International Research Journal of Ayurveda & Yoga Vol. 9(1), pp. 11-16, Feb , 2026
Available online at http://irjay.com
ISSN: 2581-785X
DOI: **10.48165/IRJAY.2026.90104**

Research Article

Incorporating Millets In Different Seasons According To Ayurvedic Ritu Charya

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Article Info

Article history:
Received on: 30-04-2026
Accepted on: 05-05-2026
Published on: 07-05-2026

Keywords: Millets, Ayurveda, Ritucharya, Seasonal diet, Dosha balance, Lifestyle diseases

ABSTRACT

Background: Millets, traditionally classified under *Kshudra Dhanya* in Ayurveda, are recognized for their nutritional richness and therapeutic potential. The Ayurvedic principle of *Ritucharya* emphasizes seasonal dietary adaptations to maintain Dosha equilibrium and prevent disease. Despite renewed global interest in millets as "Shri Anna," their systematic integration into seasonal dietary regimens based on Ayurvedic guidelines remains underexplored.
Objective: To critically evaluate the suitability of different millets across seasons according to Ayurvedic *Ritucharya* principles and to correlate their properties with preventive and health-promoting outcomes.
Methods: A narrative review was conducted using classical Ayurvedic texts, including *Charaka Samhita*, *Sushruta Samhita*, and *Bhavaprakasha Nighantu*, along with contemporary scientific literature on millet nutrition. Millets were analyzed based on Ayurvedic parameters such as *Rasa*, *Guna*, *Veerya*, and *Vipaka*, and their seasonal applicability was assessed in the context of Dosha balance.
Results: Millets exhibit diverse गुणात्मक (qualitative) properties influencing their seasonal suitability. Heating millets such as Bajra are beneficial during cold seasons (Hemanta and Shishira), while cooling and lighter millets like Ragi and Sama are more appropriate during warmer and humid conditions (Grishma and Varsha). Seasonal incorporation of millets aligns with Dosha dynamics, supporting metabolic balance, digestive efficiency, and prevention of lifestyle disorders such as obesity and diabetes.
Conclusion: Integrating millets into diets according to Ayurvedic seasonal guidelines provides a practical, preventive, and sustainable nutritional approach. This integrative framework bridges traditional knowledge and modern dietary science, promoting resilience against seasonal and lifestyle-related disorders. Further clinical validation is recommended to strengthen evidence-based application.

Introduction

Millets, a group of small-seeded annual grasses from the Poaceae family[1] hold historical significance as one of the earliest foods domesticated by humans and served as a staple for numerous civilisations across Asia and Africa. Substantial evidence suggests that theconsumption of millets by early human societies protected against various lifestyle diseases and cancers[2]. The etymology of the word "millet" is debated, potentially deriving from the French *mille* (meaning "thousand") due to the thousands of seeds in a handful, or the Greek *mille* (meaning "small"), with Latin references naming these plants *Millium*[3]. Millets are distinct from other cereal grains due to their smaller seeds, a characteristic noted by Macdonell and Keith in 1958[4]. The earliest references to millets appear in the

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Rigveda, with additional mentions in the *Yajurveda* and *Atharvaveda*, underscoring their deep-rooted cultural and agricultural importance in ancient India[5,6]. Ayurvedic texts categorize millets as *Kudhanya*[7], *Trin Dhanya*[8] and *Kshudradhanya*[9] under *Dhanya Verga*[10] indicating their significance in traditional dietary practices.

Millets have long been cultivated for their seeds, used as food for humans and birds[11], and at times, for hay production. These grains are integral to human history, with archaeological evidence tracing their use to the Harappan civilization and prominent mentions in the Vedic texts. Despite being dietary staples in India, millets' prevalence declined after the Green Revolution. These small-grained, warm-season cereals encompass a diversity of species,colors, and morphologies, including Bajra (*Pennisetum glaucum*), Ragi (*Eleusine coracana*), Sama (*Echinochloa frumentacea Linn.*), Kodo (*Paspalum scrobiculatum Linn.*), Neewar (*Hygroryza aristata Retz.*), Gavedhuk (*Coix lacryma-jobi Linn.*), Kanguni (*Setaria italica Linn. Beauv.*), Cheena (*Panicum miliaceum Linn.*), and Jowar (*Sorghum vulgare Pers*).

