Nutritive Analysis of Indigenous - Traditional Food Items of Tribal Community in Banswara District, India

VAAGDHARA

LANSA
Leveraging Agriculture for Nutrition in South Asia

SUMMARY

In the malnutrition affected Banswara district, India, food sovereignty march and focus group discussions were conducted with adult members of Bhil community. This helped in identification of traditional indigenous foods that were slowly-slowly disappeared from their diet. Study of nutritive values and quantitative estimation of nutritive value of some of the food items were conducted and collected from Indian food composition database. More than 100 food items of indigenous origin were identified, many of which were rich sources of micronutrients like calcium, iron, vitamin A, and folic acid. Utilization indigenous foods into routine diets can be leveraged to address malnutrition in tribal communities.

INTRODUCTION

Small and marginal families in rural areas of central -western tribal dominated junction of the three states of Rajasthan, Madhya Pradesh and Gujarat in India face a distinct transition in nutrition and dietary practices. Present food habits are generally associated with public distribution system, agriculture and other production environment in the area and market forces.

Since Green Revolution in India, wheat has become staples of small and marginal families' diet. Prior to this nutrition transition in India, traditional meals and recipes which were derived from local grains such as maize, bavta, kang, barley, and brown rice, were more commonly used in tribal cooking. These grains and re-introduction of culturally acceptable, traditional, carbohydrate-rich grains with high nutrient density may be a prudent step in reducing burden on under-nutrition in this population. Food systems of indigenous peoples who retain connection to long-evolved cultures and patterns of living in local ecosystems present a treasure of knowledge that contributes to well-being and health, and can benefit all humankind. To capture and document community knowledge, VAAGDHARA adapted participatory processes of learning and action. This paper is prepared with the intention of bringing out the nutritional strengths of the traditional food systems to bring nutrition transition in indigenous communities and fight malnutrition.

According to census 2011, in Banswara districts of South Rajasthan, India, scheduled tribes constitute of 76.4% of the total population (Census 2011). Bhil are tribe in Rajasthan, Madhya Pradesh and Gujarat. They predominantly depend on agriculture and animal husbandry for their livelihood along with some contribution from forestry, and labor with minor contribution from diverse occupations. Hungama report and global hunger index for the district ranks it high and studies have reported sub-optimal nutritional status of children and adults of this community. The changing climate situation and environmental degradation presents a challenge to the maintenance of livelihoods, agricultural, and environmental biodiversity.

Hundreds of indigenous foods like plants, animals, insects, and fungi are known to have food value, but the nutrient content of many of these foods are undocumented and an assessment of the patterns of their intake is not available. Thus, within the purview of larger study of revival of nutrition sensitive farming system component of assessment and analysis of nutritive value and traditional knowledge of indigenous foods was undertaken. It involved listing, identification and taxonomic classification of indigenous foods, followed by nutrient composition analysis of some specific items which were identified by community for analysis.

THE STUDY AREA - BANSWARA

This report is based on study conducted with 600 families of 30 villages in five clusters of Banswara district, Rajasthan, India. The area is inhabited predominantly by Bhil tribe, one among scheduled tribes of India. This area is selected because it is at the core of central-western tribal region of the country. This nutritional analysis is part of a larger study that evolved and documented a framework of participatory learning and action for the revival of nutrition sensitive farming system in addressing nutritional and food security among tribal communities of the region.

The research team included a qualitative researcher on farming system approach, field level staff equipped on nutrition sensitive farming and participatory learning tools and field level volunteers of VAAGDHARA, an NGO working with the mandate of overall tribal development. Most of the interaction at field level was in vagaditribal dialects and Hindi. Most of the data collected were in Hindi but some part in English also. The study was approved and supported byIDS through LANSA under regional guidance of MSSRF.

CAPTURING DATA ON INDIGENOUS FOOD

In the initial phase of study a campaign was launched in the district covering 20 villages and interacting with farmer leaders from 100 villages. In each 20 village focus group discussions, key informant's interviews, elder farmer's interviews were organized It was followed by an exhibition of indigenous crops and food items, where participating farmers brought some seeds for exchange with others. Later during rainy season PLA session were undertaken, in which women group made a visit in different parts of under the guidance of elderly women and men who could recall some not so practiced food items of indigenous communities. This helped in listing and classifying various indigenous foods and their role in diets of the Bhil community. Once list was completed other issues were listed including seasonality, part utilized, preference and access.

