Kshudradhanya in Daily Lifestyle w.s.r. to Millets: A Critical Review

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ABSTRACT

Nutrition is a crucial factor in both health and development. Better nutrition is linked to stronger immune systems, safer pregnancies and births, a lower risk of non-communicable diseases (including diabetes and cardiovascular disease), and longer lifespans. However, the modern style of life and eating habits contribute to poor nutrition and health issues including diabetes and obesity. Millets, which don't make you gain weight and are also incredibly nutritious, can be employed in these circumstances. A variety of small-seeded grass species called millets are widely grown as cereal grains for human and animal nutrition around the world. The bulk of the plants that are frequently referred to as millets are members of the grass family Poaceae or Gramineae. Due to its abundance in protein, fibre, magnesium, phosphorus, copper, potassium, and manganese, millet is a nutrient powerhouse. The value of millets in daily life is discussed in this article. A few millet preparations are also explained in order to include them into daily life.

Key words: Nutrition, Millets, Grass, Cereals, Protein, Fibers

INTRODUCTION

Because of the nutritional variety and health benefits of millets, humankind has started to go in that direction as a result of the various new ailments that have recently been discovered. These adjusted dietary practises have made millets a part of our daily lives. Including millet in the diet is one of the dietary changes. Sorghum (Jowar), Sama (Little Millet), Ragi (Finger Millet), Bajra (Foxtail Millet), Variga (Proso Millet), Gavedhuka (Adlay Millet), Koradusha or Kodrava (Kodo Millet), Shyamak (Barnyard Millet), etc. are some examples of millets. Bajra and Sama both have a lot of fat, but Ragi has the least amount. Millet is widely eaten as food in rural areas. In addition to India, China, Greece, Egypt, and Africa are the main growing regions for millets. While the majority of millets are utilised as animal feed in rural regions, some varieties, such as finger millets and sorghum, are consumed. Millets are incredibly nutritious. Millets play a significant role in numerous traditional diets. Various millets are used in many Indian states. Millets have been grown for a very long time.[2] Millets are mentioned in the form of Trinadhanya and Kshudradhanya in Ayurvedic Samhitas as well. Dhanyakvarga in Charaksamhita mentions characters like Shyamak and Koradusha. In Rasa, these are Kashay and Madhura, and Sheeta is their Veerya. They are easy to digest, raise Vata, balance Kapha, Pitta, Ruksha, and Grahi and they also balance Ruksha.[3] Millets are mentioned in numerous further Samhitas. Additionally, Dhanyakvarga in Bhavprakash mentions millets such Kodo, Gavedhuka and Yavanala as well as Kshudradhanya (Kanguni, Cheerak, and Shyamak). Shudradhanya is Ushna, has

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Kashaya and Madhura Ras, Laghu, Lekhan, Vipaka is Katu, Ruksha, Vatakarakara and Grahi and it also lessens Pitta and Kapha according to Bhavprakash.[4]

Benefits of Millets

Millets are significantly superior to wheat and rice in terms of nutrients. When compared to wheat and rice, millets have a higher fibre content and a lower mineral content. All other millets also have at least twice as much calcium as rice, with finger millet having a calcium content of 30 times that of rice.[5] Beta carotene, vitamins, and other minerals are abundant in millets. The linoleic, oleic, and palmitic acids, as well as monogalactosyl, diacylglycerols, digalactosyl diacylglycerols, phosphatidylethanolamine, and other important fatty acids, are all abundant in millets. For the body to produce cellular energy, phosphorus and vitamin B components including niacin, folacin, riboflavin, and thiamine are present in millets.[6] In addition to their nutritional importance, millets have been produced for ages for a variety of additional reasons. Millets are grown without pesticides on land that is pest-free according to standard farming practises. Millets like foxtail millet function as anti-pest agents in storage conditions for pulses like green gramme because they are pest-free. Millets don’t require fumigants.[6] Millets are comparatively less important than other crops in Indian agriculture when it comes to feeding crops, but they are essential for ensuring food security at the local and farm level. Millets may thrive in regions that are prone to drought and can withstand higher heat regimes. Millets may thrive even in environments with very little rainfall and without irrigation. Millets may flourish in areas with little water. Millets’ growing season is brief. Millets mature in between 60 and 100 days. Alkali-forming cereals include millets. They support keeping the body’s pH in equilibrium. Gluten is not present in millets. Gluten sensitivity is one of the most prevalent gastrointestinal issues nowadays. Millets can therefore be provided in these circumstances.[1]

