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## Value addition of traditional recipes of Chhattisgarh: The rice bowl of India

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### Abstract

The inhabitants of Chhattisgarh the "Rice Bowl" of India, eat Rice in all the meals as a staple cereal and they also use Rice as a main ingredient in all their other food preparations. Rice is a good source of Carbohydrate and hence is quite energy dense but is deficient in a number of essential amino acids. So this study was undertaken and 18 traditional recipes popularly consumed in Urban, Rural and Tribal Chhattisgarh were value added by functional ingredients like soy flour, soy milk & soy curd. It was observed that the energy value of such recipes rose in a range of 6.23% to 23.52% while the protein content dramatically shot up in a range of 19.66% to 457.64%. This study supports the view that to combat malnutrition and to prepare low cost balanced foods, value addition can play a major role.

**Keywords:** Rice based traditional recipes, Soy products, Value addition, Nutritive value, Protein quality.

### 1. Introduction

Traditional Recipes are those which are specific of the region and are prepared and eaten since time immemorial. Chhattisgarh is also considered as the "Bowl of Rice" and therefore majority of the traditional food items are made out of rice. Rice is the staple crop here as well as the chief food item of a common Chhattisgarhi person. A regular Chhattisgarhi meal comprises rice, pulses, and a green leafy vegetable. Green fresh chutney of tomatoes, green chillies and coriander leaves is a much relished item of Chhattisgarhi meal. The Chhattisgarhi meal is high in carbohydrates and some micronutrients but the quality of Protein is not very good.

Though rice can meet out the daily calorie requirement of a person very well, as it is rich in carbohydrates, but is deficient in a number of essential amino acids and micronutrients. So all the recipes made out of rice are generally deficient in the above nutrients. In order to prepare balanced recipes out of Rice, it is necessary to add certain ingredients for value addition. Any product can be considered value-added if it is originally grown by the farmer and increased in value "by labour and creativity". New Rice which is harvested in the month of November is used for the preparation of number of traditional recipes in Chhattisgarh. Cheela, Farah, Muthia, Puran Laddu, Thetri, Murukku, Pedia, Aairsa, Khaja, Biria, Gulgula, Chousela, Dehroni, Lapsi and Babra are mouth-watering traditional delicacies of Chhattisgarh. With greater nutritional awareness, it seems relevant that measures should be taken to improve the nutritive value of these recipes by value addition with some functional foods. Moreover the special characteristics of the recipes should remain unchanged.

Blah & Joshi (2013) <sup>[1]</sup> performed a study on various traditional foods consumed by ethnic Khasi tribe of Meghalaya, India. A total of 80 dissimilar most preferred recipes of vegetarian and non-vegetarian were selected and standardized. A panel of 10 women assessed the recipes for sensory acceptance. The nutritive value of the standardized recipes were calculated for one portion size meal for all the major & micronutrients such as energy, protein, fat, carbohydrate, fibre, calcium, iron, vitamin C and carotene.

Dorner (2009) <sup>[2]</sup> has suggested that those people who are unable to get enough nutrition from their diets and those people who have poor diet can take value added products in the form of calorie and protein boosters.

Kumar & Thakur (2014) <sup>[4]</sup> conducted a study on sensory and physico-chemical analysis of banana based pre biotic soy yoghurt. Soy yoghurt was made with varying levels 0, 5, 10 and 15% of banana puree. The samples were analyzed for chemical attributes of fat, pH, lactic acid and total solids percent. Sensory attributes such as color, texture, flavour and overall

acceptability was used for yoghurt evaluation. The result revealed that consumers preferred 10% and 15% banana based soy yoghurt over the 5% and 0% banana puree soy yoghurt. So, in order to assess the nutritive value of traditional recipes of Chhattisgarh this study was planned. The selected recipes were assessed nutritionally for their protein and energy content. Value addition of the Recipes was done using Soya products. Again the Nutritive value of the enriched recipes was calculated using food composition tables of ICMR.

