



MANDUA – THE HEALTHY SECRET FROM THE HILLS OF UTTRAKHAND, INDIA

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ABSTRACT

Finger millet is one of the cereals grown in Uttarakhand which is known as mandua or koda in local language. It is very much famous for some of the preparations like Mandua ki Roti (ragi Roti) served with Ghee and Gud (Jaggery). It is also eaten with Sarson (Mustard leaves) ki sabzi. Koda ku baadi and Pancake of finger millet flour are some of the local preparations practiced now days in parts of Uttarakhand. It is very rich in dietary fibres. It is known as food of the poor. In the olden days the rich people never used to have this cereal but Due to its high nutrient value its becoming every ones favourite these days. Any cereal crop in the state is cultivated once a year, so it is necessary to grow enough grain so that it lasts for sale through-out the year. Mandua is cultivated in rainy season and has its own technology for the same. After harvesting the plant, the Mandua left is a good animal feed; the value of the dried fodder becomes additional means of income. This is a kind of cereal which has the capability to grow in the waste lands also. In Today's consumer market, it has become expensive than wheat. A multinational company has started making its biscuits as well. Mandua is also being made available online for sale. The popularity of this cereal is increasing day by day. Locals are trying to make it available for maximum people across the world. Government is also supporting by providing grant towards transport subsidy in hilly area, interest subsidy, concession in VAT to name a few. The article talks about the nutrition value of the finger millet, major health benefits. The efforts been made by farmers to promote, restore and export the millet.

KEYWORDS : Finger millet, Uttarakhand, subsidy, vat.

Introduction:

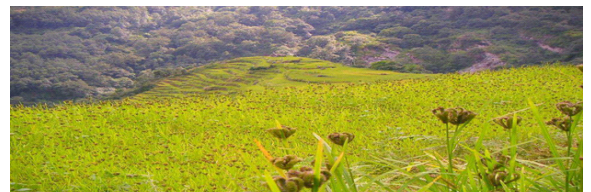
The rice eater is weightless like a bird; the one who eats Jowar is strong like a wolf: one who eats Ragi remains 'nirogi' [illness free] throughout his life - An old Kannada saying (<http://indianresearchjournals.com/pdf/IJMFSMR/2013/April/5.pdf>). FINGER MILLET is widely grown cereal in Africa and Asia. In India it is also known with the name of "Ragi". This is a cereal herb which is cultivated in India from 4000 years. It has a unique ability to withstand cultivation at an altitude of 2000 meters above the sea level. It has a high draught endurance and can be stored for a long time – up to 10 years when it is un-threshed. Some sources report a storage duration up-to 50 years if stored under good storage environment. Its appreciative micronutrient contents - high iron, calcium, magnesium and methionine content. Measured intake of ragi malt increases the protein and mineral uptake significantly.

Major products derived from millets are pasta, noodles, vermicelli and bread. These products are majorly being used by people who are dieting and are health conscious. Ragi has very less fat content and is very useful for fibres and tissue for a human body. The article talks about the nutrition value of the finger millet. The efforts been made by farmers to promote, restore and export the millet.

Mandua in Uttarakhand – In Uttarakhand the cultivation of Finger Millet has been prevalent since ages. With time and increasing awareness of the nutritional value of the finger millet, people of Uttarakhand are making enormous efforts to make sure it reaches to maximum people and consumption of this millet increases by leap and bounds.

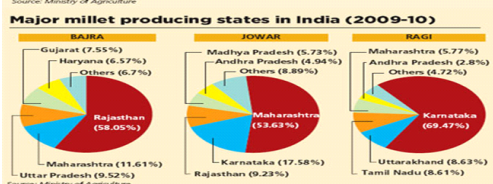
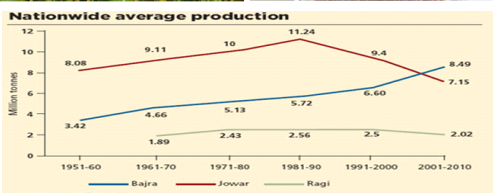
Special care and criteria is being followed in processing the millet. Professors and Scientists from Agricultural universities – GB Pant University of Agricultural and Technology, Pantnagar campus, Uttarakhand University of Horticulture and Forestry, Ranichauri campus, are doing a comprehensive research for the crop improvement, restoring the maximum nutrients while storing the millets for years.