Varieties of Millets[8]

Major Millets

1. **Pearl Millets** - The most popular variety of millet is pearl millet, also known as **Bajra**. For ages, **Bajra** has been a mainstay of Indian cooking, either in the form of khichdi or as a raw ingredient for **Rotis**. Rajasthan is India’s top producer of this nutrient-rich crop due to the fact that it requires a high temperature to grow. This uncommon crop is grown during the hotter summer months because it can withstand harsh circumstances like dryness, low salinity, low soil fertility, and high pH. Magnesium, a mineral found in pearl millet, helps asthmatics breathe easier and decreases the impact of migraines. Gallstone incidence is reduced in part due to the fibre in pearl millets.[9],[10]

2. **Finger Millet** - **Ragi**, also known as finger millet, is most often farmed in Ethiopia, Ethiopia, and Sri Lanka. This superfood’s ingredients enhance digestion, slow the ageing process, and reduce the risk of heart disease. The popularity of **Ragi**, a staple of Indian cuisine for many years, declined as the prevalence of wheat and rice increased. But when UN FAO emphasised the need of millet consumption for reducing malnutrition and other illnesses, it began to make a comeback. Natural calcium found in finger millet helps to build bones and reduces the risk of bone fractures. Iron that occurs naturally in it also aids in the treatment of anaemia. Finger millet is advantageous for small children, the elderly, and expectant mothers since it is high in calcium. It facilitates lactation in moms.

A. Minor Millets

1. **Foxtail Millet** - sometimes referred to as **Kangu**, is a type of millet that was first cultivated in northern China and India. Given that it resembles a tapering cluster of flowers, it gets its name. This dry crop is sown around the last week of May and can take up to 70 days to mature. Foxtail millet assists in the continual release of glucose without affecting the body’s metabolic process. Foxtail millet is regarded as a heart-healthy food and aids in reducing the incidence of diabetes in society because of its high magnesium content.[10],[11]

2. **Proso Millet** - Also referred to as **Cheenak**. Pellagra is brought on by a lack of niacin, a type of vitamin
B. Cheenak/Cheena - (Indian millet, also known as proso millet; Panicum miliaceum) Other Guna and Prayog include Brumhana (nourishes bodily tissues), Guru (heavy for digestion), Durjara (difficult for digestion), and Bhagnasandhanakara (facilitates fracture repair).

C. Shyamak/Sawa - (Barnyard millet, Echinochloa frumentacea) Pittaj Vikara and Vibandha use Shyamak Panchang among other Guna and Prayog. It is also referred to as "poor people's cereal." It is also Dhatu Shoshak (dries the body tissues) and Sangrahi (absorbs excess fluids and aids in regular faeces formation).

D. Kodrava/Koradusha - (Kodo millet, Paspalum scrobiculatum) Other Guna and Prayog include Vishahara (excellent food for wounds and ulcers), Avrishya (anaphrodisiac), Guru (heavy for digestion), Pathya in Vrana (excellent food in wounds and ulcers), Madhura-Tikta Rasa, and Guru (absorbs excess fluids and aids in regular faeces formation). Diabetic patients can also be fed it in place of rice.

