

Standardization of Organoleptically Acceptable Low Glycemic Recipes for Diabetic Patients

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Abstract

The present study entitled “Standardization of organoleptically acceptable low glycemic foods” was conducted to develop low glycemic food products for diabetic patients by using locally available low glycemic foods. Total 26 low glycemic foods, which were locally available were identified and utilized for preparation of variety of products for diabetic patients. Total four breakfast items namely Moong dal paratha, Dhokla, Fara and peanut laddoo, three snacks items namely Salty biscuit, Oats lenil tikki and Peanut laddoo and two lunch / dinner items namely Gattae ki sabji and peanut sabji were developed. The cost of product ranged from Rs.8 to Rs.27/100g. Gattae ki sabji was least expensive where as Peanut laddoo was most expensive. The crude protein content was found minimum in Salty biscuit (9.46%) and maximum in Peanut laddoo (32.57%). The crude fat content was found minimum in Fara (5.63%) and maximum in Salty biscuit (32.49%). The mineral content was found minimum in Moong dal paratha (2.13%) and maximum in Peanut chat (7.5%). The crude fibre content was minimum in salty biscuit (0.74%) and maximum in Peanut sabji (3.71%) and peanut chat (3.71%). The carbohydrate content was minimum in Peanut laddoo (37%) and maximum in Fara (68%). The energy content was minimum in fara (378 Kcal) and maximum in Salty biscuit (716Kcal). The level of supplementation of fenugreek seed at 10% was acceptable in Salty biscuit, Oats lentil tikki and Peanut laddoo, were as in all the other products namely Moong dal paratha, Dhokla, Fara, Gattae ki sabji, Peanut sabji, Peanut chat supplementation up to 15% found to be most acceptable.

Keyword : Glycemic recipes, diabetic patients.

Introduction

Diabetes mellitus, represents a spectrum of metabolic disorders, which has become a major health challenge worldwide. The unprecedented economic development and rapid urbanization in Asian countries, particularly in India has led to a shift in health problems from communicable to non-communicable diseases^[1,3]. Of all the non communicable diseases, diabetes and cardiovascular diseases lead the list. Diabetes is a chronic condition marked by abnormally high levels of sugar (glucose) in the blood. People with diabetes either do not produce enough insulin, a hormone that is needed to convert sugar, starches and other food into energy, needed for daily life or cannot use the insulin that their bodies produce.

As a result, glucose builds up in the bloodstream. If left untreated, diabetes can lead to blindness, kidney disease and nerve disease and, heart disease and stroke. The diabetic patients generally get bored with a limited choice of foods/recipes^[6]. Therefore the present study was proposed with a aim to develop recipes using low glycemic foods that take longer time to digest so sugar is absorbed more slowly into the blood stream and therefore, less likely to cause abrupt rise in blood sugar level and to develop information material for diabetic patients in Hindi. Awareness^[4,5] regarding causes and prevention strategies to control this disease through modifications in lifestyle, diet etc. can be helpful in keeping a check on this

disease. Therefore, the present study was

Materials and Methods

The study entitled Standardization of organoleptically acceptable low glycemic recipes for diabetic patients was carried out during the academic session 2019-2020 in the Department of Food Science and Nutrition, College of Home Science, Narendra Dev University of Agriculture and Technology.

Selection of locally available low glycemic foods: foods available locally in the season were identified and utilized for standardization of organoleptically acceptable low glycemic products for diabetic patients.

Standardization of organoleptically acceptable low glycemic food products using fenugreek seeds as a core / essential ingredients:

The fenugreek seeds were purposively selected as a core / essential ingredient in all the developed products. Fenugreek (*Trigonella foenum graecum*) is a common herb (Sanskrit- Mthika; Hindi and Gujarati- Methi; Telugu- Mentikoora; Malayalam- Uluba). Its seeds are commonly used as a condiment for seasoning in

planned.