Cultivation of Ragi crop in Uttarakhand –



Horticulture department is supporting the farmers in getting the best fertilizer for the crop. Awareness campaigns are being held by various vendors for the farmers. Samples are also being provided. Government is providing fertilizer and good quality seed at customised rate to encourage cultivation of Finger millets.

With Commercialization and globalizations farmers are also enquiring about the export of millet to increase its market and earn good money. Efforts are being made at local levels to incorporate best promotional activities and increase tie ups so that the millet reaches to maximum people. From villages to nearby towns and



thereafter to big cities is being promoted tremendously.

Process of cultivation:-It is believed that finger millet cultivation happens to be in summers, winters and the rainy season.

The seeds are planted in the month of April and may and when the small sprouts are germinated they are further left to be grown at a height of 1-2 inch. After which the baby millet plants are taken off the ground and are planted back in a different field in the month of June, and the unwanted weeds and plants are taken off (known as guda) the ground in the month of July and August.

In the month of October or November the fruit from the plant is fully ripened and ready to cut down.

The upper part is known as bali and the lower stem is cut down separately.

Then there are two methods to remove the seeds from the pods. The first method is that they directly crush the pods and take out the seeds by crushing them under their feet. The colour of the seeds turns out to be black in this process.

In the second method the pods are collected in the open air, and sprinkled by some water. After a few days the pods are fermented which are left for 2-3 days. In this process the colour of the seed is maroon or golden brown and are considered to be better in quality and in nutrient level. The excrete (lower) part of the plant is sweet in nature and is perfect for the grazing of cows and buffalos. The small children also enjoy chewing the lower part because of its sweet taste.

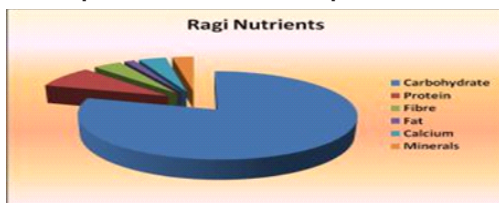
The health benefits of the millet is being recognized and is being promoted by the dieticians and health centres as well.

Nutrition chart of Ragi in comparison with other grains –

Ragi Nutrition Chart (Mineral Comparison)				
Content (mgs)	Brown Rice	Wheat	Maize	Ragi
Calcium	33	30	26	350
Iron	1.8	3.5	2.7	3.9
Niacin	4.3	5.1	3.6	1.1
Thiamin	0.41	0.41	0.38	0.42
Riboflavin	0.04	0.1	0.2	0.19

Ragi Flour Nutritional Value (Chart)		
Content	Amount (Typical)	Amount (Range)
Carbohydrate	72.6	71.3 – 89.5
Protein	7.7	5.8 – 12.8
Fibre	3.6	3.5 – 3.9
Fat	1.3	1.3 – 2.7

Below is the pie chart which shows the split of above numbers.



Contribution by Government –

Government is also promoting the cultivation of Mandua by announcing land development promotional schemes, special state capital production incentives, interest subsidy, power concession to new industrial units, grant towards transport subsidy in hilly area and concession in VAT.

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Major Health benefits being –

1. It controls diabetes –

Due to high dietary fibre and polyphenol content eating finger millet regularly reduces the risk of diabetes. Finger millet has more fibre than wheat, maize and rice. The high fiber content slows down digestion, which keeps blood sugar levels down. It also has low glycemic index, making it ideal for snacking and protecting against blood sugar spikes.

2. Help in Weight Loss

Finger millet plays an important role in weight management. It acts as an important agent in various weight loss programs. Large amounts of fibre and tryptophan reduces hunger pang.

3. Reduce Cholesterol

Finger millet has cholesterol reduction properties, which make it an ideal food for a healthy heart and circulatory system. Finger millet contains three amino acids – lecithin, methionine and threonine which protect against the formation of plaque within blood vessels and deposition of excess fat in the liver, thereby protecting against hypertension, stroke and other circulatory problems.

