



CHH. SHAHU INSTITUTE OF BUSINESS EDUCATION & RESEARCH TRUST'S  
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3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the year 2023-24:

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Year	2023-24
Number	15



  
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Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	ISSN number
1	Potential of Finger Millet (Eleusine Coracana): A Review on its Nutritional Composition and Health Benefits	Mrs. Shweta A. Patil	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
2	Development of Gluten - Free Cookies Incorporated with Musa Spp.	Mrs. Shweta A. Patil, Ms. Bhawana S. Agarwal, et.al	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
3	Nutritive Value of Millets: An Overview	Mrs. Ashwini S. Raibagkar et.al.	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
4	Incorporation of Moringa Leaves in Multi Grain Flat Bread (Premix)	Mrs. Ashwini S. Raibagkar et.al.	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
5	Serving High Profile Nutritious Cake: Replacing Wheat Flour with Finger Millet Flour and Almond Flour	Dr. Neelam S. Jirage	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
6	Development and Formulation of Fasting (Upwas) Instant Millet Kheer-mix.	Mrs. Yogita R. Mirajkar et.al.	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
7	A Study on Development of Millet Based Snack Food Multi Millet Nachos	Mrs. Yogita R. Mirajkar	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
8	Development of Moodles Supplemented with Underutilized Vegetables Leaves	Mrs. Yogita R. Mirajkar et.al.	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
9	Pearl Millet as Functional Food: An Overview	Ms. Divya S. Satpute et.al.	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766



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10	Formulation of Ready to Cook Soup Mix by Waste Utilization of Beetroot Greens and Banana Peels	Ms. Divya S. Satpute et.al	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
11	A Review on Emerging Technologies Applied for Pearl Millet	Ms. Divya S. Satpute et.al	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
12	Formulation and Organoleptic Evaluation of Ragi Millet Papad Prepared within Corporation of Wood Apple Powder (Limonia Acidissima)	Ms. Sakshi M. Desai et.al	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
13	Formulation and Organoleptic Evaluation of Ragi Cookies Prepared with Incorporation of Okara Flour and Pandan Leave Extract	Ms. Sakshi M. Desai et.al	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
14	Pearl Millet as a Functional Food - A Review	Ms. Siddhi. S. Shinde et.al	Food Technology	Scholarly Research Journal for Interdisciplinary Studies (International, peer reviewed, Refereed)	2319-4766
15	A Study of Farmers Awareness Towards Biofertilizers Consumption in Karad City	Ms. Pooja S. Sarolkar and Ms. Anisha A. Patil	Environment Science	JETCIR	2349-5162 (UGC Care list)



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AN INTERNATIONAL, PEER REVIEWED, REFEREED & QUARTERLY  
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**JULY-SEPT, 2023, VOL 11/63**

- 1 **DEVELOPMENT AND FORMULATION OF FASTING (UPWAS) INSTANT MILLET KHEER-MIX** 1-6  
✓ *Mrs. Yogita Mirajkar, Ms. Aarohi Moghe, Ms. Ketki Phadnis, Ms. Nisha Savardekar, Ms. Geetanjali Marulkar, Ms. Samruddhi Nigade, Ms. Parhina Parande*
- 2 **DEVELOPMENT OF GLUTEN-FREE COOKIES IN CORPORATED WITH MUSA SPP** 7-13  
*Mrs. Shweta Patil, Bhawana Agarwal, Sonali Patil, Arti Jambure, Megha Barge, Aishwarya Bongarde, Prajakta Thomake*
- 3 **FORMULATION AND ORGANOLEPTIC EVALUATION OF RAGI MILLET PAPAD PREPARED WITH INCORPORATION OF WOOD APPLE POWDER (LIMONIA ACIDISSIMA)** 14-18  
*Sakshi M. Desai, Shrutika B. Patil*
- 4 **REVIEW ON NUTRITIONAL VALUE AND HEALTH BENEFITS OF RAGI AND PERAL MILLETS AS AN INTEGRAL PART OF INDIAN DIET** 19-25  
*Sugandhi Gayatri, Kulkarni Vaishnavi, Pednekar Aditi, Patil Shweta, Patil Sayali Shinde Siddhi, Patil Pradnya*
- 5 **REVIEW ON HEALTH BENEFITS OF AMARANTH SEED AS A FUNCTIONAL FOOD** 26-29  
*Sugandhi G, Suryawanshi M, Powar S, Shelake I, Mhetre M, Swami S, Joshi D*
- 6 **NUTRITIVE VALUE OF MILLETS: AN OVERVIEW** 30-32  
*Mrs. Ashwini Raibagkar Muskan Makandar, Sanam Khalipha, Suhana Sayyad Mariya Shaikh, Mahek Kavathekar, Riya Kamble*
- 7 **FORMULATION AND ORGANOLEPTIC EVALUATION OF RAGI COOKIES PREPARED WITH INCORPORATION OF OKARA FLOUR AND PANDAN LEAVE EXTRACT** 33-38  
*Ms. Sakshi M. Desai Ms. Shreya M. Chougule, Ms. Shrushti V. Katkar, Ms. Surabhi A. Daddikar, Ms. Sukanya M. Vhatkar, Ms. Tirtha B. Ingavale Ms. Utkarsha S. Banadar*
- 8 **POTENTIAL OF FINGER MILLET (ELUESINE CORACANA): A REVIEW ON ITS NUTRITIONAL COMPOSITION AND HEALTH BENEFITS** 39-44  
✓ *Ms. Shweta A. Patil, Dr. Iranna S. Udachan*





