



## **Standardization of Various Cereal's and Pulses for Development of Nutrient Rich Bhakarwadi.**

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### **ABSTRACT**

*With fastly growing world every sector is developing same pace. Everyone of this era cannot get plate of food in traditional way. So this is time to make food very nutritious, tasty and very handy. This 'nutritional rich bhakarwadi is to serve need. This is made by using typical method but ingredient make difference that is protein richness of soybean, moong dal, goodness of red lentils, split black lentils etc. Practices of handling the food and appropriate packaging and labelling are also there. One of the important methods used here is 'roasting' which is needed in case of soybean- to inhibit trypsin. To meet consumers, need of taste and nutrition. This product will content the food product manufacturing competition. nutrient rich bhakarwadi contains 10% oats flour, 5% soybean flour, 5% chickpeas lentils flour, 5% red lentils flour, 5% moong dal flour, 5% sorghum flour, 10% wheat flour, 5% rice flour and 5% split black lentils flour and 45% other masala Ingredients as project includes from making to sensory evaluation and nutritional evaluation of the product.*

**Key words** - cereal's, pulses, nutrient rich, bhakarwadi, protein rich.

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### **INTRODUCTION:**

India is the largest producers of Cereals and pulses are rich Source of protein Indian people take meal as a combination of cereals and pulses so its balances the diet with Combination of Carbohydrates and protein. Nutritional rich bhakarwadi is an innovative snack product which is prepared from various cereals pulses flour. The product which will be suitable for health-conscious people. "NUTRIENT RICH BHAKARWADI" is developed as a snack for a health-conscious people. It is based on a traditional spicy Gujarati snack recipe "Bhakarwadi" which can be stored for week. The flour based round discs are stuffed with roasted poppy seed, grated coconut and spices (1). The traditional recipe is modified in aspects to lower fat, and improve its fiber, protein, antioxidant and mineral content with the use of various cereals and pulses flours such as oats, soybean, wheat, sorghum, rice, red lentils, moong dal, split black lentils, chickpeas Lentils etc. It contains good amount of fibre and low calorie, such as fennel seeds, poppy seeds, cumin seeds, coriander seeds, were also used in this recipe (2).

Oats are excellent source of soluble fiber, pertained in the B vitamins, thiamin, riboflavin and B6. They additionally give iron, calcium, magnesium, selenium and phosphorus (5). Soybean is rich in Lecithins on level 3% that is beneficial for brain development. It is also rich in Ca, P, and vitamins A, B, C and D. Soybean flour has a low carbohydrate content and high in protein, compared to other flour (6). Chickpea is plentiful in fiber, minerals (phosphorus, calcium, magnesium, iron and zinc) and fi-carotene. Its lipid part is high in' unsaturated fats (16). Wheat flour is a fundamental fixing in bread, cakes, treats, and most heated products (9). Sorghum & millets are excellent source of carbohydrate micronutrients & phytochemicals with nutraceuticals properties. They contain 7-10% protein, 2-5% fat 65-70% available carbohydrate 15-20% dietary fibre. Niacin & pyridoxine contents in pearl millet are higher than all other cereals (19). Rice is a cereal grain and the most widely consumed staple food for a large part of the world's human population, especially in Asia. Rice provides 21% energy and 15% of per capita protein of global human (10). Moong beans are a high source of nutrients including: manganese, potassium, magnesium, folate, copper, zinc and various B vitamins (8). Red Lentil Flour is an extremely good supply of folate and magnesium, which can be huge participants to coronary heart health (7). Black gram or urd dal holds an excessive protein price than maximum of the legumes. It is likewise a superb supply of nutritional fiber, isoflavones, diet B complex, iron, copper, calcium, magnesium, zinc, potassium, phosphorus (15).

## MATERIAL AND METHODS

The experiment was carried out at laboratory of department of food processing and packaging. Yashwantrao chavan institute of science, Satara. During the year 2022-2023. The experiment was conducted with two treatments. Product was prepared and analyzed for different Physical and sensory attributes.

### Collection of raw materials and Equipment's

All the material required for the experiment were purchased from the local market of Satara cereal's, pulses and other required spices .The microwave oven available in Department of Food Processing and Packaging Yashwantrao Chavan Institute of Science Satara, were used for baking of nutrient rich bhakarwadi. Hot air oven, FIBRAPLUS FES 06 E, SOCSPLUS SCS 06 E, KELPLUS CLASSIC-DX, Muffle furnace were used for determining of moisture, fiber, fat, protein, Ash respectively.

### Materials:

Oats flour, soyabean flour, chickpeas lentils flour, Red lentils flour, split black lentils flour, moong dal flour, sorghum flour, wheat flour, rice flour, roasted grated coconut, roasted fennel seed, roasted coriander seeds, roasted coriander seeds, roasted sesame seeds, poppy seeds, chilli powder, garam masala, dried mango powder, salt, chilli powder, tamarind jaggery pulp etc.

### Methods:

**Roasting:** The cereal's and pulses were roasted in an open pan for 5 min at 100°C. After that seeds were cooled to room temperature. And then make flour.

