MILLETS FOR SUSTAINABLE FOOD SECURITY

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Millets are heritage crop among others; in India farmers are growing as it is traditional crop from long back. Millets were consumed widely in India before the Indian Bronze Age 4,500 BC, as indicated by the designation of foxtail millet (priyangava), Barnyard millet (aanava), and black finger millet (shyaamaka) in some of the oldest Yajurveda written work. For years of age, millets have served as an essential diet, particularly in rural India. Millets were typically planted as rain-fed crops since they adapted well to the arid Deccan Plateau region of southern India. From green revolution world are considering wheat and rice only are staple food for the people and millets get ignored. This leads to create loss of water, excess use of fertilizer and detoriation of soil health and ultimate damage environment and human health. This issue again turns to concentrate on millets production and consummation.

Millets can thrive in a variety of environmental conditions and are resistant and drought tolerant. Millets can withstand a variety of environmental factors, including drought. Millets can grow with little input, hence they are typically cultivated by tiny, underprivileged farmers to meet family food needs. Consuming millets grains has a number of health benefits, including protection against chronic and other health conditions brought on by contemporary lifestyles. Millets are high in proteins, minerals, and vitamins. Despite having many health advantages and great agro-economic potential, millets are disliked and underutilized in industrialized countries due to their coarse texture.

Millets: An approach sustainable agriculture and health benefit

Millets

Food and Economic security	**Nutrition security and safety from disease**
➢ Sustainable food source to feed people in changing climate ➢ Resistant to drought, stress, pest etc ➢ It known as climate resilient crop ➢ Production with low investment ➢ Value addition leads to more income.	➢ Rich in mineral, micronutrient, vitamins and protein ➢ Rich in bioactive compound ➢ Gluten free: Good for Celiac disease ➢ Low GI: Good for diabetic persons ➢ Helps to control cardiovascular disease, anemic patients etc

Millets are classified under cereal or known as part of cereals, family of millet is Poaceae. Millets are coarse grains of cereal family and known as Small seeded cereal grasses: coarse grains: Nutri cereals/ valuable food grains. They are raised mainly as rain-fed Kharif crops (sowed with the onset of the monsoons) in India. Sorghum, Bajra, Proso millets, finger millets, foxtail are comes under the head millets

I. TYPES OF MILLETS

1. **Sorghum Millet (Jowar)**
   - **Growing State:** Maharashtra, Karnataka, Rajasthan, TN, Andhra Pradesh, UP, MP, etc.
   - **Nutritional Value:** High in fiber, protein, and minerals such as phosphorus and iron
   - **Commonly Used:** Roti, Bhakri, Khichdi, Porridge

2. **Proso Millet (Chena / Barri)**
   - **Growing Area:** Uttar Pradesh, Rajasthan, Haryana, Gujarat, Maharashtra, Karnataka, Tamil Nadu
   - **Nutritional Value:** High in protein, fiber, and minerals such as iron and phosphorus
   - **Commonly Used:** Roti, Khichdi, Kheer, Porridge

3. **Pearl Millet (Bajra)**
   - **Growing State:** Rajasthan, UP, Haryana, Gujarat, Madhya Pradesh, Maharashtra, and Karnataka.
   - **Nutritional Value:** High in fiber, protein, iron, magnesium, and calcium
   - **Commonly Used:** Roti/ Bhakri, Khichdi, Porridge

4. **Foxtail Millet (Kakum / Kangni)**
   - **Growing State:** Tamil Nadu, Andhra Pradesh, Karnataka, Odisha, Maharashtra, Madhya Pradesh
   - **Nutritional Value:** High in protein, fiber, and minerals such as copper and iron
   - **Commonly Used:** Upma, Pongal, Kheer, Pulao

5. **Finger Millet (Ragi)**
   - **Growing State :** Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Kerala
   - **Nutritional Value:** High in calcium, iron, fiber, and protein
   - **Commonly Used:** Ragi Mudde, Dosa, Idli, Porridge