IDENTIFICATION OF FOOD SAMPLES

Based on the free listing activity done through FGDs, a list of commonly consumed indigenous food items was compiled (including cereals, legumes, vegetables, leafy vegetables, seeds, fruits, and animal foods). Samples of identified items were either provided by participants (if available) or were collected by the research team; these samples were with local experts and krishi Vigyan Kendra, Borvat (Banswara), Faloj (Dungarpur) and Badgaon (Udaipur). Identified uncommon food items were looked for their nutritive value in the Indian Food Composition tables for availability of the nutritive values of the classified foods. A list of some of the food items which could not be in the Indian food composition tables was prepared for collection for nutrient analysis.

The food samples short listed for nutrient analysis and available at the time of survey/sampling were collected from the field site or procured from the local market. Two hundred grams each of the vegetables/fruits/grains/flowers/green leafy vegetables of the samples was wrapped in paper envelop, placed in polythene bags, and sent to the National Accreditation Board for Testing and Calibration Laboratories (NABL) certified laboratory for analysis. The analysis was carried out in two batches owing to two seasons of availability of food items.

NUTRIENT ANALYSIS

The nutrient analysis was done according to standard reference protocols. The specific methodology is listed in annexed report. The parameters analyzed for the raw/uncooked samples included energy, carbohydrates, total fat, total carbohydrate, sugar, dietary fiber, vitamin A (as beta carotene), thiamine (vitamin B1), riboflavin (vitamin B2), niacin (vitamin B3), vitamin C, calcium, iron, zinc, sodium, and folic acid.

EXISTING AND TRADITIONAL DIETS OF TRIBAL COMMUNITIES

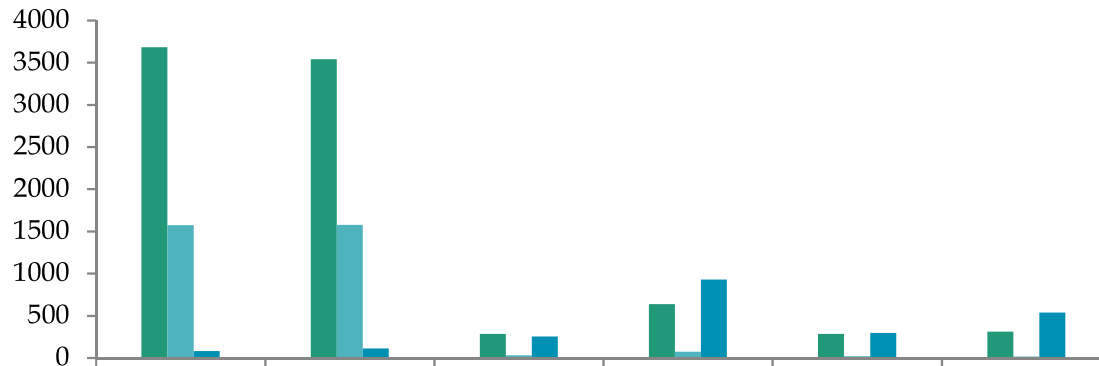
The qualitative enquiry revealed that traditionally maize was the staple food for the community. Maize is consumed in different forms namely Roti (bread), porridge. Some families do cultivate rice and consumed them in the form of puffed rice. Nowadays many families have started consumption of Gehu ki roti (wheat bread) as major cereal. Traditionally millets namely Bavta, kang, cheena, kodra, Kuri, Sama, were also known, but now negligible number of families are reported to grow and consume in limited quantity. Meals consisted of maize roti with lentil (Dal) of gram, green gram, cow-pea, and a local variety called Jalar. During rainy (monsoon) season a good number of green vegetables and leafy vegetables (LVs) area available from agriculture field and other common lands.Mostly these tribal families consume either Dal pulses or Sabji vegetables or saag (leafy vegetables). Consumption of tubers mainly Arbi,Ratalu, Garadu, Kandagola and Amarkanda is also reported.

The tool to identify gap between "what we consume and what we produce" has helped to identify at least 101foods items (given in table-9)which are traditional for the area, a separate is booklet is being prepared for the same. PLA exercise concentrated continued discussion about the changes in food habits from their traditional diets to present diets. Among all the listed food items, the nutritive values were available for in the Indian food composition tables 60 foods, shown as bold in table-9.