Indian homes. The medicinal qualities of fenugreek seeds are known since ancient times and have been described in Greek, Latin and Ayurvedic literature. It is reported that fenugreek seeds suppresses the urinary excretions of sugar and relieves symptoms of diabetes. Seeds of fenugreek are a rich source of fibre. It contains mucilaginous fibre and total fibre to the extent of 20 per cent and 50 per cent, respectively. In addition, it also contains trigonelline – an alkaloid, known to reduce blood sugar level. The supplementation of fenugreek seeds (soaked / unsoaked) upto 5, 10, 15 and 20 per cent were tried in all the developed low glycemic food products. Nine products namely *Moong dal paratha*, *Dhokla*, *Fara*, *Salty biscuits*, *Gattae ki sabji*, *Oats lentil tikki*, *Peanut sabji*, *Peanut laddoo* and *Peanut chaat* were prepared with the addition of 0, 5, 10, 15 and 20 per cent fenugreek seeds. The various other ingredients used for development of products were procured from the local market.

Table 1 Standardized low glycemic products for diabetic patients

S.No.	Name of product	Ingredients
1.	<i>Moongdal paratha</i>	Green gram dal-30gm, Wheat flour- 140gm,*Fenugreek seed-30gm, Broccoli - 20gm, Green chilli -2pc, Cumin seed powder- 1tsp, Coriander leaves- few, Refined- 20ml, Salt- to taste
2.	<i>Dhokla</i>	Bengal gram flour- 170gm, Curd- 20gm ENO-2pkt, *Fenugreek seed powder-30gm, Ginger, garlic, g. chilli paste- 2 tsp, Refined- 1tsp, Curry leaves- few, Mustard seeds- 2tsp, Green chilli- 4pcs, Salt- to taste
3.	<i>Fara</i>	Green gram dal- 15gm, Bengal gram dal- 15gm, Rice flour- 55gm, *Fenugreek seed- 5gm, Asafoetida- a pinch, Coriander leaf- few, Green chilli- 2pc, Salt- to taste
4.	<i>Salty Biscuits</i>	Refine flour-95gm, *Fenugreek flour- 5gm, Peanut (powder)- 20gm, Sugar- 20gm, Fat- 50gm, Cumin powder- 1tsp, Baking powder- a pinch, Salt- a pinch
5.	<i>Gattae ki sabji</i>	<i>For gatta-</i> Bengal gram flour- 85 gm, *Fenugreek- 15 gm, Cumin powder- a pinch, Salt- a pinch

		<i>For gravy-</i> Onion -1pc, Tomato- 1pc, Ginger (chopped)- 1tsp, Green chilli-2pc, Cumin seeds- 1tsp, Vegetable spices- 1 tsp, Vegetable Oil- 10ml, Green coriander leaves- few, Salt- to taste
6.	<i>Oats lentil tikki</i>	Lentil -60gm, Oats (powder)-30gm, *Fenugreek seed powder- 10gm, Curd- 50ml, Onion- 1pc, Green chilli- 2pc, Chaat masala- 2tsp, Red chilli powder- a pinch, Green coriander leaves- few, Imli chutney- 1 pack, Salt- to taste
7.	<i>Peanut sabji</i>	Peanut- 85gm, *Fenugreek seed-15gm, Onion- 150gm, Tomato- 65gm, Green chilli- 2pc, Vegetable spices- 1tsp, Coriander leaves- few, Cumin seeds- 1tsp, Ginger grated- 1tsp, Turmeric- ½ tsp, Vegetable oil-2 tsp, Salt- to taste
8.	<i>Peanut laddoo</i>	Groundnut- 52.5 gm, White sesame- 10gm, *Fenugreek seed- 7.5gm, Coconut-5gm, Cashewnuts-5gm, Almonds- 5 gm, Raisins- 5 gm, Sugar- 10 gm, Cardamom-2 gm, Milk-10ml
9.	<i>Peanut chat</i>	Peanut-85 gm, *Fenugreek seed- 15gm, Lemon-1pc, Chaat masala-2 tsp, Green chilli-2pc, Onion-1pc, Tomato (small)- 1pc, Coriander leaves- few, Salt-to taste

*In all the products supplementation of fenugreek seeds was done at 0, 5, 10, 15 and 20 per cent levels.

