

## Nutrient Composition of Traditional Festival Foods of North Karnataka

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**ABSTRACT** India has a rich treasure of traditional foods specific for festivals. An investigation was undertaken to document the different traditional foods prepared during Hindu festivals of North Karnataka and to assess nutritive value of such foods. Data were collected through a cross sectional survey of 200 Hindu families (100 each from rural and urban areas) of Dharwad Taluka. The study revealed that 78 traditional foods (45 sweet and 33 savory) were prepared which were characteristic to this region during the different major festivals. Typical to this region were the use of ingredients like wheat gluten, gum crystals, traditional pasta products, minor oilseeds such as linseed and niger, recrystallized special sugar, safflower milk and seeds of marking nut tree. A majority of festival foods were based on cereals in both sweet and savory categories. Boiling, roasting, pan baking or pounding were the common processing methods followed and deep frying was not a common method. It was observed that, the calorific value of the sweet items ranged from 115 to 283 K cal per serving. Bajra *roti* was found to be highly nutritious, providing higher levels of energy, protein, calcium, iron, magnesium, copper and zinc than rest of the savory festival foods. Foods low in fat, calories, carbohydrates and sodium were identified.

### INTRODUCTION

Traditional foods are the foods based on sound foundation of culture, custom, natural environment and consumed by people over long time. Traditional foods are developed through ages invented, modified, utilized and evolved to overcome the monotony in the diet. The traditional foods are carefully held and not quickly changed. The study and understanding of traditional foods is important because it provides knowledge of foods, useful for people engaged in community nutrition programs, because such foods are easily accepted in the communities. The information would also help in the development of new food products for modern markets. Further, the significance of such traditional foods is more appreciable when their nutritive value is known. In this regard, India has a rich treasure of traditional foods specifically prepared for festivals, rituals, and physiological conditions. Karnataka is a land of rich cultural heritage with diverse festivities and foods. Limited review is available on traditional foods of Karnataka. Azer (1977) and Anonymous (1988) reported the festivals and foods of southern Karnataka. However, there is no information on the festivals and traditional

foods of North Karnataka in particular, which has different agro-climatic conditions and food habits. Hence, an investigation was undertaken to document the different festival foods and to compute the nutritive value of such foods.

### MATERIAL AND METHODS

A cross sectional survey of 200 Hindu families (100 each from rural and urban areas) of Dharwad Taluka, was carried out for data collection. The urban respondents were selected randomly from city central point and from the four directions of the central point. Similarly, villages situated in four directions from Dharwad city were chosen for data collection. Care was taken to choose only those villages, which had no urban influence.

A pre-tested questionnaire was used to elicit the information regarding the family, socio-economic status, the festivals celebrated and the traditional foods prepared during these festivals, from knowledgeable women who were in charge of the family food system. Besides, a longitudinal survey was undertaken over one calendar year to know the preparation protocols for various festival foods of the region. The quantity of each ingredient used in the preparation of festive food was determined using standard measuring cups and teaspoons. Further nutrient composition of these foods was computed using Annapurna Soft-ware version 3, developed by Chandrashekhar (1998).

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## RESULTS AND DISCUSSIONS

**Festival Foods and Raw Materials:** The survey of urban and rural families revealed that 78 festival foods (45 sweet and 33 savory) were prepared during the different festivals. Among these, there were many traditional foods, which were characteristic to this region (Table 1). Wheat, foxtail millet, rice and bengal gram were commonly used in traditional food preparations. Characteristic to this region were the use of ingredients like gluten (extracted from wheat), crystals of gum (derived from trunks of *Acacia nilotica* tree) and conventional condiments such seeds of marking nut tree (*Artocarpus anacardium*). Ghee or oil was used in the cooking to a minimum extent.

