

Role of Millets (*Kshudra Dhanya*) In Achieving Sustainable Development Goals (SDG) Environment and Health Issues (Review Article)

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Submitted: 05-10-2023

Accepted: 15-10-2023

ABSTRACT-With the rapidfire profitable development and extending westernisation of lifestyle in the past few decades, lifestyle diseases are characterised by the imperfect daily diet with regard to diet and culture. The frequency of these conditions has recently reached alarming proportions among Indians. The biggest contributors to unhealthy lifestyle conditions were poor dietary practises such consuming junk food and bakery products like cookies and bread. Ayurveda provides nutrition management and lifestyle recommendations to manage lifestyle diseases, while Indian millets are unutilised and hindering SDGs.

METHODS- All information will be compiled using a variety of Samhitas, electronic journals, sources about current Ayurvedic research, web searches and other publications, among other things.

RESULTS- Small grain cereals known as *Kshudra Dhanya* have been consumed as food by humans for generations. Millets are a common name for them. *Kshudra Dhanya*(millets) are distinguishably explained in Ayurveda, along with their unique properties and effects, from which their indications and contraindications can be inferred. The following makes an effort to comprehend the characteristics and operations of with their indications, contraindications, appropriate processing, and administration. Indian millets are excellent choices for maintaining a healthy, disease-free lifestyle. It Includes *Kapha Vata Shamak*, *Katu Vipaka*, *Ushna Virya* and *Madhur-Kashaya Rasa*. It is helpful in malnutrition because of its *Bruhaniya* characteristic.

DISCUSSION- Millet is widely available and reasonably priced. Millets are packed with both major and minor nutrients, including fibre, excellent protein, fat, carbohydrates, vitamins and minerals, as well as phytochemicals and antioxidants. Antioxidants found in millet include phenolic acids and frozen flavonoids. Foods made

from millet are also regarded as possible probiotics since they may increase the probiotics' viability and increase their potential for health benefits.

KEY WORDS: *Kshudra Dhanya*, Millets, Sustainable Development Goals.

I. INTRODUCTION: -

It is correctly said that "We are what we eat". The food or the daily diet we consume is source of nutrients and energy that is needed for each cellular activity, immune function, gene expression and eventually the overall health. Ayurveda has incorporated these basic facts about the *Aahara* or nutrition and its application in the maintaining of health and preventing diseases. It is rightly stated that-

आहारसम्भवंस्तुरोगाश्चाहारसम्भवाः।

हिताहितविशेषाच्चविशेषःसुखदुःखयोः॥

(Cha.Su.28/45)

The existence of all living things, according to Ayurveda, is the result of *Aahara* and the *Roga*, are also the results of *Aahara Sevana*. Food can bring us happiness or sadness, depending on how wholesome it is. This is the rationale for including *Aahara* in the *Trayopastambha*, ("Three pillars of life") framework. No matter if someone has a sickness or disability, the importance of nourishment cannot be understated. As described by the principles of Ayurveda and evolution in contemporary science that support the claims of Ayurveda, this review will attempt to manifest the significance of nutritional support of millet in the form of *Aahara*¹.

Thus, the fundamentals of *Aahara* are discussed in the first two chapters of the *Swasthya Chatushk*(group of chapters highlighting the significance of preventive measures for health), where *Matrashitiya*(Cha.Su.5) discusses the significance of balanced and adequate nutrition, *Tasyashitiya Adhyaya* (Cha.Su.6) discusses the seasonal diet regimen and *Satmya Kalpana* led to

Aahara. The study of diet is covered in-depth in an entire *Chataska* (group of four chapters presenting a related topic) titled *Annapana Chatushka*, where the significance of diet, the classification of dietary food groups and the effects of eating an imbalanced diet are all properly described. *Rasavimana Adhyaya* (Cha.Vi.1) elaborates on it further in the first two chapters of *Vimanasthana*, where he explains the rationale behind the characterisation of *Aahara* and *Ashtau-Aahara*. Millets are essential for a healthy lifestyle².

International Year of Millets: Unleashing the potential of millets for the well-being of people and the environment UN dedicates 2023 to greater efforts in producing millets given their nutritional properties and resilience in adapting to climate change³.

Structure of Millet grain- Bran-The grain's multilayered outer skin serves as a shield against sunlight, pests, water and disease for the other two components of the grain. Iron, zinc, copper, magnesium, B vitamins, fibre and phytonutrients are among its significant antioxidants.

Germ- The embryo, which will grow into a new plant if pollen fertilises it. It includes unsaturated fats, vitamin E, antioxidants, phytonutrients and B vitamins.