22	<b>PEARL MILLET AS FUNCTIONAL FOOD: A REVIEW.</b> <i>Divya Satpute , Nikita Samudre, Manasi Sarnaik, Amruta Satpute, Rasika Yadav</i>	115-118
23	<b>FORMULATION OF READY TO COOK SOUP MIX BY WASTE UTILIZATION OF BEETROOT GREENS AND BANANA PEELS</b> <i>Divya Satpute, Nikita Patil, Shreya Kadam, Chaitrali Patil, Ashlesha Jadhav, Pranali Patil, Priyanka Shirke</i>	119-124
24	<b>DEVELOPMENT OF MOODLES SUPPLEMENTED WITH UNDERUTILIZED VEGETABLE LEAVES</b> <i>Yogita Mirajkar, Vaishnavi Patil , Samruddhi Pednekar, Shriya Pardeshi , Nikita Chopade , Rutuja More , Rajnandini Teli</i>	125-131
25	<b>INCORPORATION OF MORINGA LEAVES IN MULTI GRAIN FLAT BREAD (PREMIX)</b> <i>Ms. Ashiwini S. Raibagkar , Ayuti S Patil, Chaitrali P Patil, Gouri Y Patil, Nayana Chougule, Pratiksha B. Mane, Shivani E Lingayat</i>	132-137
26	<b>STUDIES ON THE POTENTIAL OF MILLET CRISPIES FOR THE DEVELOPMENT OF MILLET-BASED GRANOLA BAR</b> <i>Dhaneshwari Karnavat , Deepti Chaudhari , Anjali Bhoite</i>	138-144
27	<b>OPTIMIZATION OF MILLET CAKE USING UNDER-UTILIZED WHEAT GRASS EXTRACT</b> <i>S Gayatri Rahul, J Divya Digambar, S Manasi Keshav, P Sunaina Prakash, S Supriya Somashekhar, S Ishwari Jaykumar, M Manasi Sachin</i>	145-149
28	<b>DEVELOPMENT OF FOXTAIL MILLET CRACKER</b> <i>Diksha Jadhav , Chaitali Kulkarni, Pranali Askar, Poonam Chavan, Iramna Udachan</i>	150-155
29	<b>DEVELOPMENT AND INCORPORATION OF MORINGA LEAVES POWDER INTO CHOCO PIE</b> <i>Priyanka Gotur , Mrunal Powar , Sayali Patil , Mrunal Patil , Samreen Mulla, Sakshi Chikane , Saima Nalband , Shrushti Vankundre</i>	156-162
30	<b>NUTRITIVE VALUE OF MILLETS: AN OVERVIEW</b> <i>Mrs. Ashwini Raibagkar, Muskan Makandar, Sanam Khalipha, Suhana Sayyad ,Mariya Shaikh, Mahek Kavathekar, Riya Kamble</i>	163-166
31	<b>SERVING HIGH PROFILE NUTRITIOUS CAKE: REPLACING WHEAT FLOUR WITH FINGER MILLET FLOUR AND ALMOND FLOUR</b> <i>Bhavana Daryani &amp; Mrs. Neelam Swapnil Jirage</i>	167-174
32	<b>A REVIEW ON EMERGING TECHNOLOGIES APPLIED FOR PEARL MILLET</b> <i>Divya S. Satpute, Shreya V. Upadhye, Rutuja S. Mahajan, Sai S. Patil, Sejal P. Paste, Yashshri S. Patil, Pooja D. Sankpal</i>	175-177
33	<b>REVIEW ON NUTRITIONAL VALUE AND HEALTH BENEFITS OF RAGI AND PERAL MILLETS AS AN INTEGRAL PART OF INDIAN DIET</b> <i>Sugandhi Gayatri , Kulkarni Vaishnavi , Pednekar Aditi, Patil Shweta, Patil Sayali , Shinde Siddhi , Patil Pradnya</i>	178-184





## POTENTIAL OF FINGER MILLET (*ELUESINE CORACANA*): A REVIEW ON ITS NUTRITIONAL COMPOSITION AND HEALTH BENEFITS

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### Abstract

Millets are a group of small grained cereal food crops being highly tolerant to drought and other extreme weather conditions. These can be grown with low chemical inputs using fertilizers and pesticides. Most of millet crops are native of India and are commonly known as "Nutri-cereals" as they provide vital nutrients required for the normal functioning of human body. Ragi, commonly known as Finger millet is one of the major millets grown in many states of India. Now-a-days there has been increasing demand for the consumption of Ragi as whole and its value-added products. The nutritional composition of finger millet showed that total carbohydrate content of finger millet has been reported to be in the range of 70 to 78.5%, approx. 7.5% protein with large variations in protein content from 5.2 to 12.80% which have been reported by various studies. The total ash content has been reported to be nearly 1.7 to 4.13% in finger millet. Calcium content ranged from  $361.87 \pm 50$  mg to  $363.87 \pm 22.45$  mg, whereas magnesium was found to be  $96.0 \pm 0.78$  mg to  $98.08 \pm 0.45$  mg. The different varieties of Finger millet showed high percentages of iron ranging between 3.61 to 5.50 mg. Apart from these nutrients, finger millet also provides some anti-nutrients such as phytates, phenols, tannins and enzyme inhibitors which are lowered during various processing treatments. Thus, it helps in decreasing their anti-nutritional effect and simultaneously increasing bioavailability of calcium and iron. Finger millet being gluten free and low glycaemic index food serves several health benefits and hence, is found to have applications in many formulated products.

**Keywords:** Finger millet, nutritional composition, formulated products, antinutrients, glycaemic index.

### Introduction:

Millets are traditional grains, grown and consumed in the Indian subcontinental areas. Millets are small grains, grown in warm weathers and drought conditions with minimum inputs of chemical fertilizers and pesticides. They are nutri-cereals comprising of sorghum, pearl millet, finger millet, foxtail, proso, kodo and barnyard millet. Nutritionally, millets are equivalent to other cereal grains [FAO, 1995] and has potential health benefits in management of diabetes mellitus, obesity and hyperlipidemia [Takhellambam *et al.*, 2016]. The human health is related with the nutritional well-being, a sustainable force for health and development of human gene metabolism. The nutritional status of a community has therefore been considered as an important indicator of national development. Though several millet varieties are available, finger millet is often mentioned separately from other small millets as it has thrice the amount of calcium as milk which is important for women and babies. In addition, low glycemic index and gluten free nature of finger millet grains represent as an ideal food for peoples suffering from celiac disease and diabetes [Ramashia *et al.*, 2019]. Thus, finger millet is a good source of diet for growing children, lactating women, old age people and patients [Desai *et al.*, 2010]. Through nutritional point of view, the protein-energy malnutrition is still a major public health issue in developing countries and is mostly associated with 50-60% of under-five mortality [Faruque *et al.*, 2008, Muller *et al.*, 2005]. To overcome this problem of malnutrition, there is need for



**DEVELOPMENT OF GLUTEN-FREE COOKIES INCORPORATED WITH *MUSA SPP.***

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**Abstract**

Bakery industry is considered as one of the major segments of food processing sector in India. Cookies among the bakery products are most significant in the world. Cookies are a very popular snacks food among all age group, especially in children. In the recent year, there has been increase in customer awareness regarding the choice for nutritious cookies. Celiac disease results in damage to the small intestine lining due to consumption of gluten containing products. The present investigation is an attempt to formulate high nutritional value gluten-free cookies incorporated with Buck wheat flour, Ragi Flour, Bajra flour, Oats flour and additional ingredient i.e. Banana blossom (*Musa spp*) flower powder. Banana blossom are excellent source of vitamins, minerals, fibre and protein. Besides they are also excellent source of certain phytochemicals which acts as antioxidants. Hence, attempt was made to incorporate these in gluten-free cookies. The proximate analysis and sensory evaluation of gluten-free cookies were conducted by standard methods. Sensory evaluation of gluten-free cookies was studied using 9- point hedonic scale method. The developed gluten-free cookies were found to contain

