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Short Review

Health benefits of Millets

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Abstract

Millets are the traditional staple food of the dry land regions of the world. In India, millets are grown on about 17 million ha with annual production of 18 million tonnes and contribute 10 percent to the country's food grain basket. They are nutri- cereals which are highly nutritious and are known to have high nutrient content which include protein, essential fatty acids, dietary fibre, B-Vitamins, mineral such as calcium, iron, zinc, potassium and magnesium. They help in rendering health benefits like reduction in blood sugar level (diabetes), blood pressure regulation, thyroid, cardiovascular and celiac disease.

Introduction

Millets are a group of cereal grains that belong to the Poaceae Family, commonly known as the grass family. It grows in hot countries and produces very small seeds. The seeds are used as food, mainly to make flour and also to feed to birds and animals. Millets are formed important parts of the prehistoric diet in Indian, Chinese, Neolithic and Korean Mumun Societies. Millets (Jowar, Bajra, Ragi) are the oldest food items known to mankind. Coarse cereals are the earliest crops that were cultivated in India. Many such evidences have been found, which show that millets were eaten during the Indus Valley Civilization. It is widely consumed in developing countries throughout Africa and Asia. While it may look like a seed, millet's nutritious profile is similar to that of sorghum and other cereals. The annual harvest of Sorghum is twice the number of other millets. Of these Pearl Millet is the most common. Pearl Millet and Sorghum are important crops in India and parts of Africa.



“Millets are incredibly ancestral crops with high nutritious value. Millets can play an important role and contribute to our collective efforts to empower smallholder farmers, achieve sustainable development, eliminate hunger, adapt to climate change, promote biodiversity and transform agrifood system.”

Millets may have been consumed by humans for about 7,000 years and potentially play a pivotal role in the rise of multi-crop agriculture and settled farming society. Since Millets are the cheapest, widely available sources of energy, their contribution to energy intake is the highest among the poor income families and it decreases with increasing income. Millets including ragi are rich in minerals and fibre.

Sorghum, Pearl Millet, Finger Millet are major millets while Minor Millets are Foxtail, Little Millet, Kodo, Porro, Barnyard Millet etc. Inclusion of some amount of millet in a diet will help in making up deficiency of some of these minerals i.e., calcium and iron in the diet and in providing bulk(fibre) to diet, especially the rice-based ones. It must be pointed out that these millets are also rich in phytate and tannin and hence interfere with mineral availability. A balance has to be struck between the positive and negative aspects of nutritional quality of millets.

Health Benefits of Millets: - Diabetes Mellitus:

Foxtail Millet: - The aqueous extracts of foxtail millets have excellent anti- hyperglycaemic activity (Sireesa *et al.*,2011).

Finger Millet: -Finger millet-based diets have shown lower glycaemic response due to high fiber content and also alpha amylase inhibition properties which are known to reduce starch digestibility and absorption (Kumari and Sumathi, 2002). It has shown significant results in dermal wound healing process. As shown in few studies done on rats which also showed that it improves antioxidant status and controlled blood sugar levels (Rajasekaran *et al.*, 2004).



Pearl Millet: -Pearl Millets are known to increase insulin sensitivity and lower the level of triglycerides. Pearl Millet is very effective for controlling the diabetes.

Because of its high fibre content, it digests slowly and



releases glucose into the blood at a slower rate as compared to other foods. This effectively helps in maintaining the blood sugar level constant in diabetes patients for a long period of time.

Proso Millet: -Proso millet had shown to improve the glycaemic responses and insulin in genetically obese type 2 diabetic mice under high fat feeding conditions (**Park *et al.*,2008**).



Sorghum: -It contains soluble digestible starch, which is favourable for dietary management and also for metabolic disorders such as diabetes and hyperlipidemia (**Asp, 1994; Wursch ,1997**). It is rich in dietary fiber and low glycemic index, which helps in prevention and control of type 2 diabetes.



Kutki Millets (Little Millets)

It helps in keeping the heart healthy. Suitable food for people suffering from diabetes. Prevents uncontrolled increase of sugar in the blood.

Cardiovascular Diseases

Sorghum: -Empirical evidences (Slavin,2003 and 2004) suggest that regular consumption of whole grains reduces the risk of CVD (Anderson and Hanna,1999). A long prospective study by Heidemann *et al.* (2008) showed that regular consumption of balanced diet which includes whole grains, vegetable, fruits, fish and poultry diet reduce the risk of CVD and total mortality.

Pearl Millet: -The lignin and phytonutrients in millet act as strong antioxidant thus preventing heart related diseases. This is why, pearl millet is considered good for heart health. It has beneficial effects on the management and helps in prevention of hyperlipidemia and the risk of CVD. It is also helpful in weight loss, BMI and high blood pressure.

Finger Millet: - Finger millet and porso millet prevent cardiovascular disease by reducing plasma triglycerides in hyperlipidaemic rats (**Lee *et al.*,2010**)

Sanwa: - Iron is found in abundance. So, it is effective in increasing blood in the body.

Kodo: -It is helpful in strengthening the nervous system.



Anti-carcinogenic properties

Sorghum: -Anti-carcinogenic properties of sorghum have been well documented. In Vivo and in Vitro studies have shown consumption of sorghum has positive health impacts on cancer. The polyphenols and tannins present in sorghum have anti-mutagenic and anti-carcinogenic properties (**Grimmer *et al.*, 1992**)

Good for bone health

Foxtail Millet: -It also contains sufficient amount of calcium, strengthens bones and also helps in prevention of osteoporosis diseases.

Ragi: -It is helpful in bone development as it is rich in calcium and removing anaemia in the body.

Conclusion

Millets are still the staple food for millions of poor people in Africa and Asia. Millets have good grain qualities suitable for processing. Like many other cereals, millets are high carbohydrate energy content and nutritious, making them useful components of dietary and nutritional balance in foods. Combination of millets with other sources of proteins would compensate the deficiency of certain amino acids such as lysine. Successful improvement of these attributes would be a crucial key to expand the spectrum of applications of millet grains. Future trends should focus on the millet consumption in the developed countries that could help its industrial revolution.

NUTRITIONAL VALUE OF MILLETS

(In 100 gm edible portion)

MILLETS	ENERGY (KCal)	PROTEIN (gm)	FAT (gm)	CALCIUM (mg)	IRON (mg)	DIETARY FIBER (g)
MAIZE, DRY	342	11.1	3.6	10	2.3	2.7
JOWAR (SORGHUM)	349	10.4	1.9	25	4.1	1.6
RAGI (FINGER MILLET)	328	7.3	1.3	344	3.9	3.6
BAJRA (PEARL MILLET)	361	11.6	5.0	42	8.0	1.2
SANWA MILLET	307	6.2	2.2	20	5.0	9.8
ITALIAN MILLET	331	12.3	4.3	31	2.8	8.0
KODO MILLET	353	10.6	4.2	27	0.5	10.2



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