Drought resistant-

- Millets were primarily planted in water-scare places and were drought-resistant since they require very little water compared to other grains for their cultivation⁴.
- Millets have improved their resilience to pests and illnesses, which has reduced the burden on farmers and boosted the health benefits.
- Millets have a short growing season, maturing in 60-100 days.
- They are rich in phytochemicals and micronutrients.
- Alkaline forming grain.
- Helps to maintain the PH balance in the body.
- Gluten free- Gluten intolerance is a common gastrointestinal problem.

Endosperm-The food source for the germ, which would give the budding plant vital vitality if the grain were permitted to mature. The endosperm, which makes up the majority of the kernel is made up mostly of starchy carbohydrates, proteins and trace amounts of vitamins and minerals.

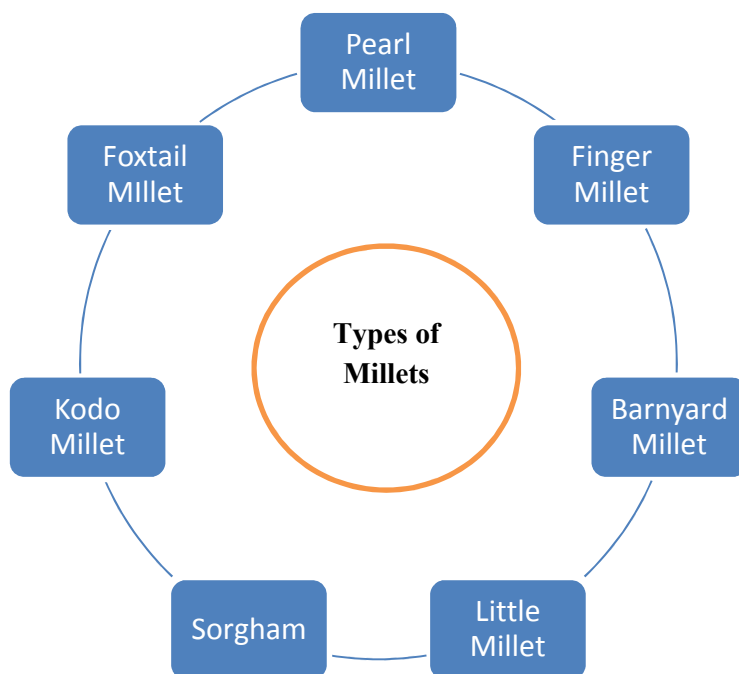
Millets are classified under *Dhanya Varga* and have various Guna and Karma qualities and effects.

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|---------------|--|
| <i>Rasa</i> | <i>Kashaya-Madhura</i> |
| <i>Vipak</i> | <i>Katu</i> |
| <i>Veerya</i> | <i>Ushna</i> |
| <i>Guna</i> | <i>Laghu, Ruksha</i> |
| <i>Karma</i> | <i>Lekhana, Vrishya, Kledashoshana, Baddhamalakara</i> |

Actions on the *Doshas*: raises *Vata*, raises *Pitta* and balances the *Kapha*.

The following are list of millets: Other than its general characteristics, millets unique and distinctive qualities include-

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|--|-----------------------------------|
| <i>Kangu (Priyangu)</i> - Foxtail millet | <i>Shyamaka</i> - Barnyard millet |
| <i>Koradusha (Kodrava)</i> - Kodo millet | <i>Cheenaka</i> - Proso millet |
| <i>Nartaki</i> - Finger millet | <i>Gaveduka</i> - Adlay millet |
| <i>Yavanaala</i> -Sorghum | |



1. *Kangu/Priyangu* (*Setaria italica* - Foxtail millet)⁵

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|--|
| <i>Guru</i> (heavy for digestion) |
| <i>Sangrahi</i> (absorbs excessive fluids and helps for normal formation of faeces and enhances digestion) |
| <i>Brumhana</i> (nourishes the body tissues) |
| <i>Shoshana</i> (dries up excessive moisture) |
| <i>Bhagnasandhanakrit</i> (fracture healing) |
| <i>Durjara</i> (delay for digestion) |
| <i>Vrishya</i> (aphrodisiac) |

2. *Shyamaka* (*Echinochloa frumentacea* – Barnyard millet)⁶

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|--|
| <i>Sangrahi</i> (absorbs excessive fluids and helps for normal formation of faeces and enhances digestion) |
| <i>Dhatu shoshaka</i> (dries up the body tissues) |