E. Gavedhuka - (Adlay millets: Coix lacryma) Katu - Madhura Rasa, Karshyakaari (emaciating), and Kapha Hara (Decreases Kapha Dosha) are additional Gunas and Prayogs. It is said that other qualities resemble Shyamaka. Gavedhuka is employed in Mutra Krich because it possesses characteristics similar to those of the diuretic/Mutral. This plant’s roots are employed in the treatment of dysmenorrhea, or Pidita Artava. This grain is used to make chapati, which aids in weight loss.

F. Yavanala - (Jowar or Sorghum vulgare) Ruchya (improves taste perception), Trishnaghna (reduces excessive thirst), and Kledaghna (reduces excessive moisture content) are additional Guna and Prayog. Additionally, it possesses aphrodisiac qualities somewhat similar to Vrishya and Mutrajanan (Urogenesis).

G. Nartaki - (Ragi/Finger millet, Eleusine coracana) Tikta-Kashay-Madhura Rasa, Sheeta (cool in potency), Snigdha, Balya (promotes strength), and
**DISCUSSION**

The least allergenic and most easily digestible foods are millets, which are regarded as one of the finest foods for those with gluten sensitivity. Millets are essential crops in semiarid and tropical regions of the world due to their short growing seasons, resistance to pests and diseases, and productivity in hot and dry climates when primary cereals cannot be relied upon to generate yields that can be sustained. They are typically eaten by the less fortunate members of the community as foods that promote health and energy. In terms of their protein, carbohydrate, and energy content, millets have nutritional potential that is comparable to that of popular cereals like rice, wheat, and barley. The inclusion of phytochemicals including dietary fibre, tocopherols, and phytosterols as well as an abundance of specific minerals, vitamins, trace elements, vital fatty acids, and amino acids is usually what causes the majority of the millet’s health benefits. Millets typically possess qualities that allow them to be awarded Kaphaj, Pittaj, and Raktaj Vyadh, according to Ayurvedic scriptures. Millets shouldn’t be given to Vataj Vyadh patients since they enhance Vata Dosha. Although each millet’s specific indicators are not given, they can be deduced by looking at its Guna (properties) and Karma (Actions).\(^1\)

1) **Kangu (Foxtail Millet)** - Since Kangu millet is Sangrahi, as was previously mentioned, it can be indicated in both Grahani (sprue) and Atisara (diarrhoea). Kangu can be used for Dhatu Shoshana (reduction of bodily tissues) of over nourished Dhatus like Meda (adipose tissue) and Mamsa (muscular tissue) while also nourishing the body by providing micro-nutrients because it is both Brumhana (nutrition) and Shoshana. This idea works effectively when dealing with issues like Sthoulya (fat) and Prameha (diabetes). Kangu is a Bhagnasandhankarak, therefore it is indicated in Bhagna (fractures) and in circumstances like Kapha-Pitta Pradhan Twaka Vikara and Amavata based on its Guna and Karma.\(^\[1\],[16]\) Foxtail millets’ aqueous extracts have outstanding anti-hyperglycemic action.\(^\[17\]\)

2) **Cheenak (Proso Millet)** - As previously mentioned, Cheenaka is advised for Santarpana Janya Vyadhi, or diseases brought on by excessive nourishment of body tissues, such as Sthoulya (obesity), Prameha (diabetes mellitus), and Medoroga (diseases brought on by excessive lipids), because it has properties like Guru, Ruksha (reduces unctuousness), Kapha Hara, and Brumhana.\(^\[1],[18]\) Diabetes mellitus and cardiovascular disorders are two ailments for which proso millet is recommended. In genetically obese type -2 diabetic mice fed Proso millet, plasma levels of adiponectin and high-density lipoprotein (HDL) cholesterol improved under high-fat circumstances. Under high-fat feeding conditions, proso millet has been demonstrated to enhance glycemic responses and insulin in genetically obese type 2 diabetic mice.\(^\[19\]\)