**2. Methodology**

Traditional recipe samples, mostly rice based, were selected from different areas of Chhattisgarh state namely urban, rural and tribal. The selected recipes were prepared in laboratory using standard techniques. Calculation of the nutritive value was carried out using Food Composition Tables of NIN Hyderabad [3]. Value addition of the traditional recipes was done to improve its nutritive value, its appearance, & its flavor. Calculation of the Nutritive value of the Value added recipes was done. For value addition Soy flour, Soy milk, & Soy curd was used. The value added recipes were evaluated by a group of six semi trained Judges for their taste, appearance, flavour and acceptability.

**3. Results & Discussion**

After the data collection, it turns to the task of processing and analyzing them according to the outline laid down for the purpose at the time of developing study. The results of the study are systematically discussed under the following heads in order to draw conclusions from them.

- Selection of Recipe
- Standardization & preparation of Recipe
- Value addition in different proportions
- Sensory evaluation

The results of the study have been presented in Table No.1 to Table No.5

The recipes selected for value addition were some of the most popular recipes used in the urban, rural and tribal Chhattisgarh. A total of 18 recipes were selected, out of which eight were Rice based recipes mostly used as snacks and during festive occasions while 10 were non rice recipes which were made out of other ingredients than Rice. Out of these ten Recipes, seven were snacks and three were recipes used along with the main course in lunch and dinner. Similarly, out of the 18 selected Recipes, all the 18 recipes were popularly used in urban Chhattisgarh, 14 in rural Chhattisgarh while only seven recipes were popularly used in Tribal Chhattisgarh. The distribution of the Recipes is depicted in Table No.1 and 2.

**Table 1:** Distribution of the Selected Recipes on the basis of their Usage in population.

S. No.	Name of Recipe	Urban	Rural	Tribal
1	Aairsa	√	√	----
2	Bobra	√	√	----
3	Chaur pedia	√	----	----
4	Chousela	√	√	----
5	Dehrauri	√	----	----
6	Dudh Farah	√	√	√
7	Foranhaa Cheela	√	√	----
8	Paan Roti	√	√	√
9	Khaja	√	√	----
10	Gulgula	√	√	√
11	Kusli	√	----	----
12	Kari laddu	√	√	√
13	Papchi	√	√	√
14	Thethari	√	----	----
15	Khurmi	√	√	√
16	Masoor Batkar	√	√	----
17	Dubki Kadhi	√	√	√
18	Bafari Kadhi	√	√	----

**Table 2:** Distribution of the Selected Recipes on the basis of their Ingredients.

S. No.	Categories	Name of recipes
1.	Rice based	Aairsa, Bobra, Chaur pedia, Chousela, Dehrauri, Dudh farah, Foranhaa cheela, Paan roti
2.	Other than Rice	Khaja, Gulgula, Kusli, Kari laddu, Papchi, Thethari, Kurmi, Masoor batkar, Dubki kadhi, Bafari kadhi

The Rice based recipes were prepared using the original Standard recipe and their Calorie and Protein content was calculated. It was found that “Aairsa”, the sweet, semi hard fried discs made out of rice flour, jaggery and gingelly seeds contains 513 Kcal energy and 4.8 g Proteins but after value addition with Soy flour the energy content rose to 545 Kcal and Protein to 9.52g. The gain in energy content was 6.23% but a dramatic change of 98.33% was observed in the Protein content. Similar changes were observed with “Bobra” the brown, hard, fried, sweet balls Made out of rice flour & jaggery. Its Calorie content was 335 Kcal and Protein content Was 2.72g. After value Addition with soy flour & soy milk the

Calorie content was 395 Kcal with a rise of 17.91% and the Protein content was 10.5g with a rise of 286.05%. “Chaur pedia” the sweet, hard, coconut coated elliptical balls made out of rice flour, sugar, ghee & coconut contains 602 Kcal energy and 5.1 g Proteins which on value addition with Soy curd and Soy flour became 652 Kcal and 12.2 g respectively. “Chousela” is the salty poorie made out of rice flour. Its energy content was 255 Kcal and protein content was 1.7g. After value addition with soy milk & soy flour the energy content rose to 315 Kcal while a dramatic change was seen in the Protein content which became 9.48g and the percentage rise was 457.64% (Table No. 3).