These included 20 foods from among those sent for classification to the botanist and those identified by common names as stated by participants during data collection. The nutritive value of these 20 foods was got tested from accredited lab, and values for many other foods were verified from literature and nutritive value was available in Indian food composition (indicated bold in table-9. For some of the community preferred foods identified 20 itemswere procured and sent for nutrient analysis to a NABL certified laboratory in Ahmedabad. Table-5provides their nutritive values as reported by the laboratory.

Indigenous plants used for medicinal purposes were identified during 5th session of PLA exercise, in which group made visit to village and underwent the process of identification of different food items during monsoon season. In general, majority of the plants were useful for easing stomach ailments, management of pain and fever and in improving overall health. Some of the key points from the nutrient analysis of twenty items carried out under study are;

NUTRITION VALUES OF LEAFY VEGETABLES (out of 100g)



	Dheemdi	Rajan	Garmela	Bokna	Karinjada	Kachnar Leaf
Zinc mg	5,72	2,24	3,89	4,19	7,4	8,12
Potassium mg	3680,52	3540,03	284,25	635,25	284,12	312,04
Magnesium mg	1572,84	1576,31	32,06	72,07	19,22	13,49
Phosphorus mg	80,9	110,82	253,15	926,16	295,17	537,11
Mangnese mg	4,84	3,6	8,72	3,72	3,02	1,48

- The nutrient analysis of Rajan, Dhimadi, Garmela revealed high potassium and Magnesium values.These saagwere the most versatile nutritive plant identified by the participants and highly preferred.
- The wild fruit Timru (DiospyrosMelanoxylon) has high levels of phosphorus (417.5 mg) Sodium (349.32mg) Calcium (201.79 mg) Potassium (261.99 mg) and Magnesium (123.2 mg) zinc which may be the reason for its efficacy in treating diarrhea.
- Bandar bati wild nut of tribal area has 51.56 f of fat of which 14.8 gram is saturated fat with no trans-fat and cholesterol, high levels of Potassium (359.98 mg), Magnesium (290.2 mg) Calcium (177.68 mg) and zinc (64.82 mg) which may be the reason why monkeys prefer them, no doubt they were our ancestors.
- The only flower food tested in the study has 74 g total carbohydrates, 12 g protein, 11 g dietary fiber and rich source of potassium (2391.67 mg), magnesium (369.25mg) phosphorus (210.8 mg)
- Besides green gram, black gram, pigeon-pea, chick-pea, tribal families alsoconsume Jalar (Fawa beans) and cow-pea. It has 67.9-gram carbohydrate, 18 g protein, potassium (1792.68 mg) magnesium (290.67 mg) and phosphorus (188.92 mg) and zinc 2.04 mg.
- The iron content of Chakod, saru, Bhaji, Lal bhaji (Amaranthus gangeticus), Gandhari, and Kanda leaves (Ipomea batata) were in the range of 3.49 to 38.5 mg/100 g.
- Some leafy vegetables are exceptionally rich in iron content Garmla (222 mg), Bokna (133 mg) Karinjda (78 mg) kachnar (189.0 mg), Chiel (mg) and Puwar (55.66 mg). These are also rich in vitamin-C content.
- Many indigenous leafy vegetables for which nutritive value is available in the Indian food composition tables namely Chakod (Cassia tora),Chiel (Arvi/ ghuiya (Colocasia anti-quorum), Chaulai (Amaranthus spinosus), and luniya (Portulaca olerecia) were seen to have high levels of beta carotene.
- Local varieties of minor millets (as indicated in table-9) Bavta, Kangdi, Cheena, and kodra are found to be complete in the form that they have all the three major nutrient groups Carbohydrates, protein and fats. Similarly, local rice varieties are also good source of Kodra and Pathariya rice.

Table Showing pictures of indigenous leafy vegetables of tribal community, Banswara district, India

KACHNAR

DHIMADI

RAJAN

BOKNA

GARMELA

KARINJADA

PALASH FLOWER

TIMRU FAL

BANDAR BATI

Table 2: Other nutritive values (out of 100g)of various millets and rice varieties from Banswara regions

S. N.	Sample	Total fat	Saturated fat	Total Carbohydrates	Dietary Fiber	Protein
		g	g	g	g	g
1	Bavta (mal)	7	1	69	3	13
2	Kangdi	6	1	71	7	14
3	Cheena	4	1	75	8	13
4	Kodra	10	2	71	5	9
5	Patharia rice	1	0	79	1	9
6	Colum rice	1	0	77	1	12
7	Kali kamod rice	1	0	80	1	0
8	Jalar	1	0	67	1	18
9	Bhaver lath	1.29	0.69	84.66	NA	2.86