3) **Shyamak (Barnyard Millet):** Indications for Shyamaka (Barnyard Millet) include Atisara (Diarrhea), Grahani (Sprue) as it is Sangrahi, Badda Vikara (compactness of faeces), Santarpana Janya Vyadhi, including Sthoulya, Prameha (Diabetes Mellitus), Medoroga (Diseases caused by excessive lipids) as it has Guru like Shoshana (dries up excessive moisture), Ruksha, Baddha Mutrakara, Lekhaniya.\(^\[20\]\) Barnyard millet is indicated in conditions like Cardiovascular diseases, Diabetes mellitus. Rats fed with a diet of treated starch from barnyard millet had shown to lower blood glucose, serum cholesterol, and triglycerides compared with rice and other minor millets.\(^\[21\]\) Barnyard millet has been reported to be beneficial for type 2 diabetics, especially the dehulled varieties, as the glycemic index for dehulled millet (50.0) and heat treated was 41.7.\(^\[1],[22]\)

4) **Kodrava / Koradusha (Kodo Millet) -** As mentioned before Koradusha/Kodrava (Kodo millet) is recommended for Grahani (Sprue) due to Param Grahi (absorbs excessive fluids and helps for normal formation of feces and enhances...
digestion), Badda Vikara (compactness of feces), Vrana (Wound and ulcers), and Santarpana Janya Vyadhi like Sthoulya (Obesity), Prameha (Diabetes Mellitus), Medoroga (Diseases due to excessive lipids) due to Kleda Shoshana (Dries up excessive moisture), Ruksha (Reduces unctuousness), Lekhana (scraping), Vatarakra (Increases Vata), due to Pitta-Rakta Shamaka (Pacifies vitiated Pitta and Blood), Vishartha (Affected due to poison) as it is Visha Hara (Pacifies effects of poison) and other Kapha-Pitta Pradhana Roga.\textsuperscript{[1],[2]} Kodo millet significantly decreases glycated haemoglobin levels, promotes the production of liver glycogen, and immediately boosts energy levels in diabetics. Strong antioxidants can be found in astonishing quantities in Kodo millets. This little millet contains phenolic compounds that lower LDL, or bad cholesterol, protect the heart, lower blood pressure, and prevent a number of other chronic diseases. These anti-oxidants also function to prevent the damage that free radicals do to tissues and cells, which includes cancer. Kodo, a fantastic substitute for rice and wheat, aids in weight loss by promoting metabolic activity and preventing metabolic syndrome. Kodo millets are suitable for gluten-intolerant people because they are free of gluten. For postmenopausal women exhibiting symptoms of cardiovascular disorders, such as high blood pressure and high cholesterol levels, regular ingestion of kodo millet is particularly advantageous.\textsuperscript{[10]}

5) Gavedhuka (Adlay Millets) - Gavedhuka can be particularly helpful for Sthoulya (obesity), Sthula Pramehi (diabetes mellitus leading to overweight), and other Kapha Pradhana Vyadhi (Kapha-related diseases), as it is Karshyakaari (impairs weight loss), and Kapha Hara (pacifies Kapha), as was previously mentioned.\textsuperscript{[24]} Diabetes, rheumatism, and other conditions were cited as uses for Adlay millet.\textsuperscript{[25]}

6) Yavanaala (Sorghum/ Jowar) - As mentioned before Yavanaala (sorghum) is best advised in Raktapitta (Bleeding disorders), Amlapitta (Gastric disturbances), Twak Roga (Skin diseases) as it is Pittaghana (Pacifies vitiated Pitta), Rakta Shamaka (Pacifies vitiated Pitta), Trishna (Thirst), Sthoulya (Obesity), Prameha (Diabetes Mellitus) as it is Tikta-Kashaya in Rasa, Trishnaghna, Kaphahara.\textsuperscript{[12]} Because of certain characteristics, sorghum is good for consumption by those with chronic illnesses. Each sorghum nutrient has a unique nutritional role that may help to prevent and manage certain lifestyle diseases and disorders.\textsuperscript{[10]} Sorghum’s health advantages include:

a) Celiac disease (CD) - one of the most common hereditary illnesses, produces reactions in people with certain genetic predispositions to the gluten proteins found in wheat and other cereals. This illness is brought on by the immune system's adverse reaction to gluten and can cause acute stomach pain. Sorghum doesn't contain gluten, thus it can be a safe diet choice for persons with celiac disease. Sorghum products were unable to alter the level of anti-transglutaminase antibodies when consumed continuously.\textsuperscript{[27]}

b) Obesity - In India, obesity is a growing issue and is positively correlated with several chronic illnesses, such as diabetes and cardiovascular disease (CVD). Evidence from experiments suggests that consuming more dietary fiber reduces the prevalence of obesity.\textsuperscript{[28],[29]} Foods high in dietary fiber enhance the function of the large bowel and slow down digestion and absorption, lowering the risk of chronic diseases.\textsuperscript{[30],[31]} Sorghum has special chemical and physical properties (bulk to the diet, viscosity, water holding, and absorption capacity), which control the consequent physiological behaviour. It is also high in dietary fiber. It contributes to hunger satisfaction, heightens satiety, and lowers risk factors for obesity.

c) Diabetes Mellitus - is a serious metabolic condition that affects many nations. Whole grain-rich diets typically boost HDL cholesterol while lowering LDL cholesterol, triglycerides,
and blood pressure.[32] Boiling Yellow Jowar flour (coarse) resulted in a lower glycemic index than flour made from the same variety, according to studies on the processing and cooking of white and yellow jowar kinds. Similarly, chapati prepared from white Jowar flour showed a low glycemic index over yellow Jowar flour. These changes in the glycemic index due to processing and cooking play an important role in diets followed in the dietary management of diabetes.[33]

d) **Coronary Heart Diseases** - Empirical data[34],[35] and indicate that regular whole-grain consumption lowers the risk of CVD.[36]

e) **Cancer** - Sorghum’s anti-carcinogenic properties have a long history. Studies conducted in vitro and in vivo have demonstrated the protective effects of sorghum consumption against cancer. Sorghum contains polyphenols and tannins that can inhibit the growth of cancerous and mutagenic cells in humans as well as promote the production of melanin.[37],[38]

f) **Nartaki (Ragi/Finger Millet)** - Nartaki (Finger millet) can advise in Raktaapitta (Bleeding disorders), Amlapitta (Gastric disturbances), Twak Roga (Skin diseases), as it is Tikta-Madhura (Bitter-Sweet), Kashaya Rasa (Astringent taste), Sheeta (cold in potency), Snigdha Gunayukta (Property of Unctuousness), Durbala (Loss of energy) due to Balya Karma (helps to improve energy), Sthoulya (Obesity) and Prameha (Diabetes Mellitus) as it is Tikta-Kashaya (Bitter and Astringent in taste) & Balya (Increases strength and energy).[1] In terms of nutrition, finger millet is a good source of vitamins, minerals, and fibre, particularly calcium. Benefits of finger millet for health.[19] Finger millet is very nutrient-dense and offers a number of health advantages. Below is a list of finger millet’s nutritional information. Using finger millet or *Ragi* to lose weight Tryptophan, an amino acid found in *Ragi*, reduces hunger and aids in weight management. *Ragi* gets digested at a slower rate thus keeping one away from the intake of excessive calories. Also, fibers present in *Ragi* give a feeling of fullness thus controlling excessive food consumption. Finger millet/ *Ragi* for bone health: *Ragi* is rich in Calcium which helps in strengthening bones. It is an excellent source of natural calcium for growing children and ageing people.

*Ragi* consumption helps in the development of bones in growing children and the maintenance of bone health in adults. *Ragi* keeps diseases such as osteoporosis at bay and could reduce the risk of fracture. Finger millet/ *Ragi* for diabetes: Finger millet’s phytochemicals help in slowing the digestion process. This helps in controlling blood sugar levels in the condition of diabetes. In a study conducted in 2000, it was found that a Finger Millet based diet helps diabetics as it contains higher fiber than rice and wheat. Also, the study found that a diet based on whole-finger millet has a lower glycemic response i.e., lower ability to increase blood sugar levels. This is because Ragi flour contains components that reduce the starch’s ability to be digested and absorbed.