**Kneading dough:** The flours are transferred to a bowl. To which spices, salt and heated oil were added. These ingredients were kneaded together with the help of water to form dough.

**Preparation of stuffing:** The whole ingredients roasted like grated coconut, corinder seeds, fennel seeds, cumin seed, poppy seeds and sesame seeds. Then all roasted ingredients and other ingredients like salt, chilli powder, garam masala, dry mango powder, sugar and grind.

### Composition of nutrient rich bhakarwadi

**Table 1: composition of nutrient rich bhakarwadi**

Sr. No.	Ingredients	Quantity in (%)	Quantity in (%)	Quantity in (%)
1.	Oats	10	10	10
2.	Wheat	5	5	10
3.	Soyabean	5	5	5
4.	Chickpea Lentils	5	10	5
5.	Red lentils	5	5	5
6.	Moong dal	5	5	5
7.	Split black lentils	5	5	5
8.	Sorghum	5	5	5
9.	Rice	10	5	5
10.	Stuffing ingredients	45	45	45

### Standard preparation of nutrient rich bhakarwadi:

All the different flours were weighed and transfer in a bowl, to this salt and heated oil were mixed. This mixture was kneaded with water to form dough.

All the whole spices and grated coconut were roasted and transfer to a mixture jar. To it coriander seeds, fennel seed, cumin seed, poppy seeds, sesame seed, dried mango powder, chilli powder, garam masala, salt, sugar added and grind.

The dough balls were made and rolled into circle sheets using the rolling pin. On these sheets, tamarind-jaggery pulp was spread evenly and the spice mixture i.e stuffing was spread throughout the sheet.

Another dough ball was roll it and pressed from the outer surface so that the stuffing did not come out.

The Bhakarwadi were cut into uniform pieces using a knife and arranged in the baking tray.

The Bhakarwadi were baked at 180°C for 20 minutes and packed in PET package.

**Fig. 1: Preparation flow chart of bhakarwadi**

### Proximate evaluation:

The proximate analysis of various baked Bhakarwadi was carried out to ascertain the level of various biochemical constituents.

**Estimation of moisture content:** Moisture content of the product was estimated by using Oven Drying Method i.e. the conventional method. The crushed Bhakarwadi sample was weighed and treated under 100°C for 3 hr. in the Hot Air Oven (20).

**Estimation of ash content:**

Ash content of the crushed Bhakarwadi sample was estimated using Muffle Furnace. The sample was weighed and incinerated to remove carbon molecules from the sample and ignited at 550°C in the Muffle Furnace for 5 hours (20).

**Estimation of protein content:**

The protein content of the product was assessed by utilizing Kjeldahl method. The Nitrogen Content of the sample was determined by Digesting, Distillation and Titration against the working standard and the amount was multiplied by a factor of 6.25. Methods described in A.O.A.C (20).

**Estimation of fat content:**

Fat analysis of the product was assessed by utilizing the Soxhlet method. Method described in A.O.A.C Manual (20).

**Estimation of crude fiber:**

Crude Fiber was evaluated by Acid-Alkali Hydrolysis method described in A.O.A.C (20).

**Sensory evaluation of the product:**

The sensory assessment of the product was done by involving a 09-point hedonic scale for different tactile boundaries like appearance, smell, variety, taste and its general worthiness (21).

**RESULT AND DISCUSSION:**

**Sensory evaluation of prepared product**

The data regarding the sensory evaluation of Nutritional rich bhakarwadi is presented in Table 2. As per 9 point hedonic test, with respect to colour, flavour, texture, aroma, and overall acceptability sensory score for sample 3 was significant. Sample 3 has been selected and moving forward for further study.

**Table 2: Sensory evaluation of nutrient rich bhakarwadi**

Parameters	Sample 1	Sample 2	Sample 3
Colour	7.21	7.38	8.44
Texture	6.88	6.97	8.36
Aroma	6.91	8.44	7.89
Taste	7.54	8.22	8.66
Flavour	7.23	7.44	7.81
Overall acceptability	7.15	7.69	8.23

**Proximate analysis of prepared product**

According to A. O. A. C. methods the appropriate composition of nutritional rich bhakarwadi including moisture, fat, protein, fiber and carbohydrates was determined. Nutrient rich bhakarwadi (Sample 3) having significant amount of carbohydrates 56.18% , Fat 15.17% , Protein 14.10% as shown in the table 3 , because of nutritional composition of the raw ingredients like cereals and pulses.

**Table 3: chemical composition of nutrient rich bhakarwadi**

Parameters	Quantity as per 100g
Carbohydrates (%)	56.18
Fat (%)	15.27
Protein (%)	14.10
Moisture (%)	7.14
Ash (%)	5.08
Crude fiber (%)	2.23

**CONCLUSION**

On the account of above observations, the nutrient rich bhakarwadi is protein and fat rich as the protein content was found to be 14.10 in 100 gm. It is enriched with functional foods such as soybean, Oats flour, soybean flour, chickpeas lentils flour, Red lentils flour, split black lentils flour, moong dal flour, sorghum flour, wheat flour, rice flour which has additional health benefits .Nutrient rich bhakarwadi is baked and not deep fried which reduce the oil content of recipe and make it low fat snack.

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