

Millets and Their Value-Added Products

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Introduction

Once called the ‘poor man’s diet’, the humble jowar, bajra and ragi are in vogue today. They are India’s very own superfoods and are considered far more nutritious than the South American quinoa or chia, which has become a fad among up-market Indians. Most importantly, they are one-fourth the price (a 1 kg pack of quinoa is priced at ₹ 500) of the imported grains. Conditions of the world has provided them a status of “famine crops” in the semiarid tropics and drylands of Africa and Asia. Sorghum (*Sorghum bicolor*), pearl millet (*Pennisetum glaucum*), finger millet (*Eleusine coracana*), foxtail millet (*Setaria italica*), barnyard millet (*Echinochloa frumentacea*), kodo millet (*Paspalum scrobiculatum*), proso millet (*Panicum miliaceum*), and little millet (*Panicum miliare*) are the important millets cultivated in African and Asian countries. Millets are a group of small-seeded crops and probably the world’s earliest food plants domesticated by humans. They have ability to grow in the harshest climatic conditions and are quite rich in micronutrients as well as possess unique amino-acid profile and dietary fibers. Therapeutic functions of coarse cereals and millets highlighted their possible beneficial role as antioxidants, excellent bulking agents and cholesterol-lowering agents in combating many diseases like esophageal cancer, hormone-dependent cancers and Type 2 diabetes mellitus. But presence of anti-nutrients, polyphenolic and pigmentation limits their application for food purposes. Increasing micronutrient deficiency and protein malnutrition can be alleviated through the utilization of whey, milk solids and pearl millet in food products. Although, milk is considered as “Nature’s Perfect Food” but it too lacks certain key nutrients, however, combining milk and cereals/millets in the form of a “Composite Foods” has opened new vistas for health-conscious people and food processors alike. Nowadays, processing of millets, more specifically, pearl millet is

increasing rapidly and it is also significant to eliminate some unfavourable reasons to increase the consumption of millets. So, processing of pearl millet is important for increasing shelf life and reducing antinutrients and development of value-added products (High fiber food products having low Glycemic index for Diabetics).

Some value-added products of millets

Composite flour

Value addition can be done by mixing millet flour with wheat flour. Addition of millet flour in a certain ratio will enhance the nutritional and functional properties and can also change the physio-chemical properties of the products. Mixing of millet flour (10–30%) with wheat flour (70–90%) increases the percentage of protein, fat and reduces the percentage of total carbohydrates.

Marketing brands:

1. Nootri Family Millet Mix (Composite Flour) is manufactured to provide a balanced nutrition. This flour is high in Vitamin A, C, D3 and B12.
2. Ueir organic foods(sprouted millet health mix)

Biscuits

Climate-smart grains, Millets are rich in minerals, dietary fibre, low in fat, low GI and are known to fight lifestyle diseases. Now, get the nutrition of Millets in the form of Multi millet biscuits. By making biscuits from millets increases shelf life and can be preserved for a longer time than usual. Biscuits of highly acceptable quality are made from a formulation of composite dairy-cereal mix consisting of whey protein concentrate, pearl millet flour and refined wheat flour. Optimized biscuits provide 15% of calorie, 20% protein, 7.6% iron; 9% of calcium and 35% of daily iron requirement.

Some brands which make multi-millet biscuits are:

1. Health Sutra Multi Millet Biscuits
2. Britannia has launched ragi cookies and five-grain digestive biscuits under its NutriChoice brand.
3. Organic *Shridhanya* combines the secret five wonder grains named *Shridhanya* Millet.
4. Chaudhary Charan Singh Haryana agricultural university under ABIC food processing and value addition produces bajra biscuits.

Puffed/Popped and Flaked Millets

Consumption of major cereals in the form of a variety of puffed and popped products is a common practice in developed and developing countries. Cooking a healthy breakfast isn't time-consuming anymore. This low-calorie, high-fiber, immunity-boosting wonder is all you need to begin a fresh day. Loaded with enormous benefits, these flakes are a healthy replacement for breakfast cereals.

Marketing brands:

1. Trenpa's Little Millet Flakes (Samai) a healthy, ready-to-eat super food.
2. Orggu finger millet flakes also promote small farmers.
3. Health Sutra's foxtail millet flakes.

Ragi Noodles

Extrusion cooking because of its low cost and continuous processing capability has been accepted as one of the most useful technologies during the recent years in the field of food processing.

Marketing brands:

Naturally Yours Multi Millet noodles are a power packed and easy to make meal that combines the goodness of five nutritious millets and whole wheat atta.

Slurrp farm Little Millet Noodles

Millet for infants

Millet is a nutritious grain that is safe for infants as well. It can make for a healthy, wholesome meal that is easily digestible, gluten-free, and versatile. The benefits of millet for babies are numerous as it is rich in iron, minerals, calcium, and more, aiding in the healthy and steady growth of the baby.

Marketing brands:

1. Kare & Karess Baby Cereal - Sprouted ragi, Millet & Rice - Mango - 200 g (6 months+)
2. Baby burp Finger Millet Mix Porridge - 200 g

Bajra Lassi

Bajra lassi contains nutrients in easily assimilable form and has a shelflife of 21 days at refrigeration temperature.

Marketing brands:



1. CCSHAU, Hisar - produces composite foods, *bajra* lassi and iron enriched *bajra* biscuits.
2. Mishti Farmer's Producer Company manufactures *bajra* lassi - the energy drink

Major concerns and future perspectives

Despite the high nutritional value, one of the essential constraints limiting broader commercial utilization of pearl millet grain is "flour rancidity" or development of off-flavor and a 'mousy' odor in pearl millet flour varying from within a few hours to 4-5 days after milling. It leads to shorter shelf life, affects the flour quality, and raises concerns about safety for consumption. Due to improper storage conditions, the constraint becomes more severe in rural families, increasing the struggle of rural women and limiting their possibilities for market access. So far, only a little amount of study has been done on the biological/genetic aspects of rancidity in pearl millet; the majority of the research has been done to find physical treatments such as post-harvest processing, storage, and packing. Therefore, in order to extend the shelf life of pearl millet flour, it is necessary to identify factors that may be responsible for producing off flavors in the flour. Although several processing methods including decortications, heat treatment, and grain blanching have been shown to extend the shelf life of flour. However, modifying the grain composition with desired parameters might be more successful than processing methods in preventing the development of rancidity.

Conclusion

Milletts have played a significant role in millions of Indians' traditional diets for ages. However, over the past few decades, millets have lost ground to commercial crops as a result of better access to the inputs those crops need, declining demand as a result of changing eating habits, and the availability of cereals like rice and wheat through the PDS (Public Distribution System) at lower prices. Though, millets are rich in micronutrients like iron, magnesium, phosphorus, and potassium and are easy to digest, high in fiber, which reduces the risk of diabetes and cholesterol. It implies that millets have the ability to help combat malnutrition and a lot of diseases if incorporated into the diet. In this direction, the United Nations General Assembly adopted an India-sponsored resolution to mark 2023 as the international year of millets. The declaration of 2023 as the 'International Year of Millets' will certainly support all these efforts and make millets a popular and healthy food choice.