e-ISSN: 3048-8796

THE NUTRITIONAL WONDERS OF MILLETS AND THEIR ROLE IN COMBATING ANEMIA

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INTRODUCTION

Anemia is one of the most common nutritional disorders in the world, particularly affecting children, adolescence girls and pregnant women. Anaemia is a condition in which the number of red blood cells or the Hemoglobin concentration within them is lower than normal. Hemoglobin is needed to carry oxygen and if you not have enough hemoglobin, there will be a decreased capacity of the blood to carry oxygen to the body's tissues. For the body to produce enough red blood cells, it needs specific vitamins, minerals, and nutrients. Among the most crucial are folic acid, iron, and vitamin B12. Low levels of hemoglobin in the blood, it can lead to fatigue, weakness, poor concentration, headache, shortness of breath fast heartbeat and impaired immunity. Anaemia affects a quarter of the global population and half the cases are due to nutritional deficiencies. Although the prevalence of anaemia is estimated at 9% in countries with high development, in low development countries the prevalence is 43%. In 2019, global anaemia prevalence was 29.9% in women of reproductive age (15-49 years). Prevalence was 29.6% in non-pregnant women of reproductive age, and 36.5% in pregnant women. 39.8% of children aged 6-59 months suffered from anaemia.

In India, the National Family Health Survey (NFHS-5) reports that over 57% of women aged 15–49 are anemic. Iron deficiency remains the most prevalent cause. While supplements and fortified foods are commonly recommended, these traditional grains like sorghum (jawae), pearl millet (bajra), finger millet (ragi), and lesser millets as banyard millet (sawa), prosa millet (cheena), kodo millet, and foxtail millet (kangni) offer a natural and sustainable way to combat anemia.

Millets:

Millets are ancient grains cultivated for thousands of years, known for their resilience in dry climates and rich nutritional value. Once a staple in Indian households, millets were gradually replaced by refined grains like white rice and wheat. However, their resurgence—especially during the International Year of Millets 2023—has brought attention back to their health benefits.

Bioactive Constituents of Millets

1. Phytoconstituents which are present in millet includes like phenol, sterol, dietary fiber, lignan, inulin, glucan, tocopherol and carotenoids. Flavonoids and polyphenols that have an antioxidant characteristic and it present in very small amount.

2. Millets are a good source of macronutrient they 7-12% protein, 2-5% fat, 65-75% carbohydrates and 15-20% dietary fiber.

3. Iron, calcium, and phosphorus are among the many micronutrients found in millets.

4. They also have a lot of zinc, magnesium, potassium, dietary fiber, and essential vitamins like thiamine, riboflavin, folic acid, and niacin.

5. It helps in tissue development and repair body cell.

6. Pre- menopausal women eating millets have a reduced breast cancer risk.

7. Many studies show that these millets are beneficial in provide most of the daily dietary iron requirement of an average person. Also they help strengthen immunity, regulate blood cholesterol, improve cardiovascular and maintain blood glucose level.

Comparison on Nutritional Composition of Rice and Wheat with Millets

Grains	Carbohydrates (g)	Protein (g)	Fat (g)	Energy (kcal)	Dietary Fiber (g)	Ca (mg)	P (mg)	Mg (mg)	Zn (m)	Fe (mg)	Thia mine (mg)	Ribof lavin (mg)	Niacin (mg)	Folic acid (µg)
Sorghum	67.7	09.9	1.73	334	10.2	27.6	274	133	1.9	3.9	0.35	0.14	2.1	39.4
Pearl Millet	61.8	10.9	5.43	347	11.5	27.4	289	124	2.7	6.4	0.25	0.20	0.9	36.1
Finger Millet	66.8	07.2	1.92	320	11.2	364.0	210	146	2.5	4.6	0.37	0.17	1.3	34.7
Kodo Millet	66.2	08.9	2.55	331	06.4	15.3	101	122	1.6	2.3	0.29	0.20	1.5	39.5
Proso Millet*	70.4	12.5	1.10	341	-	14.0	2.06	153	1.4	0.8	0.41	0.28	4.5	-
Foxtail Millet*	60.1	12.3	4.30	331	-	31.0	188	81	2.4	2.8	0.59	0.11	3.2	15.0
Little Millet	65.5	10.1	3.89	346	7.7	16.1	130	91	1.8	1.2	0.26	0.05	1.3	36.2
Barnyard Millet*	65.5	06.2	2.20	307	-	20.0	280	82	3.0	5.0	0.33	0.10	4.2	-
Amaranth seed	61	13.3	5.6	356	7.5	162.0	412	270	2.8	8.0	0.04	0.04	0.52	24.7
Wheat	64.7	10.6	1.47	321	11.2	39.4	315	125	2.8	3.9	0.46	0.15	2.7	30.1
Rice	78.2	07.9	0.52	356	02.8	07.5	96	19	1.2	0.6	0.05	0.05	1.7	9.32

