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Popular Millets-Based Recipes: Nutritional and Therapeutic Perspectives

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Abstract

This review article explores the nutritional and therapeutic potential of millet-based recipes, emphasizing their relevance in both traditional Ayurveda and modern dietary practices. Millets, small-seeded cereals including ragi, bajra, and little millet, are highlighted for their richness in fiber, minerals, and phytochemicals, making them suitable for managing iron deficiency anemia, diabetes, and obesity. The article presents detailed preparation methods for recipes such as Ragi Laddu, Bajra Laddu, Little Millet Daliya, and Finger Millet-Palm Jaggery Cookies, focusing on techniques like germination and roasting that enhance nutrient bioavailability and safety. Nutritional tables provided illustrate the carbohydrate, protein, mineral, and vitamin profiles of various grains, alongside their glycemic indices. The discussion underscores the value of millet integration into mainstream diets for combating malnutrition and non-communicable diseases, while advocating for further innovation in ready-to-cook millet products suited to contemporary lifestyles.

Key words: Millets, Nutritional benefit, Traditional recipes, Ayurveda, Iron deficiency anemia, Diabetes, Obesity, Glycemic index.

Introduction

Millets, a group of small-seeded cereals, have been vital staple foods in many parts of the world, especially in India. Traditionally valued for their nutritional richness and adaptability to harsh growing conditions, millets have gained renewed attention as functional foods with potential health benefits. With the contemporary lifestyle shift towards quick, nutritious, and convenient food options, millet-based recipes serve as promising candidates for addressing nutritional deficiencies and lifestyle-related disorders.

Background

The global food industry is increasingly emphasising innovation by integrating nutritional enhancement with convenience in ready-to-cook foods that maintain quality and shelf life. Millets, which include varieties such as finger millet (ragi), pearl millet (bajra), and little millet, are noted for their high fiber, mineral content, and beneficial phytochemicals. These grains' traditional uses span from dietary staples to therapeutic applications in Ayurveda and modern nutrition, particularly for conditions like anemia, diabetes, and obesity. This review presents detailed millet-based recipes incorporating traditional methods, emphasising their nutritional and therapeutic value.

Millet Recipes and Nutritional Details

In the evolving landscape of the food industry, the integration of innovative features into products has become a vital strategic priority. With increasingly hectic lifestyles, consumers are actively seeking ready-to-cook food options that are quick and easy to prepare, nutritionally balanced, have a long shelf life and maintain superior taste and quality. Some of the traditional foods recipes mentioned below and also explained how they help in therapeutics usage:

1. *Ragi Laddu*

Ingredients		
1	*Ragi* (Finger Milets)	**200 gm**
2	*Gud* (Jaggery)	**200 gm**
3	Water	Q.S. R

Method of Preparation

Ragi are to be immersed in water cleaned and taken in to cloth and made germinated or made in to sprout. Then these grains are to be roasted over mild heat and made in to fine powder form in mixi. Thereafter gud has to be made in to small pieces and made wet with little water. This gud has to be heated over mild fire, then filter with stainless steel filter and the obtained liquid is to be again boiled till it gets one thread paka (Syrup Like consistency). Then the flour of *Ragi* is to be added and mixed uniformly and the mass becomes in to small circular pieces. It should be dried and used whenever required by grinding again in mixi and this powder may be mixed with appropriate quantity of coconut water and made in to *Laddu* and served as per the requirement.

Precautions: Observation should be made to find out for any bad smell (odour) while making the sprouts of the *Ragi*. Because bed odour indicates formation of fungus. In such condition *Ragi* may be discarded.

Nutritional benefits: Contains natural iron and other trace elements (1)

Therapeutic uses: Iron deficiency Anemia (2,3)

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2. *Bajra Laddu*

Ingredients-		
1	*Bajra* (Pearl Millets)	**200 gm**
2	*Gud* (Jaggry)	**200 gm**
3	Water	Q.S. R

Method of Preparation: Bajra are to be immersed in water cleaned and taken in to cloth and made germinated or made in to sprout. Then these grains are to be roasted over mild heat and made in to fine powder form in mixi. Thereafter gud has to be made in to small pieces and made wet with little water. This gud has to be heated over mild fire, then filter with stainless steel filter and the obtained liquid is to be again boiled till it gets one thread paka (Syrup Like consistency). Then the flour of Bajra is to be added and mixed uniformly and the mass becomes in to small circular pieces. It should be dried and used whenever required by grinding again in mixi and this powder may be mixed with appropriate quantity of coconut water and made in to Laddu and served as per the requirement.
Precautions: Observation should be made to find out for any bad smell (odor) while making the sprouts of the Bajra. Because of bed odor indicates formation of fungus. In such condition Bajra may be discarded.
Nutritional benefits- Contains trace elements
Therapeutic uses- Diabetes, Obesity