**Table 3:** Nutritional Content of the Selected Rice based Recipes before and after Value addition and Percentage change observed

Nutritional Content	Before Value Addition	After Value Addition	Percentage Change
Aairsa			
Energy (Kcal)	513	545	+6.23%
Protein ( G )	4.8	9.52	+98.33%
Bobra			
Energy (Kcal)	335	395	+17.91%
Protein (G)	2.72	10.5	+286.02%
Chaur Pedia			
Energy (Kcal)	602	652	+8.30%
Protein (G)	5.1	12.2	+139.21%

Chousela			
Energy (Kcal)	255	315	+23.52%
Protein (G)	1.7	9.48	+457.64%
Dehrauri			
Energy (Kcal)	660	720	+9.09%
Protein (G)	3.75	11.53	+207.46%
Dudh Farah			
Energy (Kcal)	155	188	+21.29%
Protein (G)	4	11	+175.00%
Foranhaa Cheela			
Energy (Kcal)	320	363	+13.43%
Protein (G)	4.34	9.3	+114.28%
Paan Roti			
Energy (Kcal)	205	248	+20.97%
Protein (G)	2.26	7.66	+238.93%

Table No. 3 depicts that “Dehrauri” which is energy dense fried soft ball made out of Rice, ghee, curd & jaggery and coated with jaggery syrup, contains 660 Kcal energy and 3.75 g Proteins. After value addition with Soy flour & soy curd the Calories rose to 720 Kcal and protein became 11.53g. “Dudh Farah” is a popular recipe of natives of Chhattisgarh which is a sweet boiled rice product cooked in milk. Its nutritive value in terms of calories and protein was 155 Kcal and 4.0g respectively. After value addition with soy flour & soy milk the calorie content became 188 Kcal and Proteins-11g. The percentage change was observed to be 21.29% for calories and 175% for proteins. “Foranhaa Cheela” is salted rice pancake

with added seasoning.

Its Calorie content was found to be 320 Kcal and Protein content 4.34g which on value addition with soyflour and Soy milk rose to 363Kcal and 9.3g. The percentage change was observed to be 13.43% for calories and 114.28% for proteins. “Paan Roti” is thick chapati made out of rice flour, salt & oil, cooked between castor leaves on cowdung cake. Its Calorie content was 205 Kcal and Protein content was 2.26g which on value addition with soy flour & soymilk became 248 Kcal and 7.66 g respectively. The percentage change was 20.97 for calories and 238.93 for proteins.

**Table 4:** Nutritional Content of the Selected Non- Rice Snacks Before and after Value addition and Percentage change observed

Nutritional Content	Before Value Addition	After Value Addition	Percentage Change
Khaja			
Energy (Kcal)	500	545	+9.00%
Protein (G)	5.5	10.5	+90.90%
Gulgula			
Energy (Kcal)	324	367	+13.27%
Protein (G)	6.3	11.7	+85.71%
Kusli			
Energy (Kcal)	360	403	+11.94%
Protein (G)	7.97	13.37	+67.75%
Kari Laddu			
Energy (Kcal)	262	305	+16.41%
Protein (G)	7	12.4	+77.14%
Papchi			
Energy (Kcal)	450	493	+9.55%
Protein (G)	6.1	11.5	+88.52%
Thethari			
Energy (Kcal)	298	341	+14.42%
Protein (G)	10.4	15.8	+51.92%
Khurmi			
Energy (Kcal)	350	393	+12.28%
Protein (G)	4.7	10.1	+114.89%

Certain Non- Rice recipes are also popular in Chhattisgarh which are generally made out of Wheat flour, Gram flour (Besan) adding certain other ingredients. Table No. 4 depicts that “Khaja” which is a sweet, fried snack made out of maida, sugar & oil, contains 500 Kcal energy and 5.5 g Proteins. After value addition with Soy flour & soy milk the Calories rose to 545 Kcal and protein to 10.5 g. The percentage change was observed to be 9% for calories and 90.9% for proteins. Similar changes were observed with “Gulgula” the brown, fried, sweet balls made out of wheat flour, jaggery, coconut & oil. Its Calorie content was 324 Kcal and Protein content was 6.3g. After value addition with soy flour & soy milk the calorie content was 367 Kcal with a rise of 13.27% and the Protein content was 11.7g with a rise of 85.71%. “Kusli”, a sweet,

fried snack made out of maida, khoa, coconut, dry fruits and sugar contains 360 Kcal energy and 7.97 g Proteins but after value addition with Soy flour & soy milk the energy content rose to 403Kcal and Protein to 13.37g. The gain in energy content was 11.94% but a dramatic change of 67.75% was observed in the Protein content.

