found to be persistently high in calcium despite other varieties. [22] This is probably going to be helpful for building strong bones during the developmental stage, especially during adolescence when the majority of bone calcium accumulation takes place. It is important to attain an increased level of bone mass for combating osteoporosis and bone fractures in adulthood.[23] Even though milk and its by-products are frequently suggested in programmes intended to alleviate calcium insufficiency, finger millet also shows great potential because of its high calcium content and affordability in regions where it is grown. [9]

**Bio-accessibility of finger millet bioactive compounds**

Bioaccessibility is defined as the quantity of a compound that is released from its matrix in the gastrointestinal tract, becoming available for absorption (e.g., enters the blood stream). The ejection and further effectiveness of bioactive compounds in foods depend on their accessibility to enzymatic breakdown either inside the food itself or in the gastrointestinal system. The secretion of bioactive compounds from the cereals inside the gastrointestinal tract is very limited in spite of their connection with the cell matrix elements particularly polyphenols, dietary fibre along with other antinutritional elements like phytates and tannins.[24] The possible bio-accessibility of bioactive substances in finger millet has just lately come to light in a small number of studies, with a particular emphasis on minerals and phenolic compounds. The influence of malting on the accessibility and availability of zinc, copper, iron,

manganese, and iron was assessed. The results showed a modest reduction in mineral contents following malting, while an improvement in the bioavailability of calcium and iron was noticed.[25] A comparable increase in bioaccessible iron was seen after germinating finger millet seeds. The rise in bioaccessible iron is due to the activation of endogenous enzymes such as phytase and esterases, which function on polyphenols or phytate mineral complexes and causes the liberation of minerals. After consuming the germinated grain diet for six months, this increase had a favourable impact on the haemoglobin and serum ferritin levels of the children.[26]

In addition to dietary composition and antinutritional elements, processing techniques have a significant role in figuring out the bio-accessibility of cereal bioactive components. The impact of processing techniques like microwave heating, sprouting, pressure cooking, roasting, and open pan boiling on the phenolic profile and bio-accessibility of finger millet was assessed. Different processing methods ended up causing a reduction in both the phenolic and flavonoid levels except from roasting. The loss remarked in the sprouted grains was ascribed to the reduction of phenolic elements while soaking. Endogenous phenolic enzymes become active during germination, generating hydrolysis and subsequent decrease during soaking. However, it was shown that sprouting and roasting had a beneficial effect on the bio-accessibility of phenolic chemicals in the grain, with a 67% rise after sprouting.[27] In comparison to pH treatment and colonic fermentation, greater bio-accessible total phenolics were seen during gastric and gastrointestinal digestion. The rise was linked to the liberation of conjugated phenolics from the grain because of protein digestion.[28]

**Finger millet based functional foods**

The food manufacturing sector is actively developing novel products and as a result of increased consumer awareness, there is a growing demand for wholegrain meals made from cereals. This tendency improved the use of underutilized crops in food products, providing a healthier alternative to staple foods.[29] Owing to the high presence of minerals, flavonoids, and amino acids, finger millets can be formulated as food-based nutraceuticals in the form of highly customised medication or therapeutic agents.[30-32] Compared to other commonly consumed grains, finger millet is a crop with significant potential but untapped nutraceutical qualities. According to the FAO and WHO's 2017 agenda, in an era of widening disparities and the disadvantages of achieving food security through dietary diversity, these qualities of millets ought to be used to create finger millet as a unique functional food.[33] Aside from this, the inclusion of these characteristics into other main crops might enhance the contentment of the general population by equipping surplus functional foods worldwide. Considering the global health and nutritional problem, finger millet's biofortification looks to be crucial for both the western world and lower- and middle-income nations. Many of the crop enhancement techniques are focused on main cereals like wheat, rice, etc although the focus on minor cereals like finger millet and other overpriced functional foods falls behind mainly in developing nations.[34]

**Finger millet based contemporary foods**

Millets could be mixed with cake, cookies, bread, and biscuits to provide proteins and micronutrients. Bakery products like biscuits, cakes and cookies can be developed by incorporating finger millet with wheat flour. [35] In regional foods like idli, Puttu, Adai, and Dosa, finger millet can be utilised in place of ordinary grains. There are also reports of other conventional foods including Ladoo, Halwa, Burfi, and Papad which can be prepared using finger millet.[36] Finger millet is also used to prepare Indian type of bread called chapatti, which is quite palatable.[37] Besides this it is also used as a nourishing food for infants when malted and is regarded as wholesome food for diabetic's patients.