**Keywords:** Gluten-free, Celiac, Banana blossom, Sensory evaluation, Proximate analysis.

**I. Introduction:**

Millets are termed as "yesterday's coarse grain and today's nutria cereals." Indian dominates the global production of millets with total share of about 40.62% and estimated production of about 10.91 million tonnes during 2018 -2019. (Rao D.B et al 2017) The majority of millets are three to five time more nutritious than most of the cereals. (Ashoka P et al 2020) The nutri-rich millets are the viable solution to reduce the rising incidence of malnutrition and metabolic disorders and can enhance the nutrition and food security of the country. Millets are rich in vitamin E and vitamin B and in minerals such as calcium, phosphorus, magnesium, manganese, potassium and iron. Millets are usually processed before consumption to remove the inedible portion, extend the self-life, and improve nutrition and sensory properties. (Birania S et al 2020)

Cookies are popular baked product due to their low manufacturing cost, convenience, and long shelf-life. (Onwurafor, et al 2019) The awareness to consume high quality and healthy food has increased the demand for functional foods, which contain ingredients that provide additional health benefits beyond the basic nutritional requirement. (J. Ndife, E. et al 2009)

The challenge is to develop traditional cookies, a higher consumed bakery product. Consumer awareness of the functional characteristics of the food products is increasing, which is influencing their purchasing decisions, with the functional food market increase at about to a 10 % a year (Piteira MF et al 2006)

Nowadays development of fortified cookies or other composite flour bakery products is the latest trend in bakery industry. "Therefore, combining different whole grains in multigrain mix has an added nutritional advantage of mutual Supplementation of amino acids and thereby improving the quality and quantity of protein, dietary fiber in addition to increase in other nutrients like vitamin, minerals, etc.



**NUTRITIVE VALUE OF MILLETS: AN OVERVIEW****<sup>1</sup>Mrs. Ashwini Raibagkar.***Department of Food Technology, CNCVCW, CSIBER, Kolhapur***<sup>2</sup>Muskan Makandar<sup>3</sup>Sanam Khalipha.<sup>4</sup>Suhana Sayyad.<sup>5</sup>Mariya Shaikh,****<sup>6</sup>Mahek Kavathekar.<sup>7</sup>Riya Kamble***Under graduate student of B.Sc. Food Technology Management, College of Non-Conventional Vocational Courses for Women, CSIBER, Kolhapur.***Abstract**

*Millet's are the first cereal to be used for domestic purpose. Millets are rich in proteins, fibre, B vitamins, calcium, iron, potassium, magnesium and zinc. Millets are gluten free thus useful for people suffering from gluten sensitivity. Millets have low-GI (Glycemic index) thus millets are suitable for diabetic, weight loss and in weight. Millets are also having characteristics like drought tolerance and resilient to climate change etc.. Hence developing technology that makes value added products using millets in the form of convenience foods and easy access at reasonable price is a need of time. This review provides information about nutritive value and health benefits of millets. This will benefit to the entrepreneurs to initiate business on millet processing for utilization. The production and promotion of various millet products in the market is very much essential.*

*Key words-gluten sensitivity, glycemic index, convenience foods*

**INTRODUCTION:**

Millet's are traditionally grown in resources poor agro-climate regions of the country which includes sorghum, barley, ragi, bajra, rajgira. They are nutriceals which are highly nutritious and known to have high nutrient content which includes proteins, essential fatty acids, dietary fibers, B vitamins and minerals such as calcium, iron, zinc, potassium, magnesium. The word 'millet's has originated from the french word "MILE" meaning thousands which implies a handful of millet's content thousands of grains. Millet's are often growth in semi-arid condition with very less rainfall and marginal or degraded lands with very low nutrient contents. The crop support the livelihood of people in areas where famine is a regular phenomenon and the millet's yield a more dependable harvest compared to other crops in low rainfall areas. Millet's are plants with very superior photosynthetic efficiency, short duration, higher dry matter production capacity and a high degree of tolerance to heat and drought. They also easily adapt to degraded saline, acidic and aluminum toxic soils. These extraordinary characters of millet's



**INCORPORATION OF MORINGA LEAVES IN MULTI GRAIN FLAT BREAD (PREMIX)****<sup>1</sup>Ms. Ashiwini S. Raibagkar**

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Under Graduate Student of B.Sc. Food Technology Management, CNCVCW, CSIBER, Kolhapur.

**Abstract**

Wheat bread is Staple food used all over the world since dawn of agriculture With the passage of time and awareness about nutritious food, this concept of bread made from only wheat flour is changed to multigrain flat bread. It is the favorite traditional food that can be consumed by all age groups It is called by the name Thalipeet which is popular in Western India, particularly Maharashtra and prepared from roasted grains and legumes. The research study was aimed to develop an premix of Multigrain Flat Bread incorporated with moringa leaves (Moringa thalipeet) to fulfill the increasing demand for a healthy diet and to increase the utilization of millets. Different combinations of millets, grains, legumes flour and dried moringa leaves were tried for the preparation of instant mix. The final test sample was set up with 40% jowar flour, 20% bengal gram flour, 20% green gram flour, 10% bajara flour and 10% rice flour and 15 grams of dried moringa leaves. The test sample was compared with control sample by sensory evaluation and chemical analysis. The test sample was found to be acceptable and chemical analysis of test sample showed 14.87% protein, 0.54% fat, 72.40% carbohydrate, 141.55mg calcium and 1.60 mg iron whereas the chemical analysis of control sample showed 13.90% protein, 0.25% fat, 71.56% carbohydrate, 141.54mg calcium and 0.916 mg iron. Thus test sample reveals increase in protein and iron content

**KEY WORDS :** moringa leaves, sensory evaluation, proximate analysis, anti-oxidants.**1. INTRODUCTION**

Moringa thalipeet is a savoury, nutritious and traditional breakfast food usually served along with curd or butter. In the multigrain moringa premix, moringa is the main ingredient of study used along with other flours such as jowar, bajara, bengal gram, green gram, and rice flour to increase the nutritive value of the product and some spices to enhance the flavour like ginger powder, garlic powder, green chilli powder.

