

Health Benefits of Millets

Dr. A.H. Ansari

Professor - Chemistry

Govt. Autonomous Girls P.G. College of Excellence, Sagar (M.P.)

Abstract -

Millet is the collective term for cereals those have small seeds. These are coarse grains, grown in India and some parts of Africa. Nutritionally these are superior to major cereals with high source of fibre. Also contain vitamins, minerals, fatty acids and anti-oxidants that can help to eradicate plethora a nutritional deficiency disease. These are great immunity booster agents.

Keywords - Millets, Coarse grain, Genomic study.

Introduction -

Millets¹ are traditional grains, popular among the Indian tribes. Millets include jwar (sorghum), ragi (finger millet), Korra (foxtail) arke (kodo), sama (little millet), bajra (pearl millet), chena (proso millet). Millets also tags as "poor man's food". These are important crops in semi arid tropics of Asia and Africa. Millets are indegenous to many parts of the world. Some of the early evidence of millet cultivation in China was found at "eishan" where "proso" millet husk has been identified around 10000 years ago. On the request of Indian Government United Nations (FAO) declared "2023" as International year of Millets".

Millets are useful in gluten² associated disorders, such as coeliac disease, and wheat allergy. These are also used as bird and animal feed. These coarse grains also categorised as C4 plant having good water using efficiency and also survive at high temperature. Japanese millets (*Echinochloa esculenta*) are considered best for grazing.

Today, world is facing a great nutrional challanges due to land exploitation, scanty irrigation, low fertility, extended dryland due to climate crisis³. Techology and research innovations in agriculture arena enhanced the production but saline soil, water scarcity,

low fertility due to excessive use of fertilisers and pesticides led the declined crop production around the world. Hunger is the big challenge today. 815 million population is facing it. Looking such scenario sustainable crop substitution is required. Cultivation of millets may be the right choice to attain food security¹. Millets nutrients are considered to be superior in comparison to wheat, rice, maize etc. 50% calorie intake is fulfilled by these conventional crops. Millets can be cultivated in low fertile soil with PH from acidic to basic (4.5-8.0) level. Millets require low water with less maturation time (45-70 days half of rice). C₄ crops absorb more CO₂ thus reducing climate severity.

Material and Method -

Deep literature survey and various researches on millets reveal the following facts.

Millets are considered to be the super food owing to the presence of gluten free protein with high fibre content, low glycaemic index and other bioactive contents. Average carbohydrate content varies from 56-72%, protein 10-11%, rich in methionine, valine and lysine amino acids. Barnyard millet is richest source of crude fibre 38%. Calcium content of finger millet is eight time higher than wheat. Iron content in barnyard millet is 17.5 mg/100g. Fox tail contains 4.1 mg/100 zinc. Millets are good sources of β carotene, Vitamin B riboflavin, niacin, thiamine and folic acid along with phenolic compounds. Today these are frequently used as bread, biscuits, snack foods, multigrain flour etc.

Health Benefits of Millets⁴ -

1. **Weight Loss:-**

They contain low calorie hence good for weight loss.

2. **Blood sugar :-**

Due to low glycaemic index millets intake lowers the blood sugar level.

3. **Low cardiovascular risk :-**

Potassium content regulates blood pressure also reduces cardiovascular risk.

4. **Digestion :-**

Rich fibers relieves from bloating, gas, constipation and colon cancer.

5. **Antioxidant property.**

As millets contain minerals, vitamins and polyphenols these act as excellent antioxidants.

One cup (174g) cooked millets Provide protein 6.1g, carb. 41.2g, fat 1.7g and fibres 2.3g⁵ P 25% DV, mg 19% DV, Folate 81.0 DV and iron 6% of DV (daily value).

Nutritional Value per 100gm (in g)^{6,7}

	Protein	Carb	Fat	Minerals
wheat	11.8	71.2	1.5	1.5
Rice	6.8	78.2	0.5	0.6
Finger	7.3	72	1.3	2.7
Sorghum	10.4	70.7	3.1	1.2
Pearl	11.8	67	4.8	2.2
Foxtail	12.3	60.2	4.3	4.0
Kodo	8.3	65.9	1.4	2.6
Proso	12.5	70.4	1.1	1.9
Barnyard	6.2	65.5	4.8	3.7

Result and Discussion -

Above data and studies clearly reveal that millets can be an appropriate substitutes for the conventional food grains in future in some parts of the world due to their C₄ characters. These can be cultivated in low fertile and saline land with least water availability. Millets may be the part of our healthy diet. Due to the richest source of fibres and gluten free protein, these may be an ideal diet for those suffering from indigestion, colon cancer or cardiac disease. Owing to low glycemic index and low cardiovascular risk, millets flour is being used world wide as cookies, biscuits, bread and snacks. In spite of being a major foods of tribal community it may be an integral part of our diet soon.

Conclusion -

Although millets will be right alternatives of the staple cereals, of course receiving more attention for genetic and genomic studies. But high resolution forward and reverse genetic studies are yet to be applied due to lack of complete and annotated genome sequence for many millets. Foxtail and finger millets have an annotated genome sequence. Therefore more systematic studies are still required to become a substitute for traditional cereals.

References -

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