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Importance of Minor Millets (Nutri Cereals) In Providing Nutritional Security

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Minor millets (Nutri cereals) are the groups of small seeded cereals belonging to the family *Poaceae*. The most important cultivated species of small millets are pearl millet, finger millet, Foxtail, proso millet, barnyard millet, kodo millet, brown top millet and little millet. Minor millets are also full of micronutrients like Ca, Mg, Mn, fibre, B vitamins, tryptophan, phosphorous. These micronutrients function as antioxidants, which the body needs. Millets can be cultivated with limited resources like less water and less fertilizer application. Improvement of new varieties helps in increase in area of cultivation of millets. During first green revolution huge increase in food grain production through fine cereals was possible to meet food security. Special emphasis should be given to minor millets to provide nutritional security during second green revolution. Low fertile soils and varied climate also suitable for millet cultivation. These crops have a long history of cultivation of more than 5000 years and grown in many States. They have short growing season and can be suited in any type of cropping system. They are having same level of carbohydrate content when compared to cereals and rich in other nutrient elements like fibre, protein, vitamins and minerals. They are rich sources of nutritious grain as well as fodder in a short span of time. Madhya Pradesh has highest area of small millets (32.4%) followed by Chhattisgarh (19.5%), Uttarakhand (8%), Maharashtra (7.8%), Gujarat (5.3%) and Tamil Nadu (3.9%). Uttrakhand has highest productivity of 1174 Kg/ha followed by Tamil Nadu (1067 Kg/ha) and Gujarat (1056 Kg/ha). The area used to grow these small millets and their yield have dramatically declined during the last three decades. Hence there is an urgent need to identify potential germplasm which are sources for valuable genes like abiotic and biotic resistance and breeding programme should be taken up to develop high yielding varieties. Value addition through primary processing and secondary processing helpful in enhancement of area under millets cultivation.

Minor millet consumption and its Nutraceutical facts

The food habits have been changed from old generation to new generation. The presently rice consuming habit leads to diabetes due to fast digestion. Minor millets are having low glycemic index hence they will digest very slowly and they will reduce diabetes and obesity problems. Malnutrition is one of the major problem in India and our country spent huge amount of money for health issues which will effect our GDP. Minor millets provide higher fibre, so that regular consumption of millets solve the problem of overweight.

Pearl millet contains high amount of Iron and Zinc compared to cereals which will reduce the anaemia problems in women and children. There is a cope of improvement of these nutrients through development of biofortified varieties and hybrids. Finger millet contains high levels of calcium that helps in strenghthening of bones. Foxtail millet contains high fibre and low glycemic index which address the diabetic patients. Other minor millets are richest sources of essential minerals like phosphorous and magnesium. Regular consumption of these crops results in heart attack diseases. Helpful in metabolism though development of tissues and organs (Table 1).

Nutrition value of millets will be further enhanced by value added products like ragi malt. Post harvesting losses are very less in case of millets compared to cereals due to presence of many layers around the seed coat. All the nutrients are concentrated through out the small grain, where as they are limited to outer most layers in case of cereals. Hence there is a loss of fibre and protein during milling process. They will maintain the balance of Ph of human body due to several important enzymes.

Millets are gluten free and suitable for diabetic people who are unable to consume wheat. They are also rich in pytates, phenolic acids and tannins which prevents cancer and cardiovascular diseases.

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Table 1: Nutrient composition of millets compared to fine cereals (per 100 g) **Food gain**

Food gain	**Carbo-hy-(drates (g**	**P r o -(tein (g**	**(Fat (g**	**Energy ((K.Cal**	**C r u d e fi b r e ((g**	**M i n e r a l m a t t e r ((g**	**C a ((mg**	**(P (mg**	**F e ((mg**
Minor millets									
Finger millet	72.0	7.3	1.3	328	3.6	2.7	344	283	3.9
Kodo millet	65.9	8.3	1.4	309	9.0	2.6	27	188	0.5
Proso millet	70.4	12.5	1.1	341	2.2	1.9	14	206	0.8
Foxtail millet	60.9	12.3	4.3	331	8.0	3.3	31	290	2.8
Little millet	67.0	7.7	4.7	341	7.6	1.5	17	220	9.3
Barnyard millet	65.5	6.2	2.2	307	9.8	4.4	20	280	5.0
Major Millets									
Sorghum	72.6	10.4	1.9	349	1.6	1.6	25	222	4.1
Bajra	67.5	11.6	5.0	361	1.2	2.3	42	296	8.0
Cereals									
(Wheat (whole	71.2	11.8	1.5	346	1.2	1.5	41	306	5.3
Rice (raw, (milled	78.2	6.8	0.5	345	0.2	0.6	10	160	0.7