Finger Millet/Ragi for lowering blood cholesterol: Finger millet contains the amino acids lecithin and methionine, which aid in lowering cholesterol levels by removing extra liver fat. For anaemia, use finger millet or *Ragi* because it contains a lot of natural iron. Consuming *Ragi* benefits anaemia patients.

*Ragi* or finger millet for relaxing You can ingest *Ragi*, a natural sedative. It helps with anxiety, depression, and insomnia (nights without sleep). *Ragi* can help with migraines as well. Various ways to consume millet: Millets are incredibly healthy, although their flavour isn’t as wonderful as that of other cereals. There are numerous ways to prepare and consume these millets. The following list includes a few methods of consuming millet. Millets can be used in a variety of ways in our daily lives. Millet-based breads are healthier than traditional breads. It is possible to make millets *Laddooos* with flax seeds and dry fruits. Foxtail millets...
can be used as a substitute for rice in the Indian dishes Sweet Pongal and Bisibelebhath.

You can also use other millets in place of rice in kheer and mango rice, such foxtail millets, barnyard millets, proso millets, and small millets. Various millets can also be used to make pancakes, Dosas, and Idlis. In this way, millet can be used to make a variety of delectable, wholesome, and healthful meals. In this sense, a sedentary lifestyle can nonetheless contribute to a healthy life.

You may make Upma, Sweet Halwa, Barfis, and veggie Pulaao with a variety of millets.

All of the meals are incredibly nutritious and healthy. You may prepare chapatis with Bajra, Sorghum and Ragi that are high in fibre and simple to digest. Obese and diabetic people can specifically receive these chapatis. Children can also eat millet porridge with fruits and dry fruits. Children can enjoy millet-based cakes and biscuits that are highly nourishing and healthy.

You can also make cutlets, Dhokla, and many varieties of rice. Puffed or roasted millets can also be made.

**CONCLUSION**

In today's fast-paced world, everyone favours fast food, which leads to malnutrition. Malnutrition can result from either over or undernourishment. There are several health advantages to including millet, an ancient, prized grain-like seed, in our daily diet. The Santarpanajanya Vikaras (diseases caused by overeating) and Kapha-Pittaja Vikaras (induced by the emergence of non-communicable diseases brought on by the sophisticated sedentary lifestyle) are the conditions when millets are most beneficial. A healthy lifestyle involves including millet in the diet and avoiding refined foods like rice, wheat, refined flours, processed meats, refined oils, packed & ready-to-eat foods, and milk. Because millets contain equal amounts of protein, carbs, and calories as typical cereals like rice, wheat, and barley, they have similar nutritional potential. The quantity of specific minerals, vitamins, and trace elements in millet, together with the presence of phytochemicals like polyphenols, tocopherols, phytosterols, and dietary fibre, are generally responsible for the majority of the grain's health benefits. Numerous epidemiological studies have found a link between frequent consumption of millet grains and their derivatives and a lower risk of developing chronic diseases like diabetes, heart disease, cancer, and all-cause mortality.

Therefore, by adjusting their diet and increasing their daily intake of a wide variety of fruits, vegetables, and millet grains, consumers can enhance their health and reduce their risk of contracting chronic diseases. Millets can be incorporated into a diet by preparing a range of delicious and healthful foods. Millets are among the healthiest meals, but many still consider them to be a poor man's meal. For these reasons, it is important to apply standardisation processes and processing technologies to enable the widespread use of millet products. Finally, it is important to sell these products in a way that makes everyone aware of the value of millet.

**REFERENCES**


11. O.S.K. Reddy, Smart Millet, and Human Health, Green Universe Environmental Services Society.2017

12. Jana Kalinova, nutritionally important components of Proso millets (panicum miliaecum L.) food 1(1), 91-100 global science books.


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