Traditional pasta products such as *Savate beeja* (seeds of cucumber, prepared with home made refined wheat flour) were used for *paysam* preparation. There were several traditional pasta products varying in size and shape, which were made during summer, dried and stored for use, through out the year. The pancakes and *laddu* of oilseeds such as groundnut and gingelly were usually prepared in winter festivals as energy dense foods. Milk extracted from safflower seeds was used in preparation of rice based savory product called *Akki huggi*. Among the savory foods, also there were specific foods of this region. Puffed sorghum (prepared with specific variety of popping sorghum), steamed dumpling *Undigadabu* and steamed puri *Bichagadabu*

**Table 1: Typical regional festival foods of North Karnataka**

Name	Main ingredient and preprocess	Other ingredients and final process
<b>Sweet Foods</b>		
<i>Allittu</i>	Wheat, rice and roasted and milled	Laddu prepared with jaggery. Cardamom is the condiments
<i>Tambittu</i>	Foxtail millet roasted and milled	Laddu prepared with jaggery. Cardamom is the condiments
<i>Gulladki laddu</i>	Wheat Gluten washed well to remove starch, pounded with wooden pestle. Sorghum grain sized balls made manually and fried in oil/ghee	Laddu prepared with the fried balls using jaggery. Poppy seeds and nutmeg are the condiments
<i>Gudagana huggi</i>	Thick vermicelli made from whole wheat flour are directly dropped in simmering boiling water	Sweetened with jaggery; poppy seeds and cardamom are the condiments
<i>Godhi huggi</i>	Pearled wheat	Boiled until very soft, sweetened with jaggery. Poppy seeds and nutmeg are the condiments
<i>Akki huggi</i>	Rice cooked in safflower milk	Both sweet and bland; payasam like product
<i>Madeli</i>	Powder prepared from thick chapati of whole wheat flour and semolina	Sweetened with jaggery; copra, poppy seeds and cardamom are condiments
<i>Savate beejada payasa</i>	Home made pasta products resembling cucumber seeds	Simmered to make <i>payasam</i> like product
<i>Hurakki holige stuffing</i>	Foxtail millet flour, kneaded with hot jaggery syrup as stuffing	Stuffed, deep fried pan cake
<i>Karadantu</i>	Puffed Bengal gram dhal flour, jaggery, crystals of edible gum, seeds of marking nut tree	Burfi prepared
<i>Groundnut /til pancakes</i>	Oilseeds, roasted and powdered along with jaggery to make a stuffing	Stuffed and rolled in to pancakes, baked on tawa without oil
<i>Pumpkin gargi</i>	Red pumpkin gratings, whole wheat flour and jaggery	Deep fried
<i>Sweet potato holige</i>	cooked sweet potato ground with jaggery used as a stuffing	Rolled in to stuffed pancakes.
<b>Savory Foods</b>		
<i>Bajra roti</i>	Thin <i>papad</i> like roti patted with gingelly seeds	Pan baked
<i>Bichagadabu</i>	Whole wheat flour <i>puri</i>	Steamed
<i>Undigadabu</i>	Jowar flour steamed and small dumplings made	Dumplings steamed
<i>Puffed sorghum</i>	Special variety of Sorghum	Puffed(popped)
<i>Linseed chutney powder</i>	Roasted	Ground with spices
<i>Niger chutney powder</i>	Roasted	Ground with spices
<i>Kuchchidakhara</i>	Chillies blanched	Ground with spices
<i>Mesta bhaji</i>	Mesta leaves, cereal grits, pulses and peanuts	Simmered and mashed.

(prepared with whole wheat flour) were special foods. Minor oilseeds such as Linseed and Niger were roasted and powdered to make *chutney* powders, which are important food accompaniments in this part of Karnataka. They were common in daily cuisine and prepared specially for festivals.

The classification of foods according to the main ingredient used in the traditional festival foods is presented in Table 2.

**Table 2: Major food groups in the preparation of festival foods.**

S. No. groups	Food	Sweet	Proportion (%)	Sav-oury	Proportion (%)	Total
1	Cereals	18	60-70	10	60-100	28
2	Millet	2	60-70	2	-	4
3	Pulses	15	60-70	8	70-90	23
4	Oil seeds	5	60-70	3	90-95	8
5	Milk	2	70-80	-	-	2
6	Meat	-	-	1	80-85	1
7	Vegetables	1	50-60	9	90-100	10
8	Fruits	1	80-90	-	-	1
9	Roots and Tubers	1	60-70	2	70-80	3
Total		45		33		78