The most widely cultivated species is Moringa Oleifera. MO has been recognized as containing a great number of bioactive compounds. The most used parts of the plant are the leaves, which are rich in vitamins, carotenoids, polyphenols, phenolic acids, flavonoids, alkaloids, glucosinolates, isothiocyanates, tannins and saponins. Moringa leaves contain all of the essential amino acids, The young leaves are exceptionally good source of provitamin A, vitamins B, and C, minerals (in particularly iron), and the sulphur-containing amino acids methionine and cystine. Since the dried leaves are concentrated; they contain higher amounts of many of these nutrients.

Jowar contains a much higher concentration of fiber. A high-fiber diet lowers the risk of obesity, stroke, high blood pressure, cardiac disease, diabetes, and digestive problems. Jowar is high in Protein which aids in cell regeneration.

Bajra is rich in omega-3 fats, magnesium, potassium, fiber, and plant lignans. Omega-3 fats help lower blood pressure, triglycerides, and also regulate heart rate. Magnesium helps control glucose receptors in our body and reduces insulin resistance Potassium helps lower blood pressure because it is a good vasodilator. Fiber reduces bad cholesterol and thus protects the heart.





## SERVING HIGH PROFILE NUTRITIOUS CAKE: REPLACING WHEAT FLOUR WITH FINGER MILLET FLOUR AND ALMOND FLOUR

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### Abstract

**Background:** Vegetarian and gluten free diet are gaining upheaval all over the globe with respect to nutritional benefits and healthy lifestyle modification. With the magnifying diet trends a demand for modified products of high nutritious profile is rising.

**Aim:** The aim of the study was to develop gluten free vegetarian cake enriched with finger millet, almond flour and assess its overall acceptability compared to vegetarian cake available commercially.

**Method:** Gluten free cake was enriched with finger millet, almond flour and flaxseeds against a commercially available vegetarian cake. Sensory trails on flavor profile were considered using 9 point hedonic scale on 10 panelists. Minimum good acceptance range considered was 80% and above. Nutritive value of the cake was determined by proximate analysis. The shelf life of the product was checked by observing staling of cake and evaluating change in texture of product at room temperature. The overall acceptability of the developed product was checked against the control product statistically using paired t test.

**Result:** The experiment and the control product had sensory acceptability of 84% and 83% respectively. There was no significant difference between the overall acceptability scores of two products ( $p > 0.05$ ). The proximate analysis suggested the experiment cake was high in calorie, protein, iron, calcium and fiber compared to control cake per 100grams of the product. The shelf life of control and experiment cake was three days at room temperature.

**Conclusion:** The developed cake has a good scalability as nutritious alternative to the other cakes available in market.

**Key Words:** Gluten free cake, Finger millet, Almond flour, Flaxseeds.

## INTRODUCTION

Nutrient dense recipes demand is magnifying with increase in awareness regarding cons of consuming unhealthy and low nutrient profile food items. Nutritious dense food products are high in macro and micro-nutrients and rich in antioxidants. They contain more of complex carbohydrates, high in protein and essential fatty acids. Gluten free diet excludes any food that contains gluten, which is a protein found in wheat and several other grains like rye, barley, etc. A gluten free diet helps manage symptoms of Celiac disease and other medical conditions associated with gluten consumption. In India, celiac disease is more prevalent in Northern India, where wheat is the staple food. Increase in nutritiously





## DEVELOPMENT AND FORMULATION OF FASTING (UPWAS) INSTANT MILLET KHEER-MIX

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### Abstract

Kheer, also known as Payasam is one of the most famous and authentic milk based dessert in India. It is usually made from partial dehydration of milk with sugar and rice or sago. This study was conducted with the objective to develop an instant Kheer mix for fast. We have formulated a Fasting instant millet kheer mix using two of the underutilized millets i.e. proso millet and amaranth. Other ingredients used are desiccated coconut, milk powder, nuts (cashew and almond), garden cress seeds, and powdered sugar. Proso millet is parboiled and amaranth is soaked in warm water to make them easy to cook. The nutritive value of prepared instant millet kheer was: energy (404.9 kcal), protein (11.62%), fat (8.73%), carbohydrates (70.31%), and moisture (5.77%). Therefore, the use of these millets used in kheer increases the nutritional value of the product. The kheer with desired consistency was prepared by reconstituting 50g of ready mix in 250 ml of water and further cooking for 15 minutes. The cost of control kheer was found to be the lowest as compared to the other samples. The highest cost was recorded for sample A as Rs. 498.77/Kg, whereas the selected sample cost was Rs. 446.83/kg.

**Keywords:** Instant kheer mix, proso millet, amaranth, fast, sensory analysis

### INTRODUCTION:

Kheer is a traditional Indian dessert conventionally prepared food by partial dehydration of whole milk over direct fire together with sugar and usually rice or semolina<sup>[1]</sup>. The development of ready-to-cook mix for several traditional desserts and snack foods is offering convenience to food industries and housewives and is becoming a fast-growing trend among processed foods. Kheer is a highly popular milk based food item in the Indian subcontinent, irrespective of urban and rural areas<sup>[2]</sup>. Many milk based convenience foods are available in the market<sup>[3]</sup>. But the availability of instant traditional desserts is very less. So, this work was conducted with the objective to develop an instant kheer-mix.

Proso millet (*Panicum miliaceum L.*) is an important cereal and a valuable component of the human diet, particularly in developing countries<sup>[4]</sup>. Its grains are mainly used for food in the decorticated form. Traditionally proso millet quality has been evaluated on the basis of nutritional value, such as starch<sup>[5]</sup> and crude protein content<sup>[6]</sup>. It has several health benefits. It reduces the risk of elevated serum cholesterol<sup>[7]</sup>, cardiovascular diseases<sup>[8]</sup>, type II diabetes mellitus<sup>[9]</sup> and liver injury<sup>[10]</sup>. It contains a good amount of protein and also a very good amount of B complex vitamins such as niacin, biotin, and folic acid. It is also a good source of lecithin. Amaranth is from the family of *Amaranthaceae*. The genus amaranth is mainly comprised of about 400 species among them four important species are *A. hypocondricus*, *A. cruentus*, *A. caudatus*, *A. edulis*<sup>[11]</sup>. It is highly nutritious; both the amaranth grain and leaves are utilized for human as well as for animal food<sup>[12]</sup>. It has a very good amino acid profile. It has antioxidant, antithrombotic, cholesterol lowering, and immune regulatory properties. The storage proteins of amaranth also have good film forming, foaming, and emulsifying properties as well as good water retention capacity<sup>[13]</sup>. Amaranth is easy to digest as it is gluten-free grain. About 90% of amaranth grain is digestible. It is traditionally been used for patients who are recovering from long fasting period or illnesses<sup>[14]</sup>. Desiccated coconut is the dried, separated and dehydrated kernel from mature coconuts.