Finger millet is widely used to make non-alcoholic drinks because of its adaptability and nutritional content. Sur is a finger millet based fermented beverage mostly prepared in the regions of Himachal Pradesh.[38] Other finger millet-based alcoholic drinks made and consumed in Arunachal Pradesh includes madua, themsing, rakshi, mingri, and lohpani.[39] Koozh mostly consumed by the ethnic communities in Tamil Nadu is prepared using finger millet flour and rice.[40]

**Microgreens- a novel solution to address nutritional insecurity**

Microgreens are fragile, immature greens that grow from the seeds of herbs and vegetables. They either have a main pair of first genuine leaves or two fully developed cotyledon leaves.[41] They are part of a novel category of edible plants that have great potential for treating a range of nutritional inadequacies. Despite their diminutive size, microgreens have surprisingly strong flavours, brilliant colours, and pleasing textures, making them ideal as both salad toppings and edible garnishes.[42] According to research by Arya et al., ragi microgreens have the highest calcium level of all the microgreens they evaluated in terms of their nutritional value. Microgreen cultivation offers several advantages, including a short growing cycle, minimum space needs, and affordable output.[43] Microgreen production is now receiving attention because of its ability to strengthen economic stability, food security and nutritional wellbeing among farmers. However,

research concerning the nutritional value of millet microgreens are very less.

**Approaches to effectively harness the potential of finger millet**

- Incorporating finger millet as a convenient ready to reconstitute food product.
- Incorporating finger millet in the manufacturing of nutri-bars, bread, biscuits which are a rich source of micro and macro nutrients.
- Introducing finger millet in the public distribution system which can be easily accessible to everyone.
- Incorporating finger millet with the probiotic industry as it helps to maintain a good gut microflora.
- By increasing the shelf life will be helpful in the post-harvest management.

**CONCLUSION**

Finger millet can be used in a range of food formulations to produce products with extra nutritional value because of its harmonious protein profile and gluten-free properties. These qualities should put these grains in the correct category when it comes to alternative crops, yet millet was dubbed the "lost crop" owing to its dearth of attention. An interest in finger millet has grown as a result of the present issues with sustainable food production, climate changes, water shortages, and overpopulation. Finger millet, formerly regarded as inferior coarse grains, are today hailed as super grains for the immense health, economic, and environmental advantages they provide. This might be a strategic grain which can be used as a supplementary food in rural/marginal areas where much of the population suffers from malnutrition. Even if the consumption of finger millet is unique and will likely remain such, it is still important to get it known to a wider audience, and designing dishes that are popular with the public can aid in this effort. People should be informed about the nutritional content and health advantages of finger millet and the food products manufactured from it. Historically, millets have provided consistent protection for poor farmers, reducing the risks posed by the unpredictable Indian monsoon. Looking forward millets have the ability to protect us from the dangers presented by climatic change.