Table : Mineral contents of various millets and rice varieties from Banswara regions

S.N.	Sample	Calcium	Iron	Zinc	Sodium	Potassium	Magnesium	Phosphorus	Manganese
		%	%	mg	mg	mg	mg	mg	mg
1	Bavta (mal)	0.30	0.19	2.12	45	1619.3	217.79	70.3	4.42
2	Kangdi	0.22	0.14	4.92	36	832.04	132.41	96.42	1.59
3	Cheena	0.15	0.24	3.46	36	596.72	103.15	82.3	1.36
4	Kodra	0.09	0.19	2.4	25	555.25	146.54	76.36	1.28
5	Patharia rice	0.06	0.11	1.68	18	31.52	77.06	62.12	0.78
6	Colum rice	0.01	0.06	0.94	25	58.99	31.73	60.38	0.4
7	Kali kamod rice	0.04	0.09	1.06	14	57.46	28.33	58.32	0.91
8	Jalar	0.06	0.12	2.04	20	1792.68	290.67	188.92	1.7
9	Bhaver lath	3.04	0.38	1.29	505	2274.28	475.33	24.01	0.39

The pulses consumed, namely Tuar (Pigeon pea) Urad (vigna munga), Moong (vigna radiate), Chana, Jalar (Fava beans) and Barbatti (Vigna catjang), were rich sources of thiamine and iron.


JALAR


KANDAGOLA


VALEN KAKADI


BHANWAR-LAT

Table 4 Showing pictures of indigenous leafy vegetables of tribal community, Banswara district, India

PATHARIYA

COLOMA

KALI KAMOD

CHEENA

BAVTA/MAL

KODRA

KAANG

- Dhimdi (Amranthus virdis) leaves 100 grams contains contains 283 calories, 34.2g protein, 5.3g fat, 44.1g carbohydrate, 6.6g fiber, 16.4g ash, 2243mg calcium, 500mg phosphorus, 27mg iron, 336mg sodium, 2910mg potassium, 50mg vitamin A, 0.07mg thiamine, 2.43mg riboflavin, 11.8mg niacin and 790mg ascorbic acid.
- The district has a high potential in the form of leafy vegetables Dhimda (Amranthus varity), Rajan, Chiel bathua.
- The tuber Amba haldi (Curcuma Aambaa) white turmeric with mango fragrance was considered blood purifiers and used for making chatni.
- The seeds of the chakod plant were used to treat tuberculosis. The participants identified the use of koraiya bark (Holarrhena antidysenterica) as a local treatment for heat stroke. They mix koraiya with hadiya or fermented rice wine. Charaigodwa and mahua fruit were used to relieve pain and swelling. Katai leaves could be applied to cuts.
- Tribal families also use fresh tender leaves of tamarind, kachnar as vegetable.
- A good number of tribal families are also reported to dry and store leaves of rajan, dhimda, dhimadi, ambadi, for use in off season i.e. summer months

DISCUSSION

Our analytical study on traditional indigenous foods items which are available and consumed by few tribal families in the Banswara district, have potential to provide rich nutrition to the community. Many micronutrient rich plant foods (different food groups) which were part of their daily dietary intake, but now at the verge of extinction. There are a good number of food items which are still preferred and consumed which are rich in sodium, potassium, iron, calcium, vitamin A, vitamin-B and vitamin C. The food items which were analyzed for their nutrition content as part of the study were also found to be good sources of one or more micronutrients.Some of these indigenous foods also reportedly had medicinal properties which were known to the local community based on practical knowledge and traditional wisdom.

Based on some of our findings and evidence from previous literature, there is likely a scientific basis to these beliefs.Supporting and advocating for the consumption of indigenous plants for their nutritive values and medicinal properties through knowledge and behavior change communication and policy interventions could present opportunities for improving community health outcomes.While people know about the rich diversity of the flora in the district of Banswara and isolated efforts by individuals and groups are underway to conserve the natural biodiversity for food and livelihood security, documentation of nutrient content of May such food items are rare. In this direction, our findings are significant in a situation of high rates of chronic malnourishment in all population groups of Bhil tribe in the areawhich compromises the health and well-being of women and children and the community at large. The enormous natural diversity present in the indigenous foods with the potential to contribute to nutritionally complete dietary patterns, the existence of trans-generational knowledge of their uses within the community and the ease of assimilation of these foods into the routine diets of the tribal can be leveraged to address malnutrition. Listing and identification of more underutilized food items and incorporating testing of their nutritive value and developing education materials at a community level would be important for reviving place in their diets. In this context of promoting nutrition kitchen garden could be used as effective strategies for consumption of indigenous foods for improved nutrition.