## A STUDY ON DEVELOPMENT OF MILLET BASED SNACK FOOD: MULTI MILLET NACHOS

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### Abstract

The study aimed to develop a nutritious snack (multi-millet nachos). Snacks help as a bridge between meals and prevent excessive hunger. Nachos are most commonly consumed snack. Generally nachos are prepared using maize flour and refined wheat flour and are fried. In the present study, nachos were baked using different germinated millets flour (Finger millet, sorghum, proso millet, little millet, kodo millet, foxtail millet) with the addition of Black cumin seed (a natural remedy for a number of illnesses). Millets are gluten free grain and low in glycaemic index, also excellent source of macronutrients like fibre and protein along with vitamins and minerals such as calcium and iron. Soaking and germination improves the nutritional quality of millet grain flour. Black cumin seed is medicinal plant used since ancient times as therapeutic agent for the treatment of various disease. Physico-chemical analysis of multi millet nachos shows 11.42% protein, 68.68% carbohydrates, 235.45mg calcium, 2.60mg iron, 1.71% crude fibre, and 1.40% ash and gives 410.40Kcal energy.

**Keywords:** Multi millet nachos, germinated millet flours, Black cumin seed, Glycaemic index

### INTRODUCTION

Nachos are a Mexican culinary dish consisting of fried tortilla chips covered with melted cheese or cheese sauce, as well as a variety of other toppings. Tortilla chip is a snack food made from maize flour, and refined wheat flour, which is cut into triangles and fried. These are made from maize flour, and refined wheat flour which is high in calories, fat, & sodium making them an unhealthy snack. The main aim of this study is to make it healthier snack and know the health benefits of millet study aimed to prepare multi millet nachos. Nachos were baked products made from both major and minor millet flour (Sorghum, Finger, Proso, Foxtail, Little, Kodo), black cumin seed, salt with herbs and spices (oregano, chili flakes).

Finger millet is rich in iron, calcium, fibre, phosphorous, protein, and vitamins. Ragi has the best quality protein along with the presence of essential amino acids, vitamin A, and phosphorous (1).

Therefore, ragi is the beneficial diet for growing children, expecting women and also for old age people. Traditionally ragi is processed either by malting or fermentation (2).

Sorghum is significant source of protein, energy, and minerals. It contains large number of polyphenolic compounds which combine with other flavonoids (anthocyanin, anthocyanids, etc). It also contains B-complex vitamins (thiamine, niacin, and riboflavin). Despite of nutrient in sorghum grain it also contains anti nutritional factors such as tannin, phytic acid, polyphenol and trypsin inhibitor which bind these food ingredients into the complex making them unavailable to human nutrition (3). The presence of anti-nutritional factors limits the digestibility of protein and carbohydrates by inhibiting their





**DEVELOPMENT OF MOODLES SUPPLEMENTED WITH UNDERUTILIZED VEGETABLE LEAVES****Yogita Mirajkar <sup>1</sup>,**<sup>1</sup>Assistant Professor, Department of Food Technology, CNCVCW, CSIBER, Kolhapur.**Vaishnavi Patil <sup>2</sup>, Samruddhi Pednekar <sup>3</sup>, Shriya Pardeshi <sup>4</sup>, Nikita Chopade <sup>5</sup>,****Rutuja More <sup>6</sup>, Rajnandini Tehi <sup>7</sup>.**<sup>2-7</sup>PG Students, Department of Food Technology, CNCVCW, CSIBER, Kolhapur.**Abstract**

Nowadays millets-based products consumption was very low. This study was carried out to increase the consumption of millets with the most common product Noodles. Traditional noodles are usually made from Wheat flour, Water, and Salt. Hence the more use of underutilized millet in the form of ready-to-cook noodles we formulated MOODLES. The moodles are made up of multi millets flour i.e. (Foxtail millet, Kodo millet, Proso millet, Barnyard millet, and Little millet flour) these millets (are soaked overnight) to make them rich in nutrient content. Guar gum was optimized by varying proportions to result in better quality moodles. The nutritive value of prepared moodles was Energy (368.83kcal), Protein (11.89%), Fat (4.55%), Carbohydrates (70.08%), Moisture (10.70%), Fiber (1.11%), Calcium (220mg), Iron (2.70mg). Millets are rich in protein, dietary fiber, and B complex vitamins and minerals. The moodles prepared with multi millets flour increase the nutritional value of the product.

**Keywords:** Noodles, Vegetable leaves, Multi Millets flour, Moodles, Proximate analysis, and Sensory analysis.

**1. Introduction**

A ready-to-cook, one-pot meal mix of foods is popular and in demand due to convenience, time-saving, and requires no skill preparation. Nutrition is the key factor to look at such convenience foods. Noodles based on wheat are prepared mainly from three basic ingredients; flour, water, and salt [1]. Generally, noodles are made up of refined wheat flour, hence the more use of underutilized millet in the form of ready-to-cook noodles we formulated Moodles. The moodles were formulated and developed by blending the flour from millets (Foxtail millets, Kodo millet, Barnyard millet, Proso millet, and Little millet) with dehydrated vegetable leaves like Beetroot leaves, Pumpkin leaves, Radish leaves, and other ingredients (Salt, thickening agent, oil) in the optimized proportion. Several trials have been performed by varying the proportion of ingredients. The nutritional significance of different millets is very useful in developing value-added products.

Foxtail millets contain a significant level of Protein, Fiber, Minerals, and Phytochemicals. It is rich in essential amino acids, fatty acids, and minerals and is considered to be one of the most digestible and non-allergenic grains available, and has significantly important human health [2]. Kodo millet is rich in dietary fiber and minerals like iron, and antioxidants. The Protein, Fiber, and Minerals contain are much higher. Kodo millet is an excellent source of fiber [3].