Table – Source: Indian Food Composition Tables, NIN-2017; *Nutritive value of Indian Foods, NIN-2007.

Millets and Their Role in Preventing Anemia

Millets play an important role to prevention of aneamia due to presence of iron and other essential nutrient which help in increasing the efficiency of hemoglobin in blood cell. Several studies have confirmed that the regular consumption of certain millets—especially ragi, bajra, and foxtail millet—can significantly improve iron lavels and haemoglobin formation levels. These grains contain high levels of non-heme iron (plant-based iron), which, when combined with vitamin C-rich foods, is more efficiently absorbed by the body.

How Millets help:

- They are naturally rich in iron, which is essential for red blood cell production.
- Phytates, although present, can be reduced by soaking, fermenting, or sprouting, enhancing iron bioavailability.
- They are also gluten-free, making them suitable for people with gluten intolerance or celiac disease. This improves nutrient bioavailability, helping the body absorb iron.
- Millets also contain vitamin B-complex, magnesium, and copper, which support red blood cell formation.
- Some millets like foxtail millet contain natural antioxidants that improve gut health and iron absorption
- High fiber helps prevent intestinal disorders, which can interfere with iron absorption.

Including Millets into the Daily Diet

- To maximize the benefits of millets in preventing anemia:
- Replace one grain meal daily with a millet-based dish.
- Pair millets with vitamin C rich foods (lemon, amla, guava or tomato) to enhance iron absorption.
- Use traditional cooking methods like fermentation and sprouting to improve nutrient bioavailability.
- Tea and coffee inhibit the absorption of iron, therefore avoid consuming them with millet meals.
- Choose millets-based snacks like puffed millets, millet cookies, or cutlets.
- Prepare healthy millet laddoos using sesame, jiggery, peanuts and nuts.

- Use throughout the day in different forms salads, stir-fries, or patties.
- Explore local recipes and traditional dishes using millets.

Government Initiatives programs:

Recognizing the role of millets in addressing malnutrition and anemia, the Indian government launched several programs:

- The POSHAN Abhiyaan promotes the use of millets in maternal and child nutrition.
- Mid-Day Meal Schemes: millets are being included to school meal plans.it has been effectively applied in states like Karnataka, Tamil Nadu, and Andhra Pradesh.
- The United Nations has declared 2023 to be the International Year of Millets, and India is aggressively promoting this initiative to raise awareness of the health and environmental advantages of millets worldwide.

CONCLUSION:

The millets are considered as nutraceutical due to its amazing nutritive value and health benefits over other cereals and regain their place as superfood with their iron-rich profiles, fiber content, and adaptability to Indian kitchens, millets offer a natural, affordable, and culturally accepted solution to fight anemia. Millets based recipe like Cutlet, Pudina Rice, Pyasam, biscuits, cake, pasta, idlli, dosa, fermented food and traditional food like roti, rice, khichdi are easy to cook and some of product available in market.

The aim of the article was to determine the efficiency of millets in improving health status and well-being of human being and recognize the importance of millets as nutritious food and full- fill the nutritional need of population and also increase demand of consumption of millets in daily meal.

This article revealed that millets can provide all or most of the daily dietary iron requirement of an average person. Different type of nutrient deficiency diseases caused by the today lifestyle may be cured just by eating millets in breakfast, lunch and dinner. It would be worth for people (anemic) to add millets in their daily diet to improve the health status and well-being in developing as well as developed countries. By integrating them into our daily meals—through porridges, rotis, khichdis, or laddus—we not only honor our traditional diets but also take a sustainable step toward better health.

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