Millets are referred to as "Nutri-cereals," or "*Shri Anna*"[12] celebrated for their dense nutritional profile, which includes high levels of vitamins, minerals, fibre, protein, and antioxidants. They offer a superior micronutrient composition compared to other cereals, enhancing their value as a dietary staple. The demand for millets and their products has recently gained global momentum due to their various health-promoting properties.

As the prevalence of lifestyle-related diseases rises, there is an increased focus on nutrition and health. Adjusting dietary habits, specifically through incorporating nutrient-rich millets, has become a prominent approach to maintaining fitness and preventing illness. This dietary shift reflects a renewed appreciation for millets, both for their nutritional benefits and their historical significance as health-supportive grains[13].

Aims and Objectives

Aim

To examine the seasonal dietary recommendations for millet consumption as described in Ayurveda to enhance health, improve well-being, and prevent lifestyle-related diseases.

Objective

To identify and evaluate the properties of various millets and their suitability for different seasons, providing evidence-based guidance for integrating millets into daily diets according to Ayurvedic principles.

Materials and Methods

This review was conducted by gathering and analyzing information from classical Ayurvedic texts, scientific journals, and other relevant literature on millet nutrition and seasonal dietary recommendations. Key Ayurvedic texts, including *Charaka Samhita*, *Sushruta Samhita*, and *Bhavaprakasha Nighantu*, were referenced to identify descriptions and categorizations of millets under *Dhanya Varga*, as well as their seasonal suitability and specific properties such as *Veerya* (potency), *Rasa* (taste), *Vipaka* (post-digestive effect), and *Guna* (qualities).

Each millet variety's suitability for consumption during specific seasons was assessed based on Ayurvedic principles, as well as contemporary findings on their nutrient profiles and health benefits. Seasonal adaptation practices, known as *Ritucharya*, were evaluated for their alignment with *Dosha* balance and disease prevention. Observations from the review were synthesized to provide comprehensive guidelines on millet consumption for health promotion and disease prevention across different seasons.

Results and Observations

General Benefits of Millets

Millets have remarkable adaptability to various climates and soil conditions, making them a valuable crop in both irrigated and dryland farming. Millets have a very brief growing period, taking only about 60–100 days to reach maturity which is roughly half the time needed for rice and wheat[14] which is crucial in densely populated regions where rapid harvest cycles are advantageous. Millets also have excellent storage potential, lasting up to two years when properly stored, earning them the status of "Famine Reserves." This trait is particularly beneficial in India, where agriculture often faces unpredictable monsoon patterns.

Table No. 1 Showing Classification of Millets[15]

Major Millets	Minor Millets	Pseudo Millet
Jowar (Pearl Millet)	Kodo Millet	Rajgiri/Amaranth
Bajra (Sorghum)	Proso Millet (Chena)	Kuttu/ Buck wheat
Ragi (Finger Millet)	Foxtail Millet (Kanguni)	
	Barnyard Millet (Sanwa)	
	Little Millet (Kutaki)	

Kshudra Dhanya (Millets) in Ayurveda

In Ayurveda, millets are described under *Trayaupstambha*, or the "three pillars" of life, which includes *Aahar* (diet), *Nidra* (sleep), and *Brahmacharya* (abstinence). *Aahar*, the primary

pillar, emphasizes diet's role in health maintenance and disease treatment. Ayurvedic texts, including *Charaka Samhita*, *Sushrut Samhita*, *Vagbhatta, Bhavprakash Nighantu*, and *Kaidev Nighantu* extensively discuss millets under categories like *Trindhanya*, *Kudhanya*, and *Kshurdhanya*. Properties of millets as per Ayurveda include being *Laghu* (light) and *Ruksha* (dry), with tastes like *Kashaya* (astringent) and *Madhura* (sweet). They have a cooling effect (*Sheet Veerya*) and turn pungent upon digestion (*Katu Vipaka*), with benefits in *Lekhan* (scraping), *Vrishya* (aphrodisiac), and *Kleda Shoshan* (drying moisture).