Barnyard millet grain is a good source of Protein, Carbohydrate, Fiber and contain Micronutrients (Iron and Zinc) compared to major cereals. In addition, barnyard millet is also a well-known source of major fatty acids including Palmitic, Linoleic, and Oleic acids [4]. Proso millet has multiple benefits when consumed as human food. Proso millet is rich in minerals, dietary fiber, polyphenols, vitamins, and proteins. Proso millets contain high Lecithin which supports the neutral health system [5]. Little millet





**PEARL MILLET AS FUNCTIONAL FOOD: A REVIEW.****Divya Satpute***College of Non-Conventional Vocational Courses for Women, Kolhapur.***Nikita Samudre, Manasi Sarnaik, Amruta Satpute, Rasika Yadav***College of Non-Conventional Vocational Courses for Women, Kolhapur.***Abstract**

*Pearl Millet (PennisetumGlaucum) is locally known as bajra. It is drought resistant crop and gives good productivity in areas with low rainfall, low soil fertility and high temperature. Pearl millet is considered as poor man's cereals. Pearl millet is nutritionally comparable and even superior to major cereals with respect protein, energy, vitamins and mineral. Pearl millet is rich source of phytochemicals and micronutrients that plays an important role in our immune system. Pearl millet has antioxidant properties which helps to reduce blood pressure, risk of heart disease, diabetes, prevention of cancer and cardio vascular diseases. Other health benefits are high fibre which helps to dealing with constipation, high amount of iron. All these characteristics of pearl millet makes it good source of functional food.*

*Keywords: Pearl millet, nutritional composition, health benefits, functional property.*

**Introduction**

The functional food are primarily designed to have finer metabolism and it has good biological value, which helps in treatment of chronic diseases. Functional food can be considered to be those whole, fortified, enriched, enhanced foods that provide health benefits when they are consumes with a diet on a regular basis (Jedrusek- Golinska et al. 2020). Millet are cultivated in tropical areas, having minimum fertility of soil. in many of the advance countries millets are consumed as primary food. Millets are nutricereals, the major millets are sorghum, finger millet, pearl millet while minor millets are foxtail millet, kodo millet, proso millet, barnyard millet ( Singh et al. 2018).

**Pearl Millet**

Pearl millet is an important tropical cereal crop. The scientific name of Pearl millet *PennisetumGlaucum* (L.)R.Br). It belongs to the family Grammineae and is commonly known as Bajra. Pearl millet can be grown in harsh and dry climate. It is grown in medium black soil, it needs less water and low pH. The plant reaches physiological maturity by 75-85 days. It is cultivated in countries like Africa, China, Arabia, Pakistan. In India state of Rajasthan, Maharashtra, Gujrat, Hariyana Uttar Pradesh are 90% total area covered under pearl millet (Arora et al. 2003).

Malting of pearl millet help in absorption of protein and also improve availability of protein in human body, several traditional as well as current food products made form germinated pearl millet flour as a functional food. Pearl millet is rich in resistant starch, insoluble and soluble dietary fibre and minerals and antioxidants (Ragae et al. 2006).

Pearl millet grain is gluten free. Protein content is also high, the essential amino acids profile shows more glycine threonine, methionine, cysteine in pearl millet proteins. pericarp,

aleurone layer and germ are important source of minerals like thiamine, niacin and riboflavin which are located in germ ( Rooney et al.1987).

Structure of Pearl Millet



**FORMULATION OF READY TO COOK SOUP MIX BY WASTE UTILIZATION OF BEETROOT GREENS AND BANANA PEELS**

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**Abstract**

This research consists of formulation of RTC soup mix by waste utilization of beetroot greens and banana peels by addition of sorghum millet flour. This study was aimed to develop dehydrated Ready to Cook soup mix to save preparation time. The ingredients such as beetroot greens, banana peels, lentils, ginger-garlic, carrots were dehydrated in tray drier using established procedure. The optimum concentrate of beetroot greens, banana peels, sorghum flour, corn flour was determined by carrying out preliminary trails and were evaluated using 9-point hedonic scale sensory evaluation test. Proximate analysis revealed the soup mix respectively contains moisture 9.85%, protein 12.42%, energy 354.90 kCal carbohydrates 70.41%, total fat 2.62%, calcium 72.52mg, iron 3.80mg and crude fibers 8.50%.

**Key words:** Ready to Cook, Dehydrated vegetables, sorghum millet flour, soup mix.

**1. Introduction**

Soup is one of the traditional foods which can be consumed for its appetizing action. Soup is generally made by combining ingredients such as vegetables/vegetable juice, water. Dried soup powders have an advantage of protection from enzymatic and oxidative spoilage and flavor stability at room temperature over a long period of time (6-12 months). Soup is nutritious and can help to lower calories in diet. Dry soup mix came into vogue in 1930's. By that time, "soup cakes" or "portable soup" – an 18th century creation made by slowly boiling soup down to a go which hardened was passed considering the popularity of condensed canned soups, Campbell's being chief among them. (Ansari F. et al. 2020). Food drying is a method of preservation by means of removal of water (through heat and mass transfer process) basically free water which is responsible for water activity for growth and multiplication of microorganisms. Hence drying leads to extension of shelf life of food commodities such as vegetables, lowering down the water content to expectable limit. The drying time, temperature and water activity influence the quality of final product. (Bisht A. et al. 2022) Beetroot leaves stems are also one of the most underutilized vegetables that are highly nutritious. The iron content of beetroot leaves and stem is better than that of spinach. It has been assumed that nutritional composition of beetroot leaves

And stems are like beetroot, which is rich in carbohydrates, protein, fiber many minerals such as sodium, potassium, calcium as well as iron, some of the phytonutrients present in that which include polyphenols, carotenoids, beta xanthine's, betacyanin (Singh R. et al. 2021). Sorghum is fifth most important crop in the world. It is a staple food of Africa and a good supply of energy, protein, vitamins and minerals. Sorghum has higher content of polyphenols than wheat, barley, millet, or rye, with phenolic acids, flavonoids, condensed tannins, and deoxyanthocyanins being the predominant compound. (Svensson L. et al. 2010).





**A REVIEW ON EMERGING TECHNOLOGIES APPLIED FOR PEARL MILLET****<sup>1</sup>Divya S. Satpute.**<sup>1</sup>Assistant Professor College of Non-Conventional Vocational Courses for Women, Department of Food Technology, Kolhapur.**<sup>2</sup>Shreya V. Upadhye, <sup>3</sup>Rutuja S. Mahajan, <sup>4</sup>Sai S. Patil, <sup>5</sup>Sejal P. Paste, <sup>6</sup>Yashshri S. Patil, <sup>7</sup>Pooja D. Sankpal**<sup>2-7</sup>UG students College of Non-Conventional Vocational Courses For Women, Department of Food Technology, Kolhapur.**Abstract**

Pearl millet supplies a major proportion of calories and protein to the large segments of populations living in the semi arid tropical regions of Africa and Asia. This crop is adapted to heat and aridity. Pearl millets are genetically modified for various conditions like tolerance to drought, enhanced nutritional quality, adaptation to saline conditions and resistance to major pearl millet diseases such as downy mildew, ergot, smut, rust, and head mold of pearl millet. The different technologies like tissue culture, genetic modification and plant breeding are important in green revolution process. Pearl millet plays an important role in the development of agriculture in many countries and is the main food source. This grain has relatively good mineral and protein content than other common cereals. Pearl millet ranks third after rice and wheat and has cultivated more than 8 million hectares in India. It is an important resource and a valuable source of animal feed for human consumption. Pearl millet is also used for non-food purposes such as poultry, cattle feed and alcohol extraction. Currently, more than 65% of the pearl millet area is under improved farmers. Various processing technologies have been developed to popularize traditional and healthy food products based on pearl millet. Pearl millet improvement research in India is conducted by the All India Coordinated Pearl Millet Improvement Project (AICPMIP) under the protection of the Indian Council of Agricultural Research (ICAR).