3. Little Millet (*Daliya*)
Ingredients

Sr No.	Millets & other ingredients	Quantity
1	Little Millets	1 cup quantity immersed at least for 6 hours
2	Carrot, Beans, *Muttor*	2 table Spoons (after cutting into small pieces)
3	Water	2 ½ Cup
4	Fine Particles of *Ardrak*	QS
5	Green Chillies	Little quantity
6	Fenugreek Leaves (*Methi ka Patta*)	Little quantity
7	Ground nut seeds	1 table spoons (Immersed in water for some times)
8	Saindhava lavana (Rock salt)	QS
9	Tila taila	1 ½ Cup
10	Mustard Seed	1 ½ table spoon
11	*Vigna Mungo* (*Udad ki daal*)	1 table spoon
12	*Khadi Neem Ka patta*	QS

Method of Preparation

Little Millets are to be roasted in an earthen container with controlled temperature, while doing this the little millets emit a pleasant smell (Odor). Then these little millets are to be cleaned and mixed with equal quantity of water and kept for 6 hours. In a steel container the oil may be added and heated with mild temperature then mustard seed, udad ki daal. *Khadi neem ka patta*, Ground nut seeds, green chilli, *Ardrak*, Carrot, Beans, *Muttor*, *Til* oil are to be added and around 2 minutes they should be fried, then 1 ½ cup water is to be added and boiled and while boiling the little millets along with mixture of water are to be added and salt also to be added and cooked over mild fire, while cooking the container should be closed with lid. While doing this process, if it is required then little quantity of water also to be added as per the need. After cooking the materials the daliya may be served by adding Fenugreeks Leaves (*Methi ka Patta*) over the surface of *Daliya*.
Nutritional benefits- Contains trace elements and other nutritional components (4)
Therapeutic uses- Diet for the Diabetic and Obesity patients (5,6)

4. Finger millet-Palm jaggery Cookies

The term "cookie" is derived from the Dutch word '*Koekie*', meaning "little cake." Similar to cakes, in recent years, consumer preferences have shifted toward food products that not only offer traditional nutritional benefits but also provide additional health advantages through regular consumption. This growing demand aligns with the global trend toward healthier lifestyles and functional foods. Typically, cookies are small, flat, and round in shape and are available in a wide variety of flavours. The primary ingredients include flour, fat, sugar, salt, and water, with variations depending on the specific recipe or type.

Indian Standards IS 1011:2002 has classified cookies as a type of biscuit and defined it as a group of products which are shortest in bite compared to general/ common sweet varieties.

Ingredients		
1	*Ragi* (Finger Milets)	**100 gm**
2	*Tada Gud* (Palm jiggery)	**100 gm**
3	*Punarnava kashaya*	Q.S. R

Method of Preparation: Mentioned quantity of Palm jaggery was mixed with sufficient quantity of potable water (approx. 7080 ml/kg of palm jaggery) and gently heated to dissolve completely. The jaggery syrup was allowed to cool to room temperature. The cooled jaggery syrup was mixed with the given amount of cow ghee within a spiral mixer until uniform blending was achieved. Milk powder, custard powder and butter were added to the mixture and thoroughly blended. Punarnava kashaya was incorporated into the mixture and mixed evenly. Finger Millet flour and baking powder were added gradually and mixed until a smooth, uniform dough was formed. The prepared dough was shaped into the desired circular cookie shape using mold measuring 3.5 in diameter and 2.4 in height. The shaped cookies were arranged on a clean, greased baking tray. The cookies were baked in a preheated oven for 20-25 minutes. Once baked, cookies were allowed to cool and then stored in airtight containers.

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Precautions:
• All ingredients should be free from foreign materials and impurities.
• Avoid overheating the jaggery syrup to prevent caramelisation.
• Ensure uniform mixing at each step for homogeneity.
Nutritional benefits- Contains natural iron and other trace elements
Therapeutic uses- Iron deficiency Anemia

The recipes reviewed include Ragi Laddu, Bajra Laddu, Little Millet Daliya, and Finger Millet-Palm Jaggery Cookies. Each recipe outlines precise ingredients, preparation methods involving soaking, germination, roasting, and cooking, alongside precautions such as microbial safety during sprouting. Nutritional benefits highlight millets rich content in iron, trace elements, fiber, and proteins. Therapeutic uses primarily address iron deficiency anemia, diabetes, and obesity.