3. *Koradusha/ Kodrava* (*Paspalum scrobiculatum* -Kodo millet)

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|--|
| <i>Madhura-Tikta rasa</i> (sweet-bitter in taste) |
| <i>Guru</i> (heavy for digestion) |
| <i>Param Graahi</i> (absorbs excessive fluids and helps for normal formation of faeces and enhances digestion) |
| <i>Vishahara</i> (anti-poisonous) |
| <i>Avrishya</i> (Antaphrodisiac) <i>Pathya in Vrana</i> |

4. *Cheenaka*(*Panicum miliaceum*- Proso millet)⁷

| | |
|--|--|
| <i>Guru</i> (Heavy for digestion) | <i>Brumhana</i> (nourishes the body tissues) |
| <i>Durjara</i> (difficult for digestion) | <i>Bhagna sandhanakara</i> (promotes fracture healing) |

5. *Nartaki*(*Eleusinecoracana*–(Finger millet)⁸

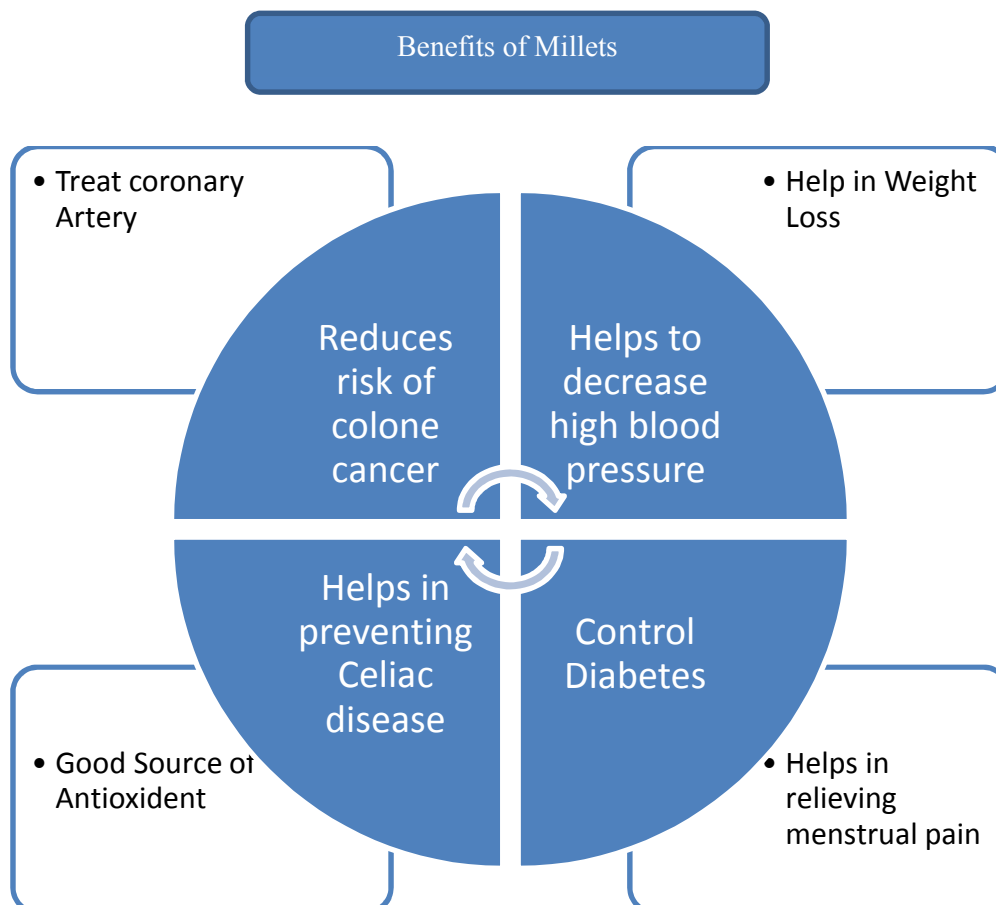
| | |
|--|----------------------------------|
| <i>Tikta, Madhura</i> and <i>Kahaya Rasa</i> (bitter-sweet-Astringent in taste) | <i>Sheeta</i> (cold in potency) |
| <i>Snigdha</i> (unctuousness) | <i>Balya</i> (promotes strength) |
| | <i>Vrishya</i> (aphrodisiac) |

6. *Gaveduka* (*Coixlachrymajobi*–(Adlay millet)

Katu-Madhura Rasa, which has a pungent-sweet flavour *Karshyakaari*(thin) (Calms *Kapha Dosha*) *Kapha Hara Sangrahi* is reported to possess qualities that are comparable to those of *Shyamaka*, including the ability to absorb excess fluids, aid in the normal creation of stools and improve digestion, (Dries the tissues) *Dhatu Shoshaka*⁹.