Sensory evaluation of standardized low glycemic products: The standardized low glycemic products were subjected to sensory evaluation by a panel of diabetic and non diabetic adult judges using nine point hedonic rating scale (Appendix).

Nutritional analysis of standardized low glycemic products: The nutritional composition of standardized organoleptically acceptable low glycemic products were determined using standard methods. For determination of nutritional

composition, the food sample were dried at 60 to 70°C in hot air oven, powdered and used for nutritional evaluation.

Moisture: Moisture content was determined by employing the standard method of analysis.

Procedure: Five gram sample was weighed in a petri-dish and dried in oven at 105°C for 6 hours. The sample was reweighed after cooling it in a dessicator. Moisture content was calculated by using following formula:

$$\text{Moisture (\%)} = \frac{\text{Loss in weight (g)}}{\text{Weight of sample (g)}} \times 100$$

Crude protein: Crude protein was estimated by standard method of analysis using KEL PLUS Automatic Nitrogen Estimation System. A factor of 6.25 was applied to convert the amount of nitrogen to crude protein.

Reagents:

- i) Hydrochloric acid (0.01N)

- ii) Boric acid solution (4%): Dissolved 40 g of boric acid in distilled water and diluted to one litre.

- iii) Sodium hydroxide solution (40%): Dissolved 400 g of carbonate free sodium hydroxide

- (NaOH) in distilled water and diluted to one litre.
- iv) Digestion mixture : K_2SO_4 : $CuSO_4$ (5 : 1)
 - v) Conc. Sulphuric acid
 - vi) Mixed indicator solution: 0.5 g of bromocresol green and 0.1 g methyl red was taken and dissolved in 100 ml 95 per cent ethanol and the solution was adjusted with drops of dilute NaOH to bluish purple colour

Procedure:

Digestion: The temperature of digestion system was set to 420⁰C in the controller. The samples and chemicals were prepared. The digestion tubes with samples + sulphuric acid + digestion mixture (3 g) were placed in insert rack and then the manifold was placed over the tubes. The insert rack + manifold were then loaded in the digestion block. The water connection was opened. After one to two hour the rack was removed and it was noted whether all the samples got digested. If not, the tubes were replaced in the block and were left for another 15 minutes. The end point of digestion was appearance of bluish green colour and flames got reduced. After

digestion, the insert rack was removed from the block and was placed in the cooling stand. It was removed slowly after 15 min till the tubes got cooled. Then finally, the water connection was closed. Now, the samples were ready for distillation.

Distillation: Firstly, the macro tube containing the digested samples was loaded in the space provided in the apparatus. One empty conical flask was put on the receiver side and ran the programme of the equipment. Boric acid (20 ml) automatically dropped into the conical flask. This was pink in colour initially. Then 40 ml of 40 per cent NaOH in auto mode was added slowly in the order of 10 ml each time (till the colour in the test tube changed from bluish green to brown precipitate). Then the process was set. After 6 min, the colour of contents in the conical flask changed from pink to green. This was the end point of distillation of the sample. The flask was taken out for titration.

Titration: Titrated the above solution with 0.01 N HCl till colour changed from green to permanent pale pink colour. This was the end point of titration.

$$\text{Total N (\%)} = \frac{14 \times \text{Titer value} \times \text{Normality of acid}}{1000 \times \text{sample weight (g)}} \times 100$$

Where,

Titer value = Volume of N/100 HCl used for titration.

Protein (%) = % N x 6.25

Crude Fat: Crude fat was estimated by employing the standard method of analysis (AOAC, 2000