It was observed that a majority of festival foods were based on cereals in both sweet and savory categories. The conventional pulses such as bengal gram and green gram also were the common ingredients. Sweet potato was the only root vegetable which was used as stuffing along with jaggery in preparation of stuffed pancake (similar to *Pooran Poli*). Foxtail millet was a conventional millet used in traditional sweet meat called *Hurakki Holige*, which had a shelf life of 3-4 weeks. More number of traditional savory foods were vegetable based. Characteristic to this region were the hot *chutney* powders prepared from Linseed, Groundnut and Niger. Linseed being a rich source of w-3 fatty acids is very commonly consumed in day-to-day life and a special food accompaniment with Bajra roti. Fruits did not constitute as main ingredients in any traditional savory festival foods. It is important to note that in a majority of traditional festival food preparations boiling, roasting, pan baking or pounding were the processing methods and deep frying was not a common method (Table 3) as indicated by the number of foods prepared during the festivities.

**Nutrient Composition:** Nutrient composition of traditional festival foods served in the main

**Table 3 : Festival foods and methods of cooking**

S. No.	Methods	Sweet	Savory	Total
1	Deep fat fried	5	7	12
2	Shallow fat fried	3	1	4
3	Open pan baking	4	2	6
4	Steaming	2	2	4
5	Boiling	11	7	18
6	Puffing	1	2	3
7	Combination of roasting and use of sugar	13	4	17
8	Mixing	2	-	2
9	Pounding	4	5	9
10	Germination	-	2	2
11	Fermentation	-	1	1
Total		45	33	78

course of meals are presented in Table 4. It was observed that, the calorific value of the sweet items ranged from 115 to 283 K cal per serving. Highest was recorded in *pumpkin gargi* and lowest in groundnut *laddu*. Protein content was high in *Kuchagadabu*, while, *Hurakki holige* recorded highest fat content 6.94g per serving. Similarly, gingelly seed *holige* recorded highest carbohydrate and calcium content but low sodium and potassium. Bajra *roti* was found to be highly nutritious, providing higher levels of energy, protein, calcium, iron, magnesium, copper and zinc than rest of the savory festival foods. *Undigadabu* was a low calorie food (38 K cal/serving) and jowar *wade* contained higher amounts of fat (12.79g/serving). *Akki huggi* a rice based product cooked in safflower seed milk was relatively rich in b carotene. Begum et al. (1998) analysed the nutrient composition of traditional foods such as ragi roti, ragi balls, bajra roti and wheat paratha and reported that calcium was found to be high in ragi roti and ragi balls (182 and 78 mg/100g, respectively), while iron content in bajra roti and wheat paratha (7.6 and 6.0 mg/100g, respectively). *Makki* roti, a traditional Punjabi food was reported to contain iron (6.8 mg/100 g) and copper (0.81 mg/100 g) in fairly high amounts (Bains et al., 1998).

Among the sweet food accompaniments, the calorie content ranged from 51 to 221 K cal/serving. *Modaka* and groundnut *laddu* were dense among the traditional sweet food accompaniments for calories and fat. In addition, groundnut *laddu* was also rich in protein, sodium and potassium. *Surali holige* was a rolled pancake stuffed with special sugar (recrystallized