A comprehensive table of nutritional components across various grains (millets and others) illustrates the carbohydrate, fiber, protein, mineral, iron, calcium, phosphorous, carotene, and vitamin contents relevant to dietary planning.

Table No. 1: Nutritional components of different grains

Name of Grain	Carbo Hydrate (gm)	Fiber (gm)	Carbo hydrate/ Fiber ratio	Protein (gm)	Mineral (gm)	Iron (mg)	Calcium (gm)	Phosphorus (gm)	Carotene (µg)	Thiamine Mg (B1)	Riboflavin Mg (B2)	Niacin Mg (B3)
Foxtail millets	60.6	8.0	7.57	12.3	3.3	6.3	0.03	0.29	32	0.59	0.11	0.7
Barnyard millets	65.5	10.0	6.55	6.2	4.4	2.9	0.02	0.28	0	0.31	0.008	1.5
Kodo millets	65.6	9.0	7.28	6.2	2.6	2.9	0.04	0.24	0	0.33	0.09	2.0
Littile millets	65.5	9.8	6.68	7.7	1.5	2.8	0.02	0.28	0	0.30	0.07	1.5
Browntop millets	69.37	12.5	5.54	11.5	4.21	0.65	0.01	0.47	0	3.2	0.027	18.5
Pearl millets	67.1	1.2	55.91	11.6	2.3	8.0	0.05	0.35	132	0.33	0.25	2.3
Finger millets	72.7	3.6	20.19	7.1	2.7	5.4	0.33	0.27	42	0.42	0.19	1.1
Proso millets	68.9	2.2	31.31	12.5	1.9	5.9	0.01	0.33	0	0.20	0.18	2.3
Great Millets	72.4	1.3	55.69	10.4	1.6	4.1	0.03	0.28	47	0.37	0.13	1.8
Corn Maize	66.2	2.7	24.51	11.1	-	2.1	0.01	0.33	90	0.42	0.10	1.4
Wheat	76.2	1.2	63.50	11.8	1.5	5.3	0.05	0.32	64	0.35	0.17	5.0
Paddy Rice	79.0	0.2	395.0	6.9	0.6	1.0	0.01	0.11	0	0.06	0.06	1.2

Table No. 2: Showing the mean glycemic index of different millets. (7)

Type of millet	Mean glycaemic index	Glycaemic index food category
Barnyard millet	42.3	Low
Fonio	42.0	Low
Foxtail millet	54.5	Low
Job's tears	54.9	Low
Mixed millet	42.7	Low
Teff	35.6	Low
Finger millet	61.1	Intermediate
Kodo millet	65.4	Intermediate
Little millet	64.2	Intermediate
Pearl millet	56.6	Intermediate
Sorghum	61.2	Intermediate
Milled rice	71.7	High
Refined wheat	74.2	High

Discussion

Millets offer a sustainable nutritional solution aligned with traditional knowledge and modern dietary needs. The recipes incorporate simple, low-cost processing techniques like germination and roasting, which enhance bioavailability and safety, preserving essential nutrients. Their use in foods like laddus and

cookies demonstrates the versatility of millets in making palatable, culturally acceptable, and health-supportive food products. The therapeutic claims supported by the nutritional profiles indicate millets role in managing iron deficiency anemia due to their iron content and diabetes/obesity via fiber-rich compositions with low glycemic indices. These qualities advocate for millets integration into mainstream diets to combat nutritional insecurity and non-communicable diseases prevalent in contemporary populations.

Moreover, the adaptation of traditional millet preparations into ready-to-cook forms meets consumer demand for convenience without compromising health benefits, reflecting a valuable intersection of heritage and innovation.

Conclusion

Millets, through their diverse and nutrient-dense preparations, offer significant potential for improving public health nutrition. This review elucidates various millet-based recipes with detailed preparation methods, highlighting precautions and nutrient profiles that underpin their therapeutic efficacy. Promoting millets and their culinary integration can contribute to addressing malnutrition, lifestyle diseases, and food sustainability challenges. Further research and development efforts to innovate millet-based ready-to-cook products can bolster their acceptance and nutritional impact in modern diets.

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