**Keyword-** Pearl Millet, *Pennisetum glaucum*, Nutrition, Crops, Value addition, Improved technology.

**Introduction-**

Pearl millet (*Pennisetum glaucum*) is known as world's largest warm season crop. It is a good source of energy, protein, iron and zinc. This type of millet is most widely grown. It is grown under the conditions such as lack of rain, low soil fertility and also due to the high temperature.

Pearl millets are grown in areas where cereal crops would not survive. Example: maize, wheat. Pearl millet is a staple food for farming households and poor people in country. This crop is mainly consumed in India and Africa. It is used as valuable livestock feed in growing regions of India and Africa. Because of its low demand exports and imports are very low. In 1970 the production of pearl millet in India was characterized with marketable surplus (Gali *et al.* 2010). In India pearl millet is called as Bajra. It is mainly grown in rainfall areas (200-500mm). Normal temperature for growth of Bajra is about 30°C. About around 10 million hectares of area is under pearl millet cultivation. Pearl millet is known by different names according to different region like pearl millet in English, *Pennisetum*



**FORMULATION AND ORGANOLEPTIC EVALUATION OF RAGI MILLET PAPAD PREPARED WITH INCORPORATION OF WOOD APPLE POWDER (LIMONIA ACIDISSIMA)**

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**Abstract**

*This present work was undertaken to study formulation and organoleptic evaluation of ragi papad incorporated with wood apple powder. The formulation for preparation of ragi papad was carried out by using rice flour, wood apple powder and at different proportions via, 30:40:30, 40:40:20 and 50:30:20 respectively. Further, prepared papad were dehydrated and fried which was subjected for organoleptic evaluation by using 9 points hedonic scale. Results revealed that sample containing 50:30:20 both toasted and fried received high sensory score (8.5) and was found superior followed by sample 30:40:30 compared to other sample. It was observed that there was significant variation found among the treatments. Overall, it can be concluded that supplementation of wood apple powder up to 20% in preparation of papad with good sensory attributes and nutritional value can be prepared.*

**Keywords:** Wood apple, Rice flour, Ragi flour, papad, Organoleptic evaluation, hedonic scale.

**Introduction:**

Papads are an important part of South Asian cuisine. Recipes vary from region to region and family to family but typically it is made from lentil, chick pea, black gram or rice flour. Papad are typically served as an accompaniment to the meal in India. It is also eaten as an appetizer or a snack and can be eaten with various toppings such as chopped onion chutney or other dips and condiments. The purpose of this study was to produce ready-to-eat nutritious papad by incorporating ragi and wood apple, along with a view to determine the organoleptic acceptability.

Ragi is one of the ancient millet in India. Ragi was a well domesticated plant in various states of India and popularly called as Nachani in state of Maharashtra. Of all the cereal and millet, Ragi has highest amount of calcium (344mg %) and potassium (480mg %). It has higher dietary fibre mineral and sulphur containing amino acid compared to white rice, the current major staple in India. The kernel of ragi mainly consists of seed coat, embryo and endosperm. It has five layer of seed coat which high in antioxidant and dietary fibre. Ragi contains carbohydrate 81.5%, dietary fibre 18 to 20 % starch 65 to 75%, protein 9.8%, fat 1 to 1.7%, mineral 2.7% that is equivalent to the other millets and cereals[1,2]. Rice (*Oryza Sativa*) is a dietary staple foods. Rice is one of the three major crops in the world and is the major crop in Asia. The nutrient contain of rice were rice depending on a variety of soil and condition they grow. Rice contributes to the major dietary energy for body. Peregrinated brown rice has protein 2 times more than white rice i.e. 14.6gm/100gm (brown rice) vs. 7.3 gm/100gm (white rice). Rice is good source of thymine (vit.B1), riboflavin (vit.B2) and niacin (vit.B3). Rice is the rich source of mineral and protein. The nutrient contain as well as the sensory attributes of brown rice(0% polish) versus rice milled to different degrees of polish (2.3,4.4and 8.0%). Climate change and water resource shortages may result in decreases in rice yield possible food shortage crises[4,8].





13

**FORMULATION AND ORGANOLEPTIC EVALUATION OF RAGI COOKIES PREPARED WITH INCORPORATION OF OKARA FLOUR AND PANDAN LEAVE EXTRACT****Ms. Sakshi M. Desai<sup>1</sup>***Assistant professor- Department of Food Technology, CNCVCW, CSIBER, Kolhapur***Ms. Shreya M. Chougule<sup>2</sup>, Ms. Shrushti V. Katkar<sup>3</sup>, Ms. Surabhi A. Daddikar<sup>4</sup>,****Ms. Sukanya M. Vhatkar<sup>5</sup>, Ms. Tirtha B. Ingavale<sup>6</sup>, Ms. Utkarsha S. Banadar<sup>7</sup>***UG Students of B.Sc. Food Technology and Management – III Year, Department of Food technology, CNCVCW, CSIBER, Kolhapur.***Abstract**

*Okara is the byproduct of soy milk and is derived from tofu manufacture process. It is nutritional thus has great potential to be applied in healthy snack. Whereas pandan leaves are promising source of natural colourant as well as natural flavourant. This research study was conducted to identify most suitable blends of okara flour as a partial replacement of refined wheat flour. The incorporation of okara increased protein and fiber content. Ragi is nutritionally superior to wheat and rice, because of its high calcium, dietary fibre and phenolic compounds. Flaxseeds in our product are used as a garnishing ingredient. These were chosen with delicacy to fulfil our motive to produce a whole nutritious product as, flaxseeds are the richest known source of alpha-linolenic acid, the phytoestrogen, lignans, as well as good source of soluble fibre.*

*The investigation was done to optimize the process for developing ragi- wheat cookies with more acceptability by using the okara flour as a partial replacement. From the sensory evaluation, it could be concluded that the cookies presented are great acceptability.*

**Keywords:** Ragi, Okara cookies, Pandan leaves, Fibre, Protein, Jaggery.

**Introduction:**

Cookies are good carrier of nutrients like carbohydrate and fat which can be enriched with protein by partially replacing refined wheat flour with protein rich okara flour up to an acceptable level. Cookies are one of the best known quick snack products. (Liu, K.et.al. (2008).