Table No. 2: Showing Properties and Therapeutic indication of Millets according to Ayurveda[16]

S. N.	Name	Synonyms[17,18,19]	Veerya	Rasa	Properties/ Guna	Therapeutic Indication
1.	(Bajara) Pearl Millet	Bajranna, Sajak, Nalika, Neelkaran, Agraydhanya	Ushna	Madhu ra	Balya, Agnideepaka, Durjara, Ruksha	Agnimandya, Balya, Punsatvahara
2.	(Ragi) Finger Millet	Madhuli, Ragika, Nartak, Madua	Laghu, Sheeta	Madhu ra, Tikta	Snigdha, Balya, Vr-ishya	Brihana, Triptikaraka, Raktpittashamaka
3.	(Kangu) Foxtail Millet	Kanguni, Pitatandula, Vatal, Sukumar, Priyangu	Guru, Sheeta	Madhu ra, Kashay a	Sangrahi, Shoshana, Vrishya	Atisara, Grahani, Sthaulya, *Prmehahara*
4.	(Cheena) Proso Millet	Varak, Sthulkangu, Sthul Priyan-gu, Kngubhed, Marha	Guru	Madhu ra	Shlakshana, Durjara, Brumhana	Bhagnasandhanak ara
5.	Kodo (Kodo Millet)	Kodrav, Kordush, Kudyal, Uddalak Madanagraj	Sheeta	Kashay a, Madhu ra	Ruksha, Laghu, Param Grahi, Vishahara	Vrana, Madhumeha, Visha-hara
6.	(Sanwa) Barn-yard Millet	Shyamak, Shyam, Tribeel, Rajdhanya, Trinbeel, Uttam	Sheet, Snigdha, Laghu	Kashay a, Madhu ra	Sangrahi, Dhatushosha ka	Vibandha, Pitta vikara-nashaka
7.	(Jwara) Sor-ghum	Jurnahwa, Yavnal, Raktika, Krostupuccha, Sugandhika	Guru, Sheeta	Madhu ra, Tuvar	Avrishya, Ruksh, Ruchya, Laghu, Kledakara	Mutrajanana, Raktpitta, *Amlapitta*
8.	Gavedhu k (Job's tear/ Adlay millet)	Vaijyanti		Madhu r, Katu	Ruksha, Kaphnashak	Karshyakar
9.	Neevar	Trini, Aranyadhanya , Munidhanya, Trinodbhav	Sheet	Kashay a, Madhur	Laghu Snigdha, pitta nashak	

Ritu Vibhajan (Seasonal Recommendations for Millets)

In Ayurveda, the concept of *Ayana* (solstices) and seasonal adaptation (*Ritu Anusara*) guides dietary choices to maintain health across seasonal changes. The year is divided into *Uttarayana* (northern solstice) and *Dakshinayana* (southern solstice), each with three seasons:

·*Adana Kala* (receiving period - cold, dry, and light seasons): *Sisira* (late winter), *Vasanta* (spring), and *Greeshma* (summer).

·*Visarga Kala* (releasing period - warm, humid, and nurturing seasons): *Varsa* (rainy), *Sharad* (autumn), and *Hemanta* (early winter).

Table No. 3: *Ritu Anusara Kshudra Dhanya* (Seasonal Suitability of Millets)

Ritu	Dhanya Guna	Kshudra Dhanya
Adana Kala	*Snighdha* (unctuous), *Laghu* (light) and *Sheeta* (cold)	Jwara, Sama, Neewar, Ragi, Kodo
Visarga Kala	*Madhura Rasa* (sweet) and *Ruksha* (rough), U*shna* (hot)	Kodo, Gavedhuk, Ka-nguni, Cheena, Bajra, Kutaki