**REFERENCES**


1. Dhamija G, Ojha M, Roychowdhury P. Hunger and health: Re-examining the impact of household food insecurity on child malnutrition in India. J Dev Stud 2022;58:1181–210. https://doi.org/10.1080/00220388.2022.2029419
2. FAO, IFAD, UNICEF, WFP, WHO. The state of food security and nutrition in the world: transforming food systems for affordable healthy diets. Rome: FAO; 2020.
3. Shetty PS. Nutrition transition in India. Public Health Nutr [Internet]. 2002; 5(1A): 175–82. Available from: http://dx.doi.org/10.1079/PHN2001291
4. Hazell, P.B. The Asian green revolution, Intl. Fd. Policy Res. Inst., 2009.
5. Gopalan C. The changing nutrition scenario. The Ind. J Med Res. 2013;138.
6. Kaur, K.D., Jha, A., et al. Significance of coarse cereals in health and nutrition: A review. J. Fd. Sci. Technol., 2014, 51, 1429-1441.
7. Management Association IR. Food Science and Nutrition: Breakthroughs in Research and Practice: Breakthroughs in Research and Practice. IGI Global. 2018;
8. Kaiyadeva. Kaiyadeva Nighantu (Pathyapathya-Vibodhaka). Edited by P. V. Sharma & Guru Prasad Sharma (Prof. Priyavrata & G. P. Sharma). 1st ed. Varanasi: Chaukhambha Orientalia; 1979
9. Poole, N.; Kane-Potaka, J. The smart food triple bottom line-Starting with diversifying staples-Including summary of latest smart food studies at ICRISAT. Agric. Dev. J. 2020, 41, 21–23. Available online: taa.org.uk/wp-content/uploads/2021/01/Ag4 Dev41_Winter_2020_WEB.pdf
10. Ravindran G. Studies on millets: proximate composition, mineral composition, and phytate and oxalate contents. Food Chem. 1991;39(1):99–107. doi: 10.1016/0308-8146(91)90088-6.
11. Hadimani NA, Malleshi NG (1993) Studies on miling, physico-chemical properties, nutrient composition and dietary fiber content of millets. Journal of Food Science and Technology 30 (1), 17-29.
12. M.M.O'Kennedy, A. Groot boom, P.R. Shewry, Harnessing sorghum and millet biotechnology for food and health, J.CerealSci.44(3(2006) 224–235.
13. Food and Agricultural Organisation (FAO) of the United Nations, Sorghum and Millets in Human Nutrition (FAO Food and Nutrition Series, No.27), 1995, ISBN92-5-103381-1.
14. Saleh, A. S., Zhang, Q., Chen, J., and Shen, Q. (2013). Millet grains: nutritional quality, processing, and potential health benefits. Compr. Rev. Food Sci. Food Saf. 12, 281–295. doi: 10.1111/1541-4337.12012.
15. Kumari, P. L., and Sumathi, S. (2002). Effect of consumption of finger millet on hyperglycemia in non-insulin dependent diabetes mellitus (NIDDM) subjects. Plant. Foods. Hum. Nutr. 57, 205–213. doi: 10.1023/A:1021805028738.
16. Kam, J., Puranik, S., Yadav, R., Manwaring, H. R., Pierre, S., Srivastava, R. K., et al. (2016). Dietary interventions for type 2 diabetes: how millet comes to help. Front. Plant Sci. 7:1454. doi: 10.3389/fpls.2016.01454.
17. Bravo, L. (1998). Polyphenols: chemistry, dietary sources, metabolism, and nutritional significance.

