JUST AGRICULTURE
multidisciplinary e-Newsletter

Millets: A Nutri Cereal Food for Healthy Life

[1]Priyanka Kakati, [2]Anirban Dutta, [3]Devendra Kumawat and [4]Amit Yadav

[1]Assistant Professor, Faculty of Agriculture Sciences and Technology, Assam Down Town University

[2]M.Sc. Research Scholar, Department of Agronomy, Assam Agriculture University, Assam.

[3]Lecturer cum Farm Manager, Department of agronomy at Shrinathji College of Agriculture, Nathdwara, Rajsamad, Rajasthan MPUAT, Rajasthan.

[4]M.Sc. (Ag.) Agronomy, BHU, Baranasi

ARTICLE ID: 32

Abstract:

The flatbread known as roti is made in India from ground millet seeds. The small "grain" is high in vitamins and minerals and devoid of gluten. Millet grain is incredibly nutrient-dense and rich in high-quality protein, minerals, dietary fibre, phytochemicals, and vitamins. We look at the nutritional profiles of millets in comparison to rice and wheat. The protein content of foxtail, proso, and pearl millets is higher than that of wheat. The fibre contents of foxtail, barnyard millet, kodo, and little are higher. Interestingly, the calcium content of 100g of finger millet is 344.00 mg. Cereal-based food products have become more and more popular because of the nutritional and practical benefits of adding millet to them. Value-added millet products have immense growth potential and the potential to add value to enterprises, since customers feel that millet-based meals and millets directly improve their health.

Introduction:

Millets differ from one another in terms of appearance, maturity, grain type, and physical traits. However, because of their worse cooking quality, lower preference due to wealth, and additional processing time and effort, these crops are underutilized and ignored. Many other crops are underutilized because of the decrease in dietary choices brought about by improvements in the processing and productivity rise of dominant crops like rice, wheat, maize, and some others. Millets are extremely nutritious, commonly farmed, small-seeded crops that require little irrigation and can withstand drought conditions. They often have a brief

JUST AGRICULTURE
multidisciplinary e-Newsletter

growing season, don't attract pests, and grow without the need for extra fertiliser. A staple food in many countries of the world, especially in China, India, and some portions of Africa, millets are an indigenous crop. In India, the proverb "A rice eater is always weightless like a bird; a jowar eater is strong like a wolf; a ragi eater is always disease-free" is well recognized. It originates from Kannada. Millets are cultivated early in part because of their versatility and endurance to a variety of growing situations. Malnutrition is defined by the World Health Organization (WHO) as deficiencies, excesses, or abnormalities in an individual's food and energy intake (WHO and World Bank 2019). Popular small-seeded annual grasses or grains, millets belong to the Poaceae family and are native to Ethiopia.

Health Benefits of Millets:

- **Anti-cancerous effect of millet:** Millets include phytosterols, b-glucans, antioxidants, and lignins that help prevent colorectal, breast, prostate, and many other types of cancer. Dietary sitosterol (SIT) found in millets may offer defence against chemically induced colon cancer. With SIT, the number of tumor-bearing rats is greatly decreased. Lignins are anti-cancerous and boost bifidobacterium growth by generating short fatty acid chains of propionate, acetate, and butyrate. By reducing the growth of cancerous lesion cells and stopping the formation of malignant tumours, butyrate functions as a secondary chemo preventive agent.
- **Effect on cardiovascular disease:** Millets include phytosterols, b-glucans, antioxidants, and lignins that help prevent colorectal, breast, prostate, and many other types of cancer. Dietary sitosterol (SIT) found in millets may offer defence against chemically induced colon cancer. With SIT, the number of tumor-bearing rats is greatly decreased. Lignins are anti-cancerous and boost bifidobacterium growth by generating short fatty acid chains of propionate, acetate, and butyrate. By reducing the growth of cancerous lesion cells and stopping the formation of malignant tumours, butyrate functions as a secondary chemopreventive agent.
- **Anti-tumorigenic effect against chronic myeloid leukemia k562 (CML) in finger millet:** Since finger millet contains ragi bifunctional inhibition (RBI), a bifunctional alpha-amylase trypsin inhibitor that simultaneously inhibits trypsin and alpha-amylase, it can be used as a nutritional grain to treat a variety of infectious disorders. In CML, myeloid cells develop out of control in the bone marrow.

JUST AGRICULTURE
multidisciplinary e-Newsletter

Strategies to increase bioavailability of millet compounds:

Germination and the hydrolysis enzyme, which alter biochemistry and result in the creation of new components and structural alterations, can both boost the nutritional value of grains. Finger millet germination produces a slow increase in sugar and decrease in starch along with the release of several anti-nutrients including tannins and phytate. A 96-hour extended germination period significantly increases the quantities of IVPD and protein. One technique that improves millets' bioavailability is fermentation; research has indicated that after fermentation, millets' nutritional value, protein availability, and in vitro protein digestibility (IVPD) all increase. Both fermentation and germination enhance the nutritional profile of sorghum millet and modify the chemical composition of anti-nutritional substances. Hassan and colleagues have demonstrated that germinated millets show an increase in protein and protein digestibility in comparison to soaked, coarsely ground, dry heated, and debranned millets. Additionally, the study revealed that fermenting coarsely ground millets during the germination stage greatly improves the quality and digestibility of the protein.

Conclusion:

Nutri-cereals, or underutilized millets, are essential for developing nations like India because of their high nutritional value, rich dietary fiber content, and ability to work well as both small- and large-scale supplements and the best fortification agent. Millets are suitable for those with constipation and wheat and gluten sensitivity since they are nutrient-rich, gluten-free, alkaline, soothing, and friendly to the digestive system. Iron, calcium, manganese, magnesium, zinc, potassium, and phosphorus are also present in millets. Its impact in maintaining cell and tissue integrity can be used to effectively treat inflammations. Flavonoids, phenolic compounds, tannins, and important amino and fatty acids are all present in millets. These are quite tasty and rich in lecithin and b-carotenoids, which makes them suitable for making functional meals such as noodles, pasta, biscuits, and multigrain bread. The body needs energy from all the nutrients for development, maintenance, reproduction, and the execution of all bodily tasks. Because they are gluten-free, millets are a high-energy, nutritious grain that, when used appropriately, can help fight heart disease, diabetes, obesity, malnutrition in terms of protein and energy, and celiac disease. A crop high in lecithin, easy to digest, and great for enhancing the senses is millet, which grows well in the dry season.

JUST AGRICULTURE
multidisciplinary e-Newsletter

References:

Ambati K, Sucharitha KV. Millets-review on nutritional profiles and health benefits. Int J Recent Sci Res. 2019;10(7):33943-8.

Chhikara N, Abdulahi B, Munezero C, et al. Exploring the nutritional and phytochemical potential of sorghum in food processing for food security. Nutr Food Sci. 2018;49(2):318-32.

Chandra D, Chandra S, Sharma AK. Review of Finger millet (Eleusine coracana (L.) Gaertn): A power house of health benefiting nutrients. Food Sci. Hum. Wellness. 2016;5(3):149-55.

Ugare R, Chimmad B, Naik R, et al. Glycemic index and significance of barnyard millet (Echinochloa frumentacae) in type II diabetics. J Food Sci Technol. 2014;51:392-5.

Verma S, Mishra S. Organoleptic properties and acceptability of ragi flour to prepare noodles. J pharmacogn phytochem. 2019;8(6):213-6.