CONCLUSION

Our study is an important step towards documenting the nutrient rich indigenous foods in this tribal community which could be used for quantification of nutrient intake in this community. To the best of our knowledge, no previous study has looked at the dietary and nutritional aspects of the indigenous foods in the tribal of Banswara district. We would also like to highlight that there are many more such indigenous food items yet to be identified in adjoining districts offering immense scope of further study in this geographical area with such tremendous food and plant biodiversity and help community in fighting malnutrition.

Table 5 List of Parameters and Relevant Methodological Details for Nutrient Analysis

S. No	Test parameter/Standard	Method of testing	Methodology	Reference method
1	Energy, Kcal/100g	IFS/C/STP/FC/008	NIN	1. IS 14433: 2007 (Reaff. 2012); Clause 6.10.1 C
				2. IS 1656: 2007 (Reaff. 2012); Appx. C.
2	Protein (N × 6.25), %	IS: 7219-1973	Titrimetric	
3	Total Fat, %	IFS/C/STP/FC/012	Gravimetric	IS: 4684: 1975
4	Total Carbohydrate, %	IFS/C/STP/FC/013	By difference	1. IS 1656-2002
				2. AOAC 19th ed. 986.25 (2010), Method E
5	Sugar, %	IFS/C/STP/FC/010	Titrimetric	FSSAI Manual of Methods of Analysis of Food, Lab Manual 4
6	Dietary Fiber, %	IFS/C/STP/FC/007	Kit method	Sigma Kit based on AOAC 985.29
	Vitamins			
7	Vitamin A (as ß-carotene), mg/100 g	IFS/C/STP/LC/025	HPLC	International Food Research Journal 19 (2): 531–535 (2012).
8	Vitamin B1, B2, B3, mg/100 g	IFS/C/STP/LC/002	HPLC	AACC.1995.86–90 and Roche Analytical Manual
9	Vitamin C, mg/100 g	IS: 5838-1970	HPLC	
10	Folic Acid, µg/kg	IFS/M/STP/027	ELISA	
	Minerals			
11	Calcium, mg/100 g	IFS/C/STP/AAS/004	AAS	AOAC 999.10 and AOAC 999.11
12	Iron, mg/100 g	IFS/C/STP/AAS/004	AAS	AOAC 999.10 and AOAC 999.11
13	Zinc, mg/kg	IFS/C/STP/AAS/004	AAS	AOAC 999.10 and AOAC 999.11
14	Sodium, mg/100 g	IFS/C/STP/AAS/004	AAS	AOAC 999.10 and AOAC 999.11

Table 6 Results of Vitamin-B complex among ten preferred food items of

S.N.	Food Items	Vitamin B 1	Vitamin B 2	Vitamin B 3	Vitamin B6	Vitamin B9	Vitamin B12
		mg	mg	mg	mg	mcg	mcg
1	Bavta (mal)	0.89	0	1.03	0	0	2.88
2	Kangdi	1.12	0	0.56	0.39	1.22	1.08
3	Cheena	1.03	0	0.76	0	0	2.42
4	Dheemdi	0.32	0.21	0	0	0	2.06
5	Rajan	1.06	0.32	0	0	1.32	2.03
6	Garmela	0.12	0.15	0	0	0	0
7	Bokna	0.16	0.22	0	0	0	0
8	Karinjada	0.23	0.052	0	0	0.008	0
9	Balen Kakadi	0.12	0.04	0.1	0.032	0.005	0
10	Kachnar Leaf	0.18	0.04	0	0	0	0