4. Help Lactation

Besides the direct benefits to the consumer, finger millet benefits a nursing infant through the mother's improved breast milk production. The vitamins, amino acids and minerals present in the grain benefit both the mother and her baby.

5. Aid in Relaxation

Antioxidants in finger millet such as tryptophan help to induce relaxation by eliminating free radicals within the bloodstream. Other finger millet health benefits arising from its antioxidant properties include relief from stress-related problems such as sleep disorders, depression, anxiety, headaches and migraines.

6. Increase Bone Strength

Finger millet is one of the richest plant sources of calcium. It also contains vitamin D. These qualities make it an important agent for development and maintenance of stronger bones. Children and older people should eat more finger millets. Some studies suggest that finger millet can help protect against osteoporosis.

7. Help Digestion

High fiber content in finger millet aids digestion and movement of food through the digestive system. This way, it cleanses the body and protects against constipation and other digestive problems.

8. Treat Anemia

Finger millet sprouts are rich in readily-absorbed iron that helps in blood formation and treatment of anemia. Vitamin C present in the sprouts helps in iron absorption. Regular helpings of meals containing the sprouts will help you access more finger millet health benefits so you can cut down on artificial iron supplements.

9. Have Anti-Microbial Properties

Besides the obvious benefits, finger millet has been found to have antibacterial properties. Tests have shown that it acts against several bacteria – salmonella spp. that causes a fever similar to typhoid, bacillus cereus that is associated with food poisoning, and staphylococcus aureus responsible for many soft tissue and skin diseases including cellulitis, abscesses and furuncles.

10. Have Anti-Cancer Potential

The rich antioxidant profile including flavonoids, tannins and phenolic acids has made finger millet an anti-cancer food. Antioxidants fight inflammation in the body which is believed to be one of the causes of cancer. Studies have found that regular consumers of the grain have a low incidence of esophageal cancer than those on grains such as maize and wheat.

11. Revert Skin Aging

The grain has anti-aging properties. By eating it regularly, you can have a smooth, youthful skin thanks to the amino acids such as lysine and methionine which help in the formation of collagen, thereby slowing appearance of wrinkles.

12. Lower the Risk of Gallstones

Fiber in finger millets helps protect against formation of gallstones by speeding elimination of waste from the digestive system. Studies have shown that regular consumers of foods rich in soluble and insoluble fiber have a 13 percent less risk of getting gallstones than those who don't.

Names in different languages –

Assamese	Maruba dhan
Gujarati	Bavato; nachni; nagali
Hindi	Madua/marua; mandua; maruwa/maduwa; mandwa; ragi
Kannada	Ragi
Kumaon	Kumaon: maddua
Garhwal	Koda; choona
Konkani	Nanchani; Nasne/nachne
Maithili, (Bihar, especially in Mithila region)	Maithili, (Bihar, especially in Mithila region): madua
Malayalam	Ragi;muthary/kuvaraku/kurumbullu/p anjipul
Marathi	Nachani; nagali
Odia	Mandia
Pahari, Himachal Pradesh	Kodra
Punjabi	Mandal/mandhul/mundal
Rajasthani	Nachni; Ragi
Sanskrit	Madhulika; Mattakam; Nriyakundal
Tamil	Aariyam; kezhvaragu; keppai, raagi
Telugu	Ragi; Tamidalu
Urdu	Mandwa; Maruwa, Ragi

- One of the myth or belief in Uttarakhand regarding this cereal that it is never offered to God as bhog. As they believe that mandua is the lower class of cereal.

Result and Conclusion –

Consumption of Finger millet in correct quantity can be an effective diet. It is higher in protein and minerals in comparison to all other cereals and millets. It is a remarkable source of protein, making it perfect for vegetarian diets. It can also be included as a part of staple diet as it lot of essential nutrients, amino acids and minerals. Along with this, the fact that these have reasonable amount of fibre and very low amount of fat content and is making it very popular amongst the dieticians. The nutritional value of the millet is being recognised and being promoted at both national and international level. Proper support and awareness to the farmers will defiantly make it more popular in times to come.

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