Table No. 4: Characteristics of Ritu and Recommended Millets

Ritu (Season)	Characteristics of Ritu	Recommended Foods	Recommended Millets
Shishira and Hemant (Winter)	Cold, dry, windy, increase in *Vata* and Kapha	Warm, oily, nourishing foods like ghee, sesame, grains, and milk	Proso Millet, Little Millet, Pearl Millet
Vasanta (Spring)	Cool, damp, *Kapha* accumulation	Light, easily digestible foods like barley, honey, bitter greens, and ginger	Barnyard Millet, Kodo Millet, Pearl Millet, Foxtail Millet
Grishma (Summer)	Hot, dry, depletion of *Kapha*, increase in Pitta	Cooling, hydrating food	Finger Millet, Sorghum, Foxtail Millet
Varsha (Monsoon)	Humid, rainy, increase in *Vata* and *Pitta*	Warm, light, slightly oily foods like rice, wheat, and soups with ginger	Foxtail Millet
Sharad (Autumn)	Warm, dry, increase in Pitta	Cooling, bitter, and sweet foods like pumpkin, ghee, and rice	Bajra, Barnyard Millet, Kodo Millet, sorghum, Foxtail Millet

Recipes of Millets for Different Seasons[20]

1. **Shishir (Winter) and Hemant (Early Winter)**
- Proso Millet (Cheena): Proso Millet Rawa Idli, Khaja, Burfi, Samosa, Payasam
- Little Millet (kutaki): Little Millet Payasam, Curd Rice, Mushroom Biryani, Pudina Rice, Tomato Rice
- Pearl Millet (Bajara): Bajara Roti with Garlic Chutney, Upma, Roti, Pakoda, Halwa, Khichidi, Thalipeeth

2. *Vasant* (Spring):
- Barnyard Millet *(Sama):* Cutlet, Pudina Rice, Payasam, Sama khichadi
- Kodo Millet*:* Upma, Methi Rice, Coriander Rice, Payasam, Kodo Millet egetable salad, Porridge
- Foxtail Millet: Foxtail millet cucumber salad, Rice, Khichadi, millet and Lentil Stew
- Pearl Millet: Millet Vegetable Salad, Millet Upama, Millet Vegetable Pancake, khichadi.

3. *Greeshma* (Summer):
- Finger Millet (Ragi): Onion Chapati, Laddu, Vermicelli Kheer, Cake, Upma, Ragi Kanji, Ragi Buttermilk Porridge, Ragi Dosha with Nariyal Chutney, Ragi vegetable Salad
- Sorghum: Jwara Upama, Dosa, Vegetable Tawa Roti, Samosa, Khichidi, Idli,
- Biscuits, Peda, Vermicelli Kheer, Sharbat, Halwa, Boondi Laddu, Uttapam, jwara vegetable Salad, sorghum biscuit.
- Foxtail Millet (Neevar/Kangu): Foxtail millet cucumber salad, Foxtail Millet Rice, Khichadi

4. *Varsha* (Rainy)
- *Foxtail Millet:* Kheer, Mango Rice, Cutlet, Vegetable Biryani, Bread, Foxtail Millet vegetable stew

5.Sharad (Autamn)
- Barnyard Millet (Sama): Cutlet, Pudina Rice, Payasam, Millet Pizza, Khichadi
- Koda Millet: Upma, Methi Rice, Coriander Rice, Payasam
- Finger Millet (Ragi); Ragi Kanji, Ragi Buttermilk Porridge. Millet Upama.
- Sorghum (Jwara); Dosa, Vegetable Tawa Roti, Upma, Khichidi, Idli, Peda, Vermicelli Kheer, Sharbat, Cake, Halwa, Uttapam, Jwara Moong Dal Soup.
- Foxtail Millet (Kangu): Foxtail millet cucumber salad, Foxtail Millet Rice, millet Khichadi

Discussion

This study explores millets as nutrient-dense, resilient crops with significant dietary and therapeutic applications, especially through an Ayurvedic lens. The Ayurvedic framework places millets within the realm of *Kshudra Dhanya*, or small grains, valued for their *Laghu* (light) and *Ruksha* (dry) qualities. These qualities, combined with cooling (*Sheet*) and mildly sweet (*Madhura*) properties, underscore millets' roles in managing specific conditions related to metabolic health, such as obesity, diabetes, and digestive disorders. Ayurveda classifies millets not merely as food but as functional grains with specific *Rasa* (taste), *Guna* (qualities), and *Vipaka* (post-digestive effect), aligning with

therapeutic needs according to an individual's constitution (*Prakriti*) and seasonal adaptations.