Table 7 Nutrient analysis report summary of general indicators

S.N.	sample	Calories/ 100 gms	Total fat	Saturated fat	Trans fat	Cholesterol	Sodium	Total Carbohydrates	Dietary Fiber	Sugars	Protein
			g	g	g	mg	mg	g	g	g	g
1	Bavta (mal)	119	7	1	0	0	45	69	3	0	13
2	Kangdi	364	6	1	0	0	36	71	7	0	14
3	Cheena	356	4	1	0	0	36	75	8	0	13
4	Kodra	378	10	2	0	0	25	71	5	0	9
5	Patharia rice	195	1	0	0	0	18	79	1	0	9
6	Colum rice	230	1	0	0	0	25	77	1	0	12
7	Kali kamod rice	240	1	0	0	0	14	80	1	0	0
8	Dheemdi	29	1	0	0	0	221	62	14	3	13
9	Rajan	49	3	0	0	0	24	59	8	0	22
10	Palash flower	68	2	0	0	0	21	74	11	0	12
11	Jalar	127	1	0	0	0	20	67	1	0	18
12	Lambda Leaf (Garmela)	79	2	1	0	0	635	56	6	0	12
13	Bokna	122	2	1	0	0	210	50	4	0	8
14	Kandagola	220	1	0	0	0	235	27	1	0	1
15	Karinjada	165	1	0	0	0	630	24	2	0	4
16	Balen Kakadi	28	1	1	0	0	284	1	0	0	0
17	Kachnar Leaf	165.9	2	1	0	0	632	22	3	0	5
18	Bhaver lath	192	1.29	0.69	0	0	505	84.66	NA	0	2.86
19	Kanaj papdi	13	51.56	14.8	ND	ND	10.28	21.71	NA	2.27	21.41
20	Timru	101	0.77	0.35	ND	ND	349.32	30.21	NA	0	0.62

Table 8 Nutrient analysis report summary of micro-nutrients, minerals, vitamin-A and Vitamin-C

S. No.	Particulars	Vitamin A	Vitamin C	Calcium	Iron	Zinc	Potassium	Sodium	Magnesium	Phosphorus	Sulphar	Mangnese
		%	%	%	%	mg	mg	mg	mg	mg		mg
1	Bavta (mal)	0.00	0.21	0.30	0.19	2.12	1619.3	45	217.79	70.3	ND	4.42
2	Kangdi	0.02	0.11	0.22	0.14	4.92	832.04	36	132.41	96.42	ND	1.59
3	Cheena	0.01	0.12	0.15	0.24	3.46	596.72	36	103.15	82.3	ND	1.36
4	Kodra	0.01	0.22	0.09	0.19	2.4	555.25	25	146.54	76.36	ND	1.28
5	Patharia rice	0.00	0.00	0.06	0.11	1.68	31.52	18	77.06	62.12	ND	0.78
6	Colum rice	0.00	0.00	0.01	0.06	0.94	58.99	25	31.73	60.38	ND	0.4
7	Kali kamod rice	0.00	0.00	0.04	0.09	1.06	57.46	14	28.33	58.32	ND	0.91
8	Dheemdi	0.00	0.47	0.28	0.13	5.72	3680.52	221	1572.8	80.9	ND	4.84
9	Rajan	0.00	0.25	0.07	0.17	2.24	3540.03	24	1576.3	110.82	ND	3.6
10	Palash flower	0.00	0.20	0.06	0.12	2.14	2391.67	21	369.25	210.8	ND	1.15
11	Jalar	0.00	0.17	0.06	0.12	2.04	1792.68	20	290.67	188.92	ND	1.7
12	Garmela	0.01	0.10	2.56	2.22	3.89	284.25	635	32.06	253.15	1.39	8.72
13	Bokna	0.02	0.27	1.45	1.33	4.19	635.25	210	72.07	926.16	14.1	3.72
14	Kandagola	0.01	0.02	0.01	0.67	6.02	697.15	235	18.22	115.74	ND	4.17
15	Karinjada	0.00	0.17	0.00	0.78	7.4	284.12	630	19.22	295.17	ND	3.02
16	Balen Kakadi	0.00	0.03	0.02	0.17	0.89	135	284	11.4	28	0.82	1.4
17	Kachnar Leaf	0.02	0.22	0.04	1.89	8.12	312.04	632	13.49	537.11	ND	1.48
18	Bhaver lath	80IU	4.9	304	0.38	1.29	2274.28	505	475.33	24.01	2.9	0.39
19	Kanaj papdi	45IU	0.74	177.68	1.57	64.82	359.98	10.28	290.2	84.58	3.1	15.72
20	Timru	25IU	1.89	201.79	1.16	8.49	261.99	349.32	123.2	417.5	1.96	4.57