7. *Yavanaala*(*Sorghum vulgare* - Sorghum)

| | |
|----------------------------------|--|
| <i>Avrishya</i> (Antaphrodisiac) | <i>Trishaghna</i> (pacifies excessive thirst) |
| <i>Ruchya</i> | <i>Kledaghna</i> (pacifies excessive moisture content) |



Importance of Millets in Various Disease

When the general characteristics and effects of millets are examined, it becomes clear that millets are most beneficial for vitiation of the *Raktaj*, *PittajaRoga*, and *KaphajaRoga*. Millets must always be avoided when treating *VatajaRoga* (diseases caused by *Vata*), as they make the situation worse. According to this understanding,

the general indications for the consumption of millets are *Sthoulya* (obesity), *Kushta* (skin diseases), *Prameha* (diabetes), *Atisaara* (diarrhoea), *Medoroga* (diseases caused by excessive lipids), *Vrana* (wounds and ulcers) and other *Santarpanajanya Vyadhi* (diseases caused by overnutrition of single or multiple lifestyle disorders)¹⁰.

Millets- An approach for sustainable agriculture & healthy world and its securities¹¹.

| Food security | Nutritional security | Safety from diseases | Economic security |
|---|--|---|--|
| Sustainable food source for combating hunger in changing earth climate. | Rich in micronutrients like calcium, iron, zinc, iodine etc. | Gluten free: A substitute for what in celiac diseases. | Climatic resilient crop. |
| Resistance to climate stress, pests and diseases. | Rich in bioactive compounds. | Low GI: A good food for diabetic persons. | Sustainable income source for farmers. |
| - | Better amino acid. | Can help to combat anemia, cardiovascular diseases, calcium deficiency. | Low investment needed for production & value addition can lead to economic gains ¹² . |

Millets are reportedly helpful for long-term diseases like obesity and type 2 diabetes. As millets are *guru* (heavy) and *ruksha* (dry), which make them difficult (*durjara*) for simple digestion due to their higher amounts of dietary fibre, protein, and lower amounts of carbs compared to other cereals, advising millets as per individual's *Agni Bala* (Digestive Capacity) is also very significant. However, both of these traits have the added benefit of prolonged satiety and have the *lekhana* (scraping) and *kledashoshana* (drying out excess moisture) actions that are helpful in treating *SantarpanajanyaVyadhi* (diseases brought on by overnutrition of one or more tissues). Although millets are difficult to digest, they are referred to as having "*Laghu*" (Lightness) properties, which can be interpreted as meaning that when millets are properly digested, they leave the body feeling light.

II. DISCUSSION-

Millets are an inexpensive and widely accessible source of dietary fibre, carbohydrate, protein, vitamins and minerals as well as antioxidants and phytochemicals. They are also potential probiotics that can improve the viability of probiotics and have positive health benefits. Because of the increased intake of processed food and junk food, which is associated to a number of ailments, including *Rasavaha Srotodusti* and *Medovaha Srotodusti*, the significance of this review study should be recognised as an important food in the present era. Therefore, as a nutrient-

dense diet, millet may satisfy the needs of the world's population in the present era. This review study focuses on the nutraceutical advantages of millets and how they can be used as substitute cereals for therapeutic food products such high-protein, high-energy diets, gluten-free diets, CVD diets, etc.

III. CONCLUSION-

The usage of millets as "food medicine" was shown in this review study and called "smart food"¹³. Due to the progressive growth in the prevalence of *Santarpanajanya Vikara* in adults, millets are a godsend in the modern world. due to the progressive rise in adult cases of *Santarpanajanya Vikara*, difficulty weaning and late-infancy gluten sensitivities. Millets are a blessing for the modern day. The "*Aahara as Aushadhi*" approach aims to reduce reliance on medications and provide nutrition alongside treatment. Kashyapa referred to *Aahara* properly as the *Maha-Bhaishajya*, (supreme medicine). For this reason, *Aushadhi Siddha* is recommended in order to reactivate the *Agni* after the administration of *Shodhana* therapies like *Vamana*, etc. These include the *Yavagu* or rice and herb-infused pulses, which are used to cure ailments of a similar kind. Therefore, the *Sansarjana Krama* (Post Shodhana Dietary Regimen) is crucial for maintaining health and boosting the *Agni*.

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