Table 4: Nutrient composition (per serving) of main festival foods

Festival foods	Serving size		Energy (K cal)	Protein (g)	Fat (g)	Carbo- hydrate (g)	$\beta$ -carotene (mg)	Calcium (mg)	Iron (mg)	Sodium (mg)	Potassium (mg)	Magnesium (mg)	Copper (mg)	Zinc (mg)
	g	Mea- sure/n												
<b>Sweets</b>														
<i>Gudagana huggi</i>	110	1 Katori	214	3.85	2.80	43.12	8.80	56.10	2.31	5.50	105.27	107.03	0.22	0.77
<i>Hurakki holige</i>	50	3	234	3.16	11.50	29.40	9.85	24.75	1.20	3.45	59.10	20.15	0.17	0.42
<i>Karigadabu</i>	60	2	264	6.00	10.26	37.08	31.80	31.08	2.04	16.68	182.88	38.04	0.18	0.42
<i>Kuchagadabu</i>	70	2	201	6.94	1.62	40.25	36.88	31.70	2.28	20.86	215.46	45.70	0.35	0.63
<i>Madeli</i>	60	1 Katori	140	3.94	2.65	25.22	19.94	32.10	1.87	6.12	80.28	34.25	0.20	0.73
<i>Pumpkin gargi</i>	60	3	283	4.75	10.38	42.82	13.44	47.70	2.66	7.50	121.74	52.80	0.18	0.85
<i>Gingelly seed holige</i>	30	1	118	2.42	3.96	18.30	6.90	12.20	1.31	0.54	7.80	0.26	0.21	1.10
<i>Godhi huggi</i>	60	1 Katori	120	1.38	0.97	26.40	13.34	28.80	1.15	2.24	53.76	14.52	0.06	0.30
<i>Groundnut holige</i>	30	1	115	2.82	3.15	18.70	6.15	18.87	0.74	0.69	9.75	5.07	0.08	0.33
<i>Sajjaka</i>	55	1 Katori	119	1.54	0.15	27.80	0.55	20.24	0.72	2.92	11.44	0.66	0.00	0.00
<i>Sajjakada holige</i>	35	1	120	1.68	3.91	19.71	1.75	14.21	0.61	2.14	20.83	3.64	0.00	0.07
<b>Savory</b>														
<i>Bajra roti</i>	40	2	137	4.43	2.37	24.80	53.52	32.64	3.02	3.90	11.12	49.20	0.45	1.27
<i>Jowar wade</i>	35	3	119	2.22	7.40	10.85	53.10	8.33	1.94	4.48	50.75	32.48	0.18	0.00
<i>Akki huggi</i>	90	1 Katori	76	2.03	2.01	16.02	272.70	20.52	0.80	0.00	0.00	20.60	0.12	0.58
<i>Undigadabu</i>	20	4	38	1.14	0.21	8.06	5.22	2.76	0.45	0.80	14.54	5.22	0.05	0.16
<i>Bichagadabu</i>	40	2	54	1.92	0.27	11.10	4.64	7.68	0.78	3.20	50.40	21.32	0.08	0.35
<i>Jowar dosa</i>	35	1	94	2.03	2.31	16.42	6.97	4.45	0.65	1.06	19.6	31.56	0.61	0.56