The seasonal guidelines presented in this study underscore the Ayurvedic principle of *Ritu Anusara* (seasonal adaptation), which emphasizes diet tailored to climate fluctuations. For example, millets with *Ushna* (hot) properties, like pearl millet and little millet, are suggested during colder months, while *Sheet* (cooling) millets, like finger millet and barnyard millet, are beneficial in warmer seasons. This dynamic approach not only enhances nutrient assimilation but also aligns with the body's adaptive needs across seasons, potentially supporting overall resilience and health.

The discussion of *Lekhana* (scraping) and *Kleda Shoshan* (drying of excess moisture) qualities further reflects Ayurveda's detailed understanding of millet benefits for managing conditions like obesity and excess *Kapha*. The classification and therapeutic uses of each millet variety highlight the need for personalized dietary interventions, as Ayurveda suggests choosing grainsbased on a person's digestive strength, metabolic status, and disease susceptibility. This perspective contributes to a broader understanding of how millets can be integrated as functional foods in modern nutrition.

In terms of contemporary relevance, the short maturation period and minimal water requirement of millets make them particularly suitable for regions facing water scarcity and climate instability, positioning them as sustainable, climate-resilient crops. The nutrient profiles of millets—rich in fiber, essential amino acids, and micronutrients—support metabolic health, making them suitable alternatives to refined grains, which lack these benefits and are linked to lifestyle diseases.

However, the challenge of broader millet adoption remains, as dietary habits in many regions have shifted toward more refined grains post-Green Revolution. Addressing this requires a two-pronged approach: raising awareness of millets' nutritional and health benefits and incentivizing their production and consumption through policy support and sustainable agricultural practices. Integrating traditional knowledge with modern dietary recommendations could bridge these gaps, allowing millets to reclaim their place as staple foods with multifaceted benefits.

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Rationality

➢ Adaptation to Body's Seasonal Needs

- ·In different seasons, our bodies have unique physiological demands. For example, in winter, when metabolic activity generally slows, millets high in complex carbohydrates (like **finger millet** and **sorghum**) provide sustained energy and warmth due to their denser nutrient content. [21,22] Conversely, during summer, lighter millets like **barnyard millet** or **foxtail millet**, which have cooling properties, help maintain digestion and hydration.[23,24]

➢ Digestive Efficiency and Seasonal Energy Requirements

- Millets, as whole grains, are often high in fiber and complex carbohydrates, which makes them "heavy" or "Guru" to digest according to Ayurveda. This is beneficial in colder months when digestive power is strong. In warm months, the body benefits from millets that require less digestive effort, helping to prevent heat buildup and reduce digestive load. [25]

➢ Agricultural Seasonality and Freshness

- Millets can be grown and harvested in alignment with different seasonal conditions, supporting the availability of fresher, nutrient-rich grains throughout the year.[26] Consuming millets seasonally ensures that they are harvested and consumed close to their peak nutritional value, which can decrease nutrient loss from prolonged storage.[27,28,29]

➢Biochemical Adaptability

- Certain bioactive compounds in millets, such as antioxidants, phenolic acids, and minerals like calcium and magnesium, have seasonally aligned benefits. For instance, finger millet, which is high in calcium, supports bone strength during winter months when physical activity often decreases. Pearl millet and sorghum contain iron and phosphorus that are beneficial for hemoglobin support during colder months when the body's circulatory demands increase.

➢Environmental Suitability and Sustainability

- Millets are resilient to various climate conditions and can grow in both irrigated and arid environments, supporting crop diversity and environmental sustainability. By consuming millet seasonally, individuals also promote sustainable agricultural practices that respect regional growing cycles, reducing the ecological impact of food production.[30]

Conclusion

This study highlights millets as nutrient-dense, climate-resilient grains with significant benefits for modern health. Ayurvedic insights classify millets with Laghu (light) and Ruksha (dry) qualities, supporting their use in managing conditions like obesity, diabetes, and digestive issues.

Additionally, their high fibre, essential amino acids, and mineral content make them a valuable alternative to refined grains, enhancing metabolic health and sustainability. Integrating Ayurvedic wisdom with modern nutrition, and promoting millet consumption can foster a balanced, sustainable diet. Future studies should explore their therapeutic potential within integrative health frameworks to reinforce their role in global health.

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