Table 9 Indigenous Foods with Edible Parts and the Place of Procurement

SL NO	Name of the food item	Genus	Species	English name	Part consumed	Season	Accessed/Grown
1	Pathariya (75 days)	Oryza	Sativa	Rice varieties	Grain	Kharif	Upland fields
2	Kolamba (90-100 days)					Kharif	Flat low lands
3	Kali Kamod (120 days)					Kharif	
4	Dimani (dhan)(90 days)					Kharif	
5	Desi Basmati (105 day)					Kharif	
6	Mal Kamod (75 days)					Kharif	
7	Jeera (105 days					Kharif	
8	Dhana har (90 days)					Kharif	
9	Sathi-White(70 days)	Zea	Mays	Makka (Maize)	Grain	Kharif	Field, market
10	Gangadi-Safad (90 days)					Kharif	
11	Pohata - mix color(75days)					Kharif	
12	Pili makka					Kharif	
13	Jwar -lal	Sorghum	aurdinacium	Sorghum	Grain	Kharif	Market
14	Jwar-Safed	Sorghum	aurdinacium			Kharif	
15	Kuri	Panicum	sumatrense	Little millet	Millet	Kharif	Mostly sloping lands
16	Kodra	Paspalum	scrobiculatum	Kodo millet		Kharif	
17	Cheena	Panicum	miliacium	Porso millet		Multiple	
18	Kang	Setaria	italica	Fox tail millet		Kharif	
19	Bavta	Eleusine	Coracana	Finger millet		Multiple	
20	Samali- small	Panicum	Miliare	Little millet		Kharif	
21	Sama - Large Size			Little millet		Kharif	
22	Gehu- Lokwan	Triticum	sativum	Wheat		Rabi	Field, Market, PDS
23	Gehu-Vajiya(un irrigated)	Triticum	sativum	Wheat		Rabi	
24	Gehu-Vajiya	Triticum	sativum	Wheat		Rabi	
25	Jau	horduem	vulgare	Barley		Rabi	Field
26	Jai (fodder)	Avena	sativa	Oats		Rabi	Fodder
27	Tuar - lal	Cajanus	Cajan	Pigeon pea		Kharif	Field, market
28	Tuar - Safed	Cajanus	Cajan	Pigeon pea		Kharif	
29	Tuar - Gujarati	Cajanus	Cajan	Pigeon pea		Kharif	
30	Jalar			Field beans		Kharif	
31	Chana -Kala Bada	Cicer	arietinum	Gram		Rabi	Field, market
32	Chana - Chhota	Cicer	arietinum	Gram		Rabi	
33	Urad - Kale	Vigna	Munga	Black gram		Kharif	
34	Mung- Hara-Khotadiya	Vigna	Radiata	Green gram		Multiple	

35	Mung- creeper	Vigna	Radiata	Green gram		Kharif	Field, market
36	Mung- Kala	Vigna	Radiata	Green gram		Multiple	
37	Masoor- chhota	Lens	culinaris	Green gram		Rabi	
38	Batli	Pisum	sativum	Pea		Rabi	
39	matar	Pisum	sativum	Pea		Rabi	field
40	Barbatti	Vigna	Sesquipedalis	Cow-pea	Seed	Kharif	Field
41	Safed Chavla	Vigna	unguiculata	Cow-pea		Kharif	
42	Channa leaves	Cicer	arietinum	Saag		Rabi	
43	Chiel	Chenopodium	Album	Bathua		Rabi	
44	Dhimda	Amaranthus	Viridis	Amranth		Annual	
45	Rajan					Annual	
46	Imali flower	Tamarindus	india	Tamarind		Perennial	
47	Garmela (Mor)	Celosia	Argentia	Silver cocks		Kharif	
48	Garmela (fleaf)	Celosia	Argentia	Silver cocks		Kharif	
49	Gunda (mor)			Cordia		Perennial	
50	Punwariya	Cassia	Tora	Cassia		Multiple	
51	Bokna					Kharif	
52	Ambadi-Lal	Hibiscus	Cannabinus	Sorel		Kharif	
53	Ambadi-Hara	Hibiscus	Cannabinus	Sorel		Kharif	
54	Vanajua				Leaves	Rabi	Weed, field
55	Kachnar	Bauhinia	verigata	Kachnar	Leaves	Perennial	Field
56	Tindorei ke dere	Trianthema	Monogyna		Leaves	Annual	Kitchen Garden
57	Chavle ke dere	Vigna	unguiculata	Cow-pea	Leaves	Annual	Kitchen Garden
58	Pyaj ke patte	Allium	Cepa	Onion	Leaves	Annual	Kitchen Garden
59	Lahsun ke patte	Allium	Sativum	Garlic	Leaves	Rabi	Kitchen Garden
60	Ghuiya Patte	Colocasia	Anti-quorum	Colocasia	Leaves	Kharif	Kitchen Garden
61	Malan Bathua				Leaves	Rabi	Kitchen Garden
62	Karinjada				Leaves	Annual	Weed, field
63	Sarso ka Saag	Brassica	Juncea	Mustard	Leaves	Rabi	Market
64	Sahajan	Moringa	Olifera	Drumstick	Leaves	Rabi	Field
65	Sathadi	trianthema	monogyna	Punarnava	Leaves	Annual	Weed, field
66	Sathadi	Bauhinia	Purpurea	Punarnava	Leaves	Annual	Weed, field
67	Dhimdi	Amaranthus	Gangeticus	Amranth	Leaves	Annual	Weed, field
68	Luniya	Portulaca	Olerecea	Purselane		Annual	
69	Sakar kand saag	Ipomea	Reptans	Sweet potato	Leaves	Kharif	Field
70	Palak	Spinacia	oleracea	Spinach	Leaves	Rabi	Kitchen Garden
71	Methi	Trigonella	foenum	Fenugreek	Leaves	Rabi	Kitchen Garden
72	Muli Patta	Raphanus	Sativus	Radish pods	Leaves	Rabi	Kitchen Garden
73	Sarso			Mustard	Leaves	Rabi	Kitchen Garden
74	Kikoda	Momordica	dioicia		Vegetable	Kharif	Field
75	Valore	Dolichos	Lablab	Field beans	Fruit	Rabi	Kitchen Garden
76	Chhodi valore	Dolichos	Lablab	Broad beans	Fruit	Rabi	Kitchen Garden
77	Mooli phal			Radish pods	Root	Rabi	Kitchen Garden
78	Barbatti	Vigna	Sesquipedalis	Cowpea pods	Fruit	Kharif	Field
79	kandagola	Dioscorea	Bulbifera	Tubers	Tuber	Kharif	Field
80	Ratalu	Dioscorea	Spp	Tubers	Tuber	Kharif	Kitchen Garden
81	Garadu	Dioscorea	Spp	Tubers	Tuber	Kharif	Kitchen Garden
82	Amar Kanda	Dioscorea	Bulbifera	Spring	Fruit	Kharif	Forest
83	Bandar Bati	Holoptelea	integrifolia	Kind of fruit	Fruit	Perennial	Field

84	Safed-Kaddu	Cucurbita	Maxima	Pumpkin	Fruit	Kharif	Kitchen Garden
85	Bada Kaddu	Cucurbita	Maxima	Pumpkin	Fruit	Kharif	Kitchen Garden
86	Lal batti	Cucurbita	Maxima	Pumpkin	Fruit	Kharif	Kitchen Garden
87	Chir boti - Makoi	Solanum	nigrum	Kind of fruit	Field, farm	Kharif	Weed, field
88	Umbar	Ficus		Banyan tree figs	Fruit	Perennial	Forest
89	Ber	Zizyphus	Jujube	Zizyphus	Fruit	Perennial	Field
90	Timru	Diospyros	Melanoxylon	Kind of fruit	Fruit	Perennial	Field, farm, forest,
91	Mahua	Madhuca	Latifolia	Mahua, ripe	Fruit	Perennial	Field, forest
92	Karounda	Carissa	Carandas	Kind of fruit	Fruit	Perennial	Forest
93	Dori tel	Madhuca	Latifolia	Mahua oil	Oil (from seed)	Perennial	Home, market
94	Mahua	Madhuca	Latifolia	Alcohol	Mahua	Perennial	Home, market
95	Alu	Solanum	Tuberosum	Potato	Stem	Annual	Market
96	Marela - round	Momordica	Dioicia	Bitter gourd	Fruit	Kharif	Weed, field
97	Karela Long	Momordica	Dioicia	Bitter gourd	Fruit	Kharif	Kitchen Garden[1]
98	Changeri	Oxalis	Corniculata		Leaves	Annual	Weed, field
99	Til	Sesamum	indicum	Sesamme	Grain	Kharif	Field
100	Keekar	pithecellobium	dulce	Manila tamarind	Fruit	Spring	Field
101	Amba haldi	Curcuma	Aambaa	White turmeric	Tuber	Kharif	Kitchen

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