Nutr. Rev. 56, 317–333.doi: 10.1111/j.1753-4887. 1998. tb01670.
18. Radhajeyalakshmi, R., Yamunarani, K., Seetharaman, K., and Velazhahan, R. (2003). Existence of thaumatin-like proteins (TLPs) in seeds of cereals. Acta Phytopathol. Hung. 38, 251–257. doi: 10.1556/APhyt.38.2003.3-4.5.
19. S.Sen, S.K. Dutta, S. Ghosh Dastidar, Development of a highly potent therapeutic regimen for chronic myeloid leukemia using the extract of Eleusine coracana seeds, Int.J. Biomed. Pharm. Sci. 5(1) (2011) 7–11.
20. B. Shivaraj, T.N. Pattabiraman, Natural plant enzyme inhibitors. Characterization of an unusual alpha-amylase/trypsin inhibitor from ragi (Eleusine coracana Geartn.), Biochem. J. 193(1981) 29–36.
21. Puranik, S.; Kam, J.; Sahu, P.P.; Yadav, R.; Srivastava, R.K.; Ojulong, H.; Yadav, R. Harnessing finger millet to combat calcium deficiency in humans: Challenges and prospects. Front. Plant Sci. 2017, 8, 1311.
22. Longvah, T.; Ananthan, R.; Bhaskarachary, K.; Venkaiah, K. Indian Food Composition Table; National Institute of Nutrition: Hyderabad, India, 2017.
23. Bhide, R.; Patil, S.; Shetty, S.; Narayanan, S. Comparative bioavailability studies of calcium from different sources. Asian J. Pharm.Clin. Res. 2013, 6, 147–148.
24. Cardoso C., Afonso C., Lourenco H., Costa S., Nunes M.L. (2015): Bioaccessibility assessment methodologies and their consequences for the risk–benefit evaluation of food. Trends in Food Science and Technology, 41: 5–23.
25. Platel K., Eipeson S.W., Srinivasan K. (2010): Bioaccessible mineral content of malted finger millet (Eleusine coracana), wheat (Triticum aestivum), and barley (Hordeum vulgare). Journal of Agricultural and Food Chemistry, 58: 8100–8103.
26. Tatala S., Ndossi G., Ash D., Mamiro P. (2007): Effect of germination of finger millet on nutritional value of foods and effect of food supplement on nutrition and anaemia status in Tanzanian children. Tanzanian Health Research Bulletin, 9: 77–86.
27. Hithamani G., Srinivasan K. (2014): Effect of domestic processing on the polyphenol content and bioaccessibility in finger millet (Eleusine coracana) and pearl millet (Pennisetum glaucum). Food Chemistry, 164: 55–62.
28. Chandrasekara A., Shahidi F. (2012): Bioaccessibility and antioxidant potential of millet grain phenolics as affected by simulated in vitro digestion and microbial fermentation. Journal of Functional Foods, 4: 226–237.
29. Alaunyte I, Stojceska V, Plunkett A, Ainsworth P, Derbyshire E (2012) Improving the quality of nutrient-rich Teff (Eragrostistef) breads by combination of enzymes in straight dough and sourdough breadmaking. J Cereal Sci 55(1): 22–30.
30. Kumar A, Metwal M, Kaur S, Gupta AK, Puranik S, Singh S, et al. Nutraceutical value of finger millet [Eleusine coracana (L.) Gaertn.], and their improvement using omics approaches. Front Plant Sci 2016; 7: 934. Available from: https://doi.org/10.3389/fpls.2016.00934. Published online 2016.
31. Puranik S, Kam J, Sahu PP, Yadav R, Srivastava RK, Ojulong H, et al. Harnessing finger millet to combat calcium deficiency in humans: challenges and prospects. Front Plant Sci 2017; 8: 1311. Epub 2017 Jul 26.
32. Joint FAO/WHO Food Standards Programme Codex Committee on Food Labelling 44th Session Asuncio´n, Paraguay, 16 20 October 2017. http://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/ ?lnk 5 1&url 5 https%253A%252F%252Fworkspace.fao.org%252.Fsites%252Fcodex %252FMeetings% 252FCX-714-44%252, accessed Nov 6, 2017.
33. FAO of the UNO. Guidelines on assessing biodiverse foods in dietary intake surveys, 2017. http://www.fao.org/documents/card/en/c/5d2034ff-a949-482a-801c-44b7b675f1dd/.
34. Gupta SM, Arora S, Mirza N, Pande A, Lata C, Puranik S, et al. Finger millet: a “certain” crop for an “uncertain” future and a solution to food insecurity and hidden hunger under stressful environments. Front Plant Sci, 8. 2017. p. 643. Epub 2017 Apr 25.
35. Shadang C, Jaganathan D. Development and standardisation of formulated baked products using millets. Int J Res Appl Nat Soc Sci. 2014; 2: 75-8.
36. Malathi D, Thilagavathi T, Sindhumathi G. Traditional recipes from finger millet. Coimbtore: Postharvest Technology Centre, Agricultural Engineering College and Research Institute, Tamil Nadu Agricultural University; 2012.
37. Kaur L, Kumar K, Kumar R, Yadav AN. October 78 Role of millets as functional food. National conference on technology on food systems. Sangrur, Punjab, India: Department of Food Engineering and Technology; 2016.
38. Kumar A. Refinement of the traditional sur production in Himachal Pradesh, Thesis-Master in Food Technology. Dr.YS Parmar University of Horticulture and Forestry, Nauni, Solan; 2013.
39. Shrivastava K, Greeshma AG, Shrivastava B. Biotechnology in action-a process technology of alcoholic beverages is practices by different tribes of Arunachal Pradesh, North East India. Indian J Trad Knowl. 2012; 11: 81–9.

40. Ilango S, Antony U. Assessment of the microbiological quality of *Koozh*, a fermented millet beverage. African J Microbiol Res. 2014;8(3): 308–12.
41. Xiao Z, Lester GE, Luo Y, et al. Assessment of vitamin and carotenoid concentrations of emerging food products: Edible microgreens. J Agric Food Chem. 2012;60(31):7644-51.
42. Pinto E, Almeida AA, Aguiar AA, et al. Comparison between mineral profile and nitrate contents of microgreens and mature lettuce. J Food Comp Anal. 2015; 37:38-43.
43. Kumar S, Jasmin LB, Saravaiya. Microgreens: A new beginning towards nutrition and livelihood in urbanperi- urban and rural continuum. In: Technologies and Sustainability of Protected Cultivation for Hi-Valued Vegetable Crops. Navsari Agricultural University, Gujarat, India. 2018: 246-61.

**Cite this article as:**
Pallavi B.P. Redefining Food Futures with Finger Millet - An Untapped Nutritional Resource. International Journal of Ayurveda and Pharma Research. 2025;13(9):143-149.
https://doi.org/10.47070/ijapr.v13i9.3801
***Source of support: Nil, Conflict of interest: None Declared***

***Address for correspondence**
**Dr. Pallavi B. P**
Assistant Professor,
Department of Swasthavritta,
Maria Ayurveda Medical College & Hospital, Marthandam, Tamil Nadu.
Email: drpallaviakhil@gmail.com