“Kari laddu” are laddus made out of Besan sev & jaggery syrup and contain 262 Kcal energy and 7g Proteins which on value addition with Soy flour and Soy milk became 305 Kcal and 12.4 g, respectively. The percentage change was 16.41 for calories and 77.14 for proteins. “Papchi” which is sugar syrup coated, fried disc made with wheat flour & shortening, contains 450 Kcal energy and 6.1 g Proteins. After value addition with Soy flour & soy milk the Calories rose to 493

Kcal and protein became 11.5g. The percentage change was 9.55 for calories and 88.52 for proteins. "Thethari" is fried salted snack made out of Besan & shortening. Its energy content was 298 Kcal and protein content was 10.4g. After value addition with soy milk & soy flour the energy content rose to 341 Kcal while a dramatic change was seen in the Protein content which became 15.8g and the percentage rise was 51.92%. "Khurmi" is the fried, sweet snack made out of wheat flour, jaggery & oil. Its Calorie content was 350 Kcal and Protein content was 4.7g. After value addition with soy flour & soy milk the calorie content was 393 Kcal with a rise of 12.28% and the Protein content was 10.1g with a rise of 114.89%.

**Table 5:** Nutritional Content of the Selected Non-Rice Recipes used in major meals before and After Value addition and Percentage change observed

Nutritional Content	Before Value Addition	After Value Addition	Percentage Change
Masoor Batkar			
Energy (Kcal)	213	240	+12.67%
Protein (G)	11.95	14.3	+19.66%
Dubki Kadhi			
Energy (Kcal)	232	285	+22.84%
Protein (G)	10.4	16.48	+58.46%
Bafari Kadhi			
Energy (kcal)	216	275	+27.31%
Protein (g)	9.34	17.12	+83.29%

In Chhattisgarh some food items are eaten with Rice in main course. Table No. 5 depicts that "Masoor Batkar" which is salted, spicy lentil cooked dry with curd and gram flour contains 213 Kcal Energy while its Protein content was 11.95g. On value addition with soy flour & soy curd the energy content became 240 Kcal and Protein content 14.30 g. The percentage change was 12.67 for calories and 19.66 for proteins. "Dubki Kadhi" is made out of seasoning of buttermilk with added urad dal balls. Its nutritive value in terms of calories and proteins was 232 Kcal and 10.4g respectively. After value addition with soy flour & soy curd the calorie content became 285Kcal and Proteins16.4g. The percentage change was observed to be 22.84 for calories and 58.46 for Proteins. "Bafari Kadhi" which is a preparation of chana dal spicy balls, steamed and fried and put in kadhi in place of bhajjiya. Its nutritive value in terms of calories and proteins was 216 Kcal and 9.34g respectively. After value addition with soy flour & soy curd the calorie content became 275Kcal and Proteins 17.12g. The percentage change was observed to be 27.31% for calories and 83.29% for proteins.

#### 4. Conclusion & Recommendations

The study concludes that if traditional food items which are generally made out of single cereal, are value added with some nutritious food item, it can show a dramatic rise in their nutritive value. Especially there is a quantitative as well as qualitative enhancement in Protein content. Micronutrients will also show a positive improvement, though they are not calculated in this study. The new products developed after value addition need to be evaluated organoleptically by consumer panels. The new value added recipes should be popularized among the community through awareness camps and exhibitions. The proposed study is an approach for developing a model that may serve to combat malnutrition in Chhattisgarh state by preparing nutritionally adequate recipes from traditional recipes and further promoting these recipes

among the population, especially the women who are responsible for food preparation at home.

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