IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876
 Journal UGC CARE Listed (Group-I) Volume 15, Issue 01, 2026

Impact of Millet-Based Nutritional Interventions on Lactating Mothers: A Brief Review

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ABSTRACT

Maternal nutrition during lactation is vital for the health of both mother and infant. Millets, as nutrient-dense and climate-resilient crops, have potential to improve maternal nutrition. This brief review shows that millet-based interventions enhance hemoglobin levels, reduce anemia, and improve overall nutritional status. However, limited studies focus specifically on lactating mothers, highlighting the need for targeted research and policy support.

Keywords: Millets, Lactating Mothers and Nutritional Intervention etc.

1. INTRODUCTION

Maternal nutrition is a key determinant of neonatal health, breastfeeding outcomes, and long-term development. In India, a high prevalence of anemia and undernutrition among women continues to pose a major public health challenge. Lactating mothers require increased levels of energy, protein, and micronutrients, particularly iron and calcium, Gupta, A., et al. (2025). Millets, including finger millet (*Eleusine coracana*), pearl millet (*Pennisetum glaucum*), and sorghum (*Sorghum bicolor*), are rich in essential nutrients and bioactive compounds. Their high iron and calcium content, along with low glycemic index, make them suitable for maternal diets, Kaur, K. D., et al. (2014). Despite these benefits, millet consumption has declined due to dietary shifts toward refined cereals. This review aims to systematically evaluate the impact of millet-based interventions on lactating mothers.

2. METHODOLOGY

2.1 Study Design

This study follows a systematic review approach based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

2.2 Search Strategy

A comprehensive literature search was conducted using three major databases: **PubMed, Scopus, and Google Scholar**.

2.3 Inclusion Criteria

- Human studies involving millet-based dietary interventions.
- Studies reporting outcomes such as hemoglobin, BMI, or micronutrient status.
- Randomized controlled trials, quasi-experimental, and cohort studies.

2.3 Exclusion Criteria

- Animal studies.
- Studies without measurable outcomes.
- Review papers without primary data.

3. NUTRITIONAL PROFILE OF MILLETS

Millets contain **2–8 mg iron/100 g, high calcium (especially finger millet), 7–12% protein, and 8–15% dietary fiber**, along with antioxidants (polyphenols) that support metabolic health and reduce oxidative stress.

4. RESULTS

4.1 Summary of Included Studies

Study	Population	Intervention	Duration	Outcome
Anitha et al. (2021)	Women	Millet-based diet	3 months	↑ Hemoglobin
Gupta et al. (2025)	Adults	Millet supplementation	6 months	↑ BMI, ↓ anemia
Rao et al. (2017)	Women	Dietary diversification	4 months	Improved nutrition

4.2 Effect on Hemoglobin Levels

Millet-based interventions showed significant improvement in hemoglobin levels. A meta-analysis by Anitha et al. (2021) reported an increase of **13–15% in hemoglobin levels** among intervention groups. This is particularly relevant for lactating mothers, who are highly vulnerable to iron deficiency anemia.

4.3 Effect on Body Mass Index (BMI)

Studies indicate modest improvements in BMI among women consuming millet-based diets. Increased dietary diversity and nutrient intake contribute to better energy balance.

4.4 Micronutrient Improvement

Millets contribute to: Improved iron status, increased calcium intake and better overall micronutrient profile

4.5 Role of Processing Techniques

Processing methods such as **fermentation, germination, and soaking** play an important role in improving the nutritional quality of millets. These techniques help reduce anti-nutritional factors like phytates and tannins, which otherwise limit the absorption of essential minerals such as iron and calcium.

4.6 Impact on Lactation Outcomes

Improved maternal nutrition positively influences lactation outcomes by enhancing breast milk quality and supporting infant growth, Saleh, A. S. M., et al. (2013). Although millets have strong nutritional potential, more research is needed to directly confirm their impact on lactation.

5. DISCUSSION

This systematic review highlights the significant role of millet-based interventions in improving maternal nutritional status. The increase in hemoglobin levels and reduction in anemia prevalence indicate that millets can be an effective dietary strategy, Shobana, S., et al. (2013).

However, a major limitation is the lack of studies specifically focused on lactating mothers. Most available evidence is extrapolated from general populations. Socio-cultural barriers, lack of awareness, and limited availability of millet products further hinder their adoption.

6. FUTURE RESEARCH DIRECTIONS

- Conduct well-designed randomized controlled trials (RCTs) specifically among lactating mothers to generate strong scientific evidence.
- Investigate the impact of millet consumption on breast milk composition and nutritional quality.
- Evaluate the long-term effects of millet-based diets on maternal health and infant growth and development.

7. CONCLUSION

Millet-based nutritional interventions show strong potential in improving hemoglobin levels, micronutrient status, and overall health among women. Their integration into maternal nutrition programs can significantly reduce anemia and improve public health outcomes.

However, further targeted research is required to establish their role in lactation-specific outcomes.

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