Table 5: Nutrient composition (per serving) of festival food accompaniments

Festival foods	Serving size		Energy (K cal.)	Protein (g)	Fat (g)	Carbo- hydrate (g)	$\beta$ -carotene (mg)	Calcium (mg)	Iron (mg)	Sodium (mg)	Potassium (mg)	Magnesium (mg)	Copper (mg)	Zinc (mg)
	g	Mea- sure/ n												
<b>Sweets</b>														
Gingelly seed laddu	25	1	117	2.05	5.40	14.78	7.25	202.08	1.60	0	0	3.28	0.28	1.50
Roasted Bengal gram dhal laddu	30	1	79	2.07	0.84	15.90	9.88	18.70	1.16	0	0	0.44	0.05	0.03
Tambittu laddu	30	1	87	1.59	0.70	18.76	4.86	15.12	0.75	0.46	24.99	8.16	0.14	0.27
Bellada byali	30	1 Cup	55	1.77	0.14	11.61	10.2	1.23	0.42	2.22	86.10	7.02	0.09	0
Allittu laddu	30	3	88	1.77	0.95	11.76	2.40	15.3	0.63	1.5	28.71	29.19	0.06	0.21
Antinunde (Gum laddu)	30	1	122	1.38	6.37	17.64	5.91	14.85	0.72	2.07	35.46	12.09	0.10	0.25
Ground nut laddu	25	1	189	6.15	7.11	18.54	15.90	15.54	1.02	8.34	91.44	19.12	0.19	0.21
Gulladki laddu	50	1	65	1.87	2.57	14.38	13.17	11.35	0.81	7.45	76.95	16.32	0.18	0.23
Modaka fried	50	3	221	2.75	9.85	21.02	16.82	26.75	1.56	5.01	66.90	28.54	0.17	0.61
Shev laddu	25	1	95	2.35	2.48	17.84	5.60	19.88	1.11	3.13	50.73	22.01	0.08	0.36
Surali holige	40	2	142	3.00	3.52	24.56	7.20	33.06	1.20	4.20	89.60	14.36	0.08	0.28
Bevu bella	30	1 Katori	112	3.27	1.24	18.60	40.14	24.48	2.26	2.97	8.34	37.29	0.34	0.95
<b>Savory</b>														
Kuchchida khara	10	1 tea spoon	6	0.07	0.49	1.78	30.30	2.28	0.09	0.04	0.62	2.24	0.02	0.06
Bengal gram usali	17	1 Table spoon	29	1.09	1.01	4.06	6.12	5.94	0.34	3.76	41.14	7.58	0.06	0.10
Moth bean usali	20	1 Table spoon	37	2.24	0.51	6.12	1.63	24.52	0.91	2.74	101.16	20.19	0.08	0.02
Mesta bhaji	20	1 Table spoon	14	0.81	0.28	2.08	121.32	8.06	0.17	0.80	35.24	5.42	0.04	0.03
Zunaka	20	1 Table spoon	47	2.42	1.31	6.39	9.36	15.20	0.57	5.12	96.4	13.50	0.10	0.28
Bharita	15	1 tea spoon	16	0.74	0.21	0.30	72.06	11.90	0.23	1.58	45.77	5.94	0.06	0.24
Groundnut chutney	10	1 tea spoon	55	2.39	3.92	2.95	3.40	10.35	0.27	0.06	4.39	0.32	0.09	0.37
Linseed chutney	8	1 tea spoon	38	1.46	2.62	2.14	2.73	12.26	0.19	0.02	0.95	0.12	0.01	0.04
Niger seed chutney	8	1 tea spoon	36	1.75	2.76	1.27	0.33	21.28	0.40	0.02	0.42	0.64	0.04	0.08
Roasted Bengal gram dhal chutney	8	1 tea spoon	29	1.66	0.60	4.28	8.64	5.89	0.70	0.03	0.99	0.13	0.05	0.02

sugar called *mudde sakkare*) and condiments recorded high amounts of carbohydrates. *Bevu bella* a specific food of *Ugadi*, which is a New Year day for Kannadigas, recorded higher levels of b carotene iron, zinc and copper than other foods. *Bellada byali* (sweet dhal) recorded lowest carbohydrate and fat. Thus, it could be observed that festival foods though provided for variety in the diets, they could also contribute nutritious foods suitable for specific metabolic and physiological requirements.

Among the savory food accompaniments, the groundnut *chutney* powder recorded high values for calorific value and zinc, whereas, *Zunaka* for proteins carbohydrates and sodium contents. Mesta leaves *bhaji* relatively contained more quantities of b carotene. Moth bean is a conventional legume used very commonly in North Karnataka in the form of germinated *bhaji*. The dish recorded high values for calcium and iron. Interestingly, among traditional savory food accompaniments, Niger seed *chutney* powder recorded low values for calories and sodium, thus such foods could be revived for usage by the obese and hypertensive subjects (Table 5). Some of the traditional foods such as *Appam*, *Obbattu*, *Paniyaram*, *Ragi vada*, *Dhal Adai*, *Achappam*, *Avial Kesrai*, *Malayal adai*, *Cheeroti* and *Bisibelebhath* were reported to provide one fourth to one fifth energy requirements for a sedentary adult. *Cheeroti* and *Bisibelebhath* supplied one third of the protein requirements and also provided calcium, iron and carotene (Devdas, 1994). Kaur and Kawatra (1996) reported that *Khoa pinni* contained more moisture (14%)

than dhal pinni (11%) and Panjiri (2%). Ash and protein content were high in *Dhal pinni* (2.9 mg and 12.8 mg/ 100 g, respectively).

### CONCLUSION

A majority of festival foods were cereal based and were prepared by either roasting, open pan baking or boiling methods. Traditionally, fried foods were less in number. The nutrient computation revealed variation in the nutrient composition of the traditional festival foods. The nutrient dense foods with high protein, iron, fat, carbohydrate or energy were identified. There were many traditional festive foods low in fat, sodium, carbohydrates and calorific values.

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