Ragi is nutritionally superior to wheat and rice, because of its high calcium, dietary fibre and phenolic compounds. The investigation was done to optimize the process for developing ragi- wheat cakes and cookies with more acceptability. It is natural weight loss agent. It prevents skin from ageing. It prevents diabetes. It helps in increases production of mother's milk. (Shotiana.et.al. (2013) .

Okara being a partial substitute of wheat flour with most of its nutritional benefits is chosen for us to have a guilt free, healthier and yummy bite in our cookies. It is high in fibre. It is high in protein content. It is good source of omega-3 fatty acids.(Liu, K (2008).

The uses of harmful synthetic chemical preservatives are still widely found in society. Therefore, it would require efforts to develop safe natural preservatives— for instance, from Pandan leaves (*Pandanus amayllifolius* Roxb) which are often used as a natural food colouring and flavour concentrates, and also are widely known to have anti-bacterial activities. Hence, Pandan is one of the leaves that contain the essence inside and release the key aroma component as their heating with the boiling point of water. Also, as pandan leaves are promising source of natural colorant as well as flavourant, harmful synthetic colourant and flavours are avoided by the use of pandan leave extract and hence were chosen to be one of the main ingredients in our product. (Ningrum, A.et.al.(2015).

Flaxseed (*Linum usitatissimum*) is also known as linseed and these terms are used interchangeably. It is popularly known as Alsí, Jawas, Aksebija in Indian language. The latin name of the flaxseed *Linum usitatissimum*, which means "very useful". It is enriched in alpha-linolic acid (ALA). In





**PEARL MILLET AS A FUNCTIONAL FOOD - A REVIEW**

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**Abstract**

Functional foods can be considered to be those whole, fortified, enriched or enhanced foods that provide health benefits beyond the provision of essential nutrients (e.g., vitamins and minerals), when they are consumed at efficacious levels as part of a varied diet on a regular basis. Linking the consumption of functional foods or food ingredients with health claims should be based on sound scientific evidence, with the "gold standard" being replicated, randomized, placebo-controlled, intervention trials in human subjects. However, not all foods on the market today that are claimed to be functional foods are supported by enough solid data to merit such claims. This review categorizes a variety of functional foods according to the type of evidence supporting their functionality, the strength of that evidence and the recommended intakes. Functional foods represent one of the most intensively investigated and widely promoted areas in the food and nutrition sciences today. However, it must be emphasized that these foods and ingredients are not magic bullets or panaceas for poor health habits. Diet is only one aspect of a comprehensive approach to good health.

**Keywords:** Pearl Millet, Functional Food, Antioxidants, Diabetic Health.

**Introduction:**

Millets are a group of small-seeded grasses that have been cultivated for thousands of years, providing nourishment to people across Africa and Asia. These ancient grains are gluten-free and have low glycemic index, making them a great alternative to rice, wheat, and other cereal grains. Millets are making a comeback in modern times as people become more conscious about their health and environmental impacts.(7)

There are several types of millets, including pearl millet, finger millet, foxtail millet, proso millet, barnyard millet, and kodo millet. Each type of millet has its unique flavor and nutritional value. Finger millet, for instance, is a rich source of calcium and iron, while foxtail millet is high in protein and fiber.(5)

Millets are an ancient group of small-seeded grasses that are gaining popularity in modern times due to their numerous health benefits and sustainability. They are a staple food in many cultures and have been proven to improve overall health and well-being. Incorporating millets into your diet is an easy way to enhance your nutrition and contribute to a more sustainable food system.(5)

Pearl millet is known by different names in different parts of the world, such as bajra in India, bulrush millet in West Africa, and candle millet in the United States. It is a hardy, drought-resistant crop that grows well in arid and semi-arid regions of the world. Pearl millet is a staple food in many parts of Africa and Asia, where it is used to make porridge, bread, and alcoholic beverages. In recent years, pearl millet has gained popularity as a functional food. Millets are mirror cereals of the grass family, poaceae. They are small seeded, annual cereals grasses and are characterized by their ability to survive in less fertile soil. Millets include sorghum (jowar), finger millet (ragi), foxtail millet (kukum), proso millet (chena), little millet (kutki), kodo millet (kodon), barnyard millet (sanwa), and brown top millet.(5)







# A Study of Farmers Awareness Towards Biofertilizers Consumption in Karad District

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## Abstract

This study is focus on farmer's awareness towards Biofertilizers consumption in Karad district & also it will help to create & increase awareness among them & increase agricultural production. Agriculture sector in Karad district is diversified, wide range of crops are grown in the district. This study is concluded that the relevance of Biofertilizers usage particularly for farmers, it is cheap & safe source of inputs of agriculture, protect environment eco-friendly and helpful to increase production as well as decrease in the pollution & soil contamination. This study surely put an important brick in the build of the subject.

## Introduction:

India is an agricultural country. Agriculture is the main occupation of India from thousand of the year. Agriculture is considered to be backbone of India, M.S. Swaminathan opines that without its improvement in agricultural sector, the backbone of the country we will be unable to free our national economy from jeopardy. Around 29 percent of its Gross Domestic Product (GDP) accounts by agricultural sector. Even then considering growing population, it becomes necessary to make improvement in it as 70 percent of the population depends on it. In response to that the efforts had been made out in science and technology and whatever truth came out was being applied to increase the productivity. It includes proper use of fertilizers technology and other inputs.

## Introduction of Biofertilizer:

Biofertilizers are defined as preparations containing living cells or latent cells of efficient strains of microorganisms that help crop plants' uptake of nutrients by their interactions in the rhizosphere when applied through seed or soil. They accelerate certain microbial processes in the soil which augment the extent of availability of nutrients in a form easily assimilated by plants. Very often microorganisms are not as efficient in natural surroundings as one would expect them to be and therefore artificially multiplied cultures of efficient selected microorganisms play a vital role in accelerating the microbial processes in soil. Use of Biofertilizers is one of the important components of integrated nutrient management, as they are cost effective and renewable source of plant nutrients to supplement the chemical fertilizers for sustainable agriculture. Several microorganisms and their association with crop plants are being exploited in the production of Biofertilizers. They can be grouped in different ways based on their nature and function.

Types of Biofertilizers are Rhizobium, Azotobacter, Azospirillum, Cyanobacteria, Azolla, Phosphate solubilising microorganism (PSM, AM fungi, Silicate Solubilising Bacteria (SSB), Plant Growth Promoting.

Advantages of using Biofertilizers are it helps to increase agriculture production with improvement of fertility of soil, it makes reduction in the use of chemical fertilizers, helps in plant growth, it protects the plant against attack by pathogens & also there is no need to take care of plant/crops while using Biofertilizers.

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