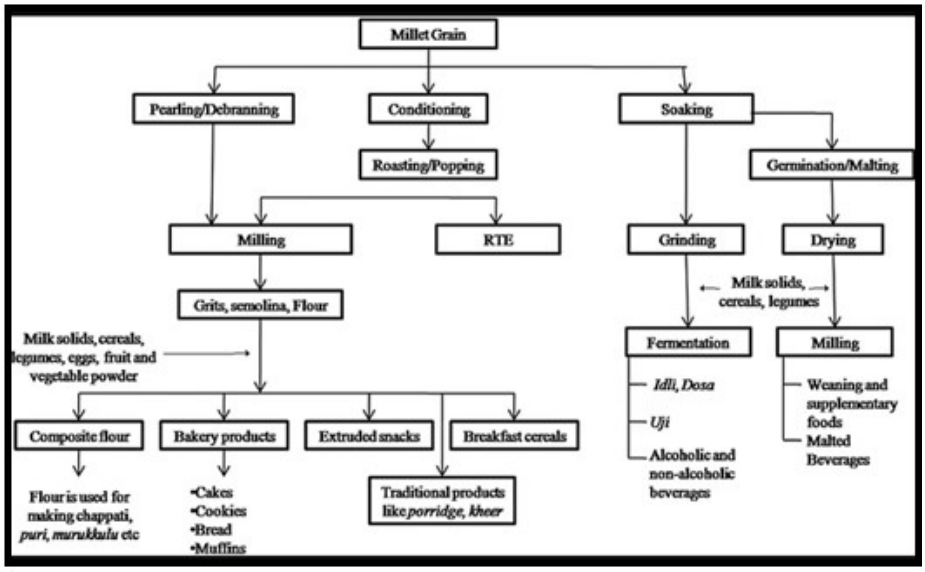
6. **Browntop Millet (Korle)**
   - **Growing State:** Karnataka and Andhra Pradesh.
   - **Special Character:** less fertile soil.

7. **Barnyard Millet (Sanwa)**
   - **Growing State:** Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat, Karnataka, Tamil Nadu
   - **Nutritional Value:** Rich in fiber, protein, and minerals such as calcium and phosphorus
   - **Commonly Used:** Khichdi, Dosa, Idli, Upma

8. **Little Millet (Moraiyo/ Kutki)**
   - **Growing State:** Karnataka, Tamil Nadu, Maharashtra, Uttar Pradesh, Uttarakhand
   - **Nutritional Value:** Rich in fiber, protein, and minerals such as potassium and magnesium
   - **Commonly Used:** Khichdi, Dosa, Idli, Upma

9. **Kodo Millet**
   - **Growing State:** Maharashtra, Odisha, Uttar Pradesh, Tamil Nadu, Andhra Pradesh, Telangana
   - **Nutritional Value:** High in protein, fiber, and minerals such as calcium, iron, potassium, magnesium and zinc It helps to strengthened neurological system. Niacin, B6, and folic acid, among other B vitamins and other vitamins and minerals, are especially abundant in kodo.
   - **Commonly Used:** Khichdi, Pulao, Upma, Kheer

II. MILLET-BASED CONTEMPORARY FOODS



III. SCHEMATIC DIAGRAM FOR DEVELOPING MILLET-BASED COMPOSITE FOODS

Researchers and culinary scientists are developing millets and combining them with other ingredients to create products with extra value. Foxtail millet, finger millet, proso millet, and pearl millet were combined with wheat flour to create bakery goods such biscuits, cakes, and cookies by Shadang and Jaganathan. The chosen ratios for cake and biscuits were 10:90, 20:80, and 30:70, whereas the chosen ratios for cookies were 15:85, 20:80, and 25:75. The combinations of all three levels were found to be perfectly appropriate for the three products based on the sensory analysis of their products. For the creation of gluten-free cookies, Rai et al. used alternative flours/meals based on rice (*Oryza sativa*), maize (*Zea mays*), sorghum (*Sorghum vulgare*), and pearl millet (*Pennisetum glaucum*). According to their research, cookies made from rice and sorghum, maize and pearl millet, rice and pearl millet, and control cookies had the lowest sensory scores. Pearl millet and sorghum flour had the highest sensory scores. The flours made from pearl millet and sorghum had the best pasting qualities, followed by mixtures of maize and pearl millet. However, the control (wheat) cookies had the highest yield (186.8%), while the rice and maize cookies had the highest spread ratio. The cookies made from a mixture of sorghum and pearl millet were nutrient-dense and had increased fat, protein, ash, and calorific values.

IV. CONCLUSION

Millets play a significant part in the adaptation to changing climatic conditions. They can grow in a variety of environments and only need a small amount of input when faced with challenging conditions. Millets are a miracle crop that can both protect the environment and provide wholesome food and animal feed for people. They conserve natural resources like soil, water, and the environment for current and future generations. People are increasingly cooking millets as food in their regular diet due to their numerous health benefits. One strategy to feed a growing population without depleting resources is to produce and add value to millets. Consume millet to be healthy.

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