

Millets as Potential Crop for Nutritional Security

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ARTICLE ID: 30

Abstract

Millets, ancient grains cultivated for over 5000 years, are increasingly recognized for their potential to address nutritional security, especially in regions facing food supply uncertainties and malnutrition. These drought-tolerant crops thrive under marginal soil and water conditions, making them ideal for cultivation in dry zones and developing country like India. Major millets, including sorghum and pearl millet and minor millet such as finger, foxtail, and barnyard millets are rich in essential nutrients like proteins, dietary fiber, vitamins, and minerals. They contain bioactive phytochemicals that offer significant health benefits such as antioxidants and compounds that aid in reducing blood lipid levels. Despite being traditionally labeled as "poor man's crops," millets are gaining popularity due to their nutritional superiority, climate resilience, and health-promoting properties. This article explores the role of millets in enhancing dietary diversity and their potential to support sustainable agriculture and nutritional well-being in a changing global landscape.

Keywords: Millets, Major millets, Minor Millets, Nutrition and Health.

Introduction

Millets have been cultivated for over 5000 years and thrive in dry, low-fertility conditions, making them ideal rainfed crops. Globally, malnutrition is an emerging challenge due to poor access to diverse, nutritious food and inadequate food distribution systems. The modern sedentary lifestyle associated with several health issues has urged people to seek for healthy and nutritious diets. Recently several private organizations have ventured into value addition and marketing chain of millets that has boosted millet cultivation and consumption. In developing and heavily populated country like India, millets play a key role in meeting the nutritional needs of the population. Whole grains are the richest sources of vitamins, fibre,

minerals and phytochemicals such as phenolics, lignans, β -glucan, insulin, starch, sterols, phytates and bioactive phytochemicals, which play an important role in human health.

Major Millets

The major millets include Sorghum (jowar) and Pearl millet (bajra).

Sorghum (*sorghum bicolor* L.)

- Sorghum (also known as Jowar) is the world's fifth major cereal food crop in terms of production and acreage after rice, wheat, maize and barley. In India, the sorghum grains are used mainly for food while the stover after harvest of grains is highly valuable as nutritive fodder to animals. The grains are also used as poultry feed.
- Major portion of sorghum protein is prolamin (kaffirin) which has a unique digestibility upon cooking which might be a health benefit for certain dietary groups.
- It is rich in protein, fibre, thiamine, riboflavin, folic acid, and B-carotene.
- It is rich in potassium, phosphorus and calcium with sufficient amounts of iron, zinc and sodium

Pearl Millet (*Pennisetum glaucum* L.)

- Pearl millet is commonly known as bajra is the sixth major cereal in terms of area and production and has the highest drought tolerance potential of all millets. Pearl millet is the most widely cultivated cereal in India after rice and wheat.
- Pearl millet contains considerably high proportion of protein (12-16%) as well as lipids (4-6%) and 11.5% of dietary fiber.
- The **niacin** content in pearl millet is higher than all other cereals.
- It also contains foliate, magnesium, iron, copper, zinc and vitamins E and B-complex. It has high energy content compared to other millets.
- It is also rich in calcium and unsaturated fats which are good for health.

Minor Millets

Minor millets include Finger millet (Ragi), Foxtail millet (kangni/Italian millet), Barnyard millet, Little millet, Proso millet, Kodo millet.

Finger millet (*Eleusine coracana* L.)

- Finger millet is an important primary food especially for the rural populations of Southern India and East & Central Africa. Finger millet or ragi can be grown under wide range of adaptation i.e., from sea level to hilly regions of Himalayas but thrives

best under well drained, loamy type of soils. About 60% of finger millet is produced by the state of Karnataka which is about 34% of global production.

- Finger millet is the richest source of calcium (300-350 mg/100 g)
- It contains lower levels of protein (6-8%) and fat (1.5-2%).
- Finger millet proteins are unique because of the sulphur rich amino acid contents.
- The grains have excellent malting properties and are widely known for its use as weaning foods.

Foxtail millet (*Setaria italica L.*)

- Foxtail millet is the third largest crop among the millets, cultivated for food in semi-arid tropics of Asia and as forage in Europe, North America, Australia, and North Africa. Generally grown in semi-arid regions and has a low water requirement. It matures in 65-70 days. Foxtail millet can be planted when it is too late to plant most other crops.
- It is high in carbohydrates and has double quantity of protein content compared to rice.
- It contains minerals such as copper & iron.
- It provides a host of nutrients, has a sweet nutty flavour and is considered to be one of the most digestible and non-allergic grains.

Kodo millet (*Paspalum scrobiculatum L.*)

- Kodo millet also known as ditch millet is known to be domesticated 3000 years ago and is indigenous to India. Kodo millet is majorly produced in India and accounts for 90% of total world production.
- It has high protein content (11%), low fat (4.2%) and very high fibre content (14.3%).
- Kodo millet is rich in B vitamins specially niacin, pyridoxin and folic acid as well as the minerals such as calcium, iron, potassium, magnesium and zinc.
- It contains a high amount of lecithin and is an excellent for strengthening the nervous system.

Barnyard millet (*Echinochloa esculenta A. and Echinochloa colona L.*)

- Barnyard millet is predominantly cultivated in India, China, Japan, and Korea for food as well as fodder. Japanese and Indian species of this millet are vigorous and have a wide adaptation in terms of soil and moisture requirements.

- Its grains possess other functional constituents i.e., Gamma amino butyric acid (GABA) and Beta glucan, used as antioxidants and in reducing blood lipid levels.

Little millet (*Panicum sumatrense*)

- Little millet was domesticated in the Eastern Ghats of India occupying a major portion of diet amongst the tribal people and spread to Sri Lanka, Nepal, and Myanmar. Little millet matures quickly and withstands both drought and water logging. It is smaller than other millets.
- It is high in iron content and in antioxidant activities.
- It contains about 38% of dietary fibre.

Proso Millet (*Panicum miliaceum L.*)

- Proso millet is a short-season crop cultivated in drier regions of Asia, Africa, Europe, Australia, and North America. Also called common or broom corn millet is a relatively short-duration irrigated crop with low moisture requirements.
- It contains the highest number of proteins (12.5%) and significant amount of carbohydrates and fatty acids.
- It contains high amount of calcium which is essential for own growth and maintenance.
- It reduces cholesterol level and reduce the risk of heart disease.

Conclusion

By now we are familiar with important millets and their superiority over major staple cereals with respect to nutritional values, climate resilient features, and health promoting properties. Although millets have been referred to as poor man's crop and are a staple food for more than 60% of the world's poor, the major drawback in the cultivation of millets is their productivity, which is to be addressed by increasing efforts to utilize globally available. But in present scenario changing in food habits, there is need of increase millet production to meet nutritional requirement and healthy foods for population.

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