

## Millets Impact on Dietary Nutritional Status

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### Abstract

Millets are the least used of all the grains, although being regarded as a significant one globally. Millet grain is ideal as food and feed since it is rich in minerals and phenolic compounds that have positive health effects. The range of minerals and phenolic compounds found in finger and pearl millet are strong indicators that choosing millet for use as food or feed requires careful consideration. Millets include phenolic characteristics that include phenolic acids, flavonoids, and tannins, all of which are good for human health. In addition, finger millet has a phenolic profile that is remarkably distinct, more varied, and plentiful than pearl millet's. The significant antioxidant activity of millet's phenolic components has been demonstrated through research. Because millet grains contain phytochemicals, they improve human health by reducing phytates and cholesterol levels. The quest for substitute grains is necessary to relieve the pressure caused by the frenetic demands on maize and its uses in numerous industries. The performance of the various animals improved when maize was replaced in their diets with pearl and finger millets. Including these grains in the diet may enhance wellbeing and lower disease risks. Use of pearl millet in broiler diets of at least 50% is permitted without having a negative impact on broiler performance or egg output. Recently, millet grain has been added to other foods and used to create classic drinks.

**Key words-** Millet, Cholesterol level, Diets, Phenolic acid, Antioxidant.

### Introduction

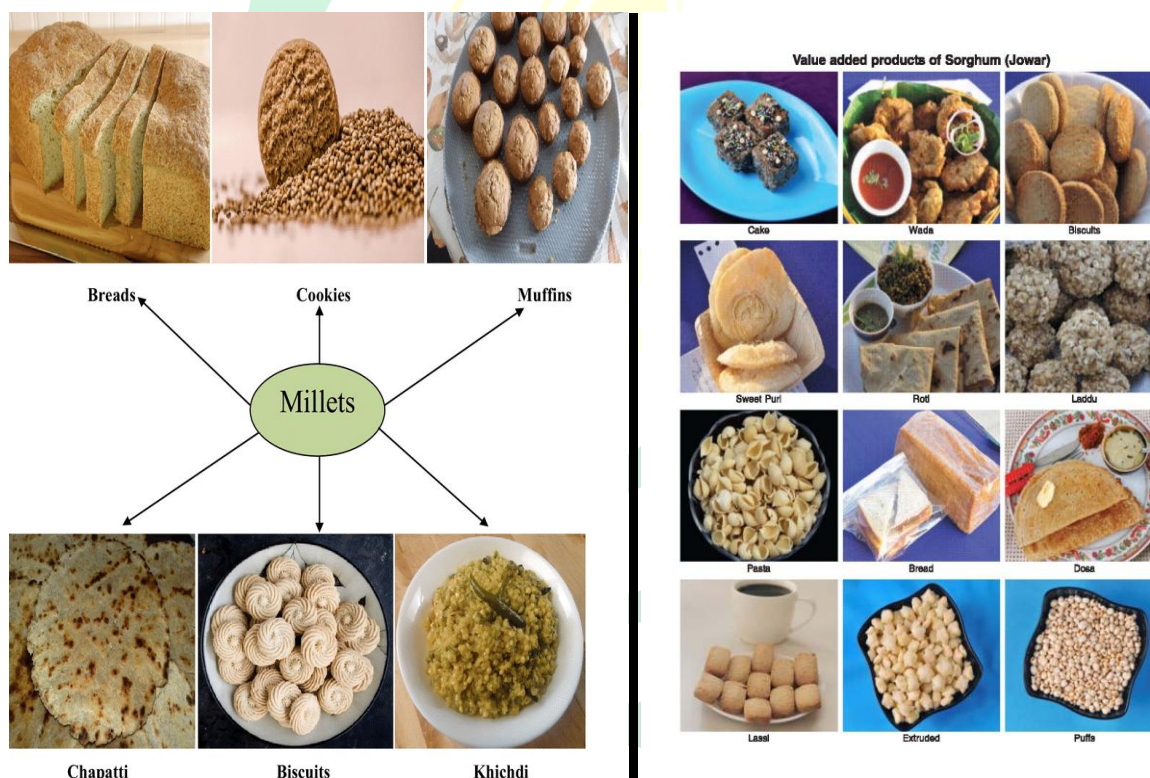
One of the earliest crops to be farmed is millets, which are cereal grains from the Poaceae grass family. Generally speaking, the two main millets used for food and feed are finger millet (*Eleusine coracana*) and pearl millet (*Pennisetum glaucum*). Both finger millet

and pearl millet are thought to have come from the sub-humid uplands of East Africa and sub-Saharan Africa, respectively. The majority of the world's millet production and trade is accounted for by these two. Pearl and finger millets have received the majority of attention from recent agricultural and scientific initiatives geared towards the growth of millets. Dube et.al. feel that the desire to grow millet and sorghum in recent years rather than maize and other important crops is a result of the fact that these grains are environmentally compatible with semi-arid regions because of their capacity to withstand drought. They are regarded as hardy crops in terms of growth requirements since they can tolerate challenging environmental conditions including erratic weather and nutrient-poor soils. Pearl millet, a crop with a significant impact on food security, is underappreciated despite its importance and significance. Maybe the indifference is due to the fact that it is considered a crop for subsistence farmers in marginal agricultural regions with socio-ecological conditions. Numerous researchers have suggested that millets can be a significant source of essential nutrients like amino acids, minerals, and trace elements. Wide variances in the nutritional makeup of pearl and finger millets should be obvious, of course. Pearl millet is thought to be a substantial source of thiamine, niacin, and riboflavin and has more energy than other cereal grains like rice and wheat, according to Shweta. Additionally, the amount of minerals like After maize, wheat, rice, barley, and sorghum, pearl millet is regarded as the sixth highest producing crop in the world and is an important grain. It is also regarded as one of the crops that can offer small-scale farmers good nutrition and money, contributing to their livelihoods and the supply of food.



### The supplemental food items made from millet are as follows:

- Various millets' flour, jaggery, and milk powder were combined to create a mixed millet milk malt. A sugar product made from sugarcane is called jaggery. It contains iron and contributes to sweetness. Enhancing the nutrient density is milk powder. Every day, 100 mL of water was supplied with 15 grammes of the malt.
- Ragi cutlets: Ragi (finger millets) flour was used to make ragi cutlets. Proteins, iron, calcium, phosphorus, and fibre are all abundant in ragi. To AWWs, a premix was produced and supplied. To make cutlets at AWCs, AWWs added 50 g of drumstick/spinach/fenugreek leaves, 15 g of carrot, and 15 g of beetroot. Once a week, two ragi cutlets weighing 30 g each were supplied.
- Mixed millet energy bars were made using a variety of millets and flour made from jaggery. A bar was created from the flour. Once a week, two 25 g bars were provided.



### Millet-Based Diet Improve the Growth of Children

Age-related nutrient needs vary. In healthy adolescents, the weight normally doubles and the height rises by 20%. To maintain bone accretion and promote growth during this period, all important nutrients are needed, including protein, calcium, iron, and vitamins. Protein, particularly the branched chain amino acid leucine and amino acids containing

sulphur, is a crucial component needed to sustain the growth of muscle mass and is thus particularly crucial during adolescence. The priority ingredient for bone growth is usually calcium, especially during the rapid growth spurts of infancy (first 12 months) and adolescence (13–18 years). Compared to milk, finger millets have a calcium concentration that is three times higher, and finger millets also retain calcium better than any other grain. Additionally, when compared to refined wheat and milled rice, millets have higher levels of the sulphur amino acid methionine .

In the usual diets, replacing rice with millet had a substantial favourable impact on height, weight, MUAC, and chest circumference in a range of age groups (infants, preschoolers, school-age children, and adolescents). Given that the other components of the diet were identical between the two groups, millets' beneficial effects are likely due to their naturally high level of growth-promoting nutrients, particularly sulphur amino acids, total protein, and calcium in the case of finger millets.



### **Scientific evidence shows eating millets leads to better growth in children**

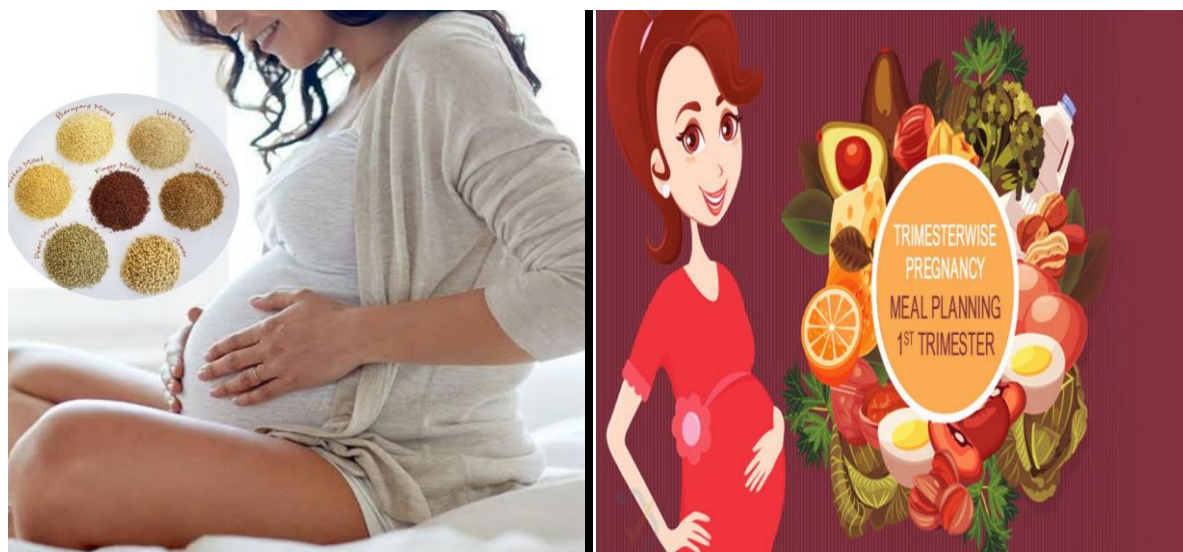
When millets are substituted for rice in regular meals, researchers studying the nutritional advantages of millets have discovered that these "smart foods" can increase growth in children and adolescents by 26 to 39%. The findings imply that millets can greatly aid in the fight against malnutrition. The study, which is a review and meta-analysis of eight

previously published studies, was published in the journal *Nutrients*. Dr. S. Anitha, Senior Scientist-Nutrition at the International Crops Research Institute of the Semi-Arid Tropics (ICRISAT), served as the project's coordinator. It was carried out by seven organisations in four nations. "These results are attributable to the naturally high nutrient content of millets that exhibit high amounts of growth promoting nutrients, especially total protein, sulphur-containing amino acids, and calcium in the case of finger millets," said Dr. Anitha.

The review included young children in infancy, preschoolers and school-age children, as well as teenagers. One study in the review utilised sorghum, two used a combination of millets (finger, pearl, foxtail, tiny, and kodo), and five of the studies used finger millet. When compared to kids on regular rice-based diets, children fed millet-based meals had a relative increase in mean height of 28.2%, weight of 26%, mid-upper arm circumference of 39%, and chest circumference of 37%.

#### **Nutritional impact of Millet based Foods on Pregnant and Nursing woman**

The physiological condition of pregnancy increases the need for nutrition to support the fetus's growth and development. As a result, during pregnancy, there are changes in weight, blood volume, and hormone activity. [1] One of the immediate issues brought on by insufficient intake, decreased absorption, limited reserves, and infections is iron-deficiency anaemia. Similar to this, nursing moms also suffer from iron deficiency anaemia as a result of iron loss, which is made worse by the postpartum menstrual cycle. As a result, pregnant women and nursing moms need to receive a balanced diet that includes both calories and proteins, with an emphasis on iron. Through Anganwadi Centres (AWCs) run by Anganwadi Workers (AWWs), the Integrated Child Development Services (ICDS) provides a platform for the delivery of nutritional interventions under the Supplementary Nutrition Programme (SNP) at the community level. Despite the efforts of ICDS, reports from the World Health Organisation (WHO), the United Nations Children's Emergency Fund, and the National Family Health Survey (NFHS) show that high rates of malnutrition are widespread.



### Millet nutritional value

Millets are a superior source of protein and other micronutrients and are nutritionally comparable to popular cereals. While finger millet contains 12–16% protein as well as 2-5% lipids, sorghum and the majority of millets only contain about 10% protein and 3.5% lipids. Micronutrients, such as vitamins and minerals, are abundant in sorghum and millets. Millets have fewer prolamins that are cross-linked, which is another factor raising the digestibility of millet proteins.

Food Grain	Carbohydrates (g)	Protein (g)	Fat (g)	Energy (g)	Crude fiber (g)
<b>Finger millet</b>	72.0	7.3	1.3	328	3.6
<b>Kodo millet</b>	65.9	8.3	1.4	309	9.0
<b>Proso millet</b>	70.4	2.5	1.1	341	2.2
<b>Foxtail millet</b>	60.9	12.3	4.3	331	8.0
<b>Little millet</b>	6.0	7.7	4.7	341	341
<b>Barnyard millet</b>	65.5	6.2	2.2	307	9.8
<b>Sorghum</b>	72.6	10.4	1.9	349	1.6
<b>Pear millet</b>	67.5	11.6	5.0	361	1.2

## Conclusion

For pregnant and nursing women in a community setting, millet-based foods such as mixed millet malt, ragi cookies, ragi cutlets, and mixed millet energy millet bars made with ragi, jowar, and bajra showed a favourable impact on weight and BMI. It has comparable nutrients to conventional cereals like maize, wheat, and rice, or even more in some cases. Additionally, millets are given extra significance in terms of health benefits, particularly for humans, due to the presence of nutraceuticals in them. Millets can be used in broiler diets up to 100% without having a negative impact on the birds' performance. The performance parameters of ruminants significantly improved when millet was added to their diets. The cost of feed for animal production may gradually decrease as a result of this inclusion, which will also lower the price of livestock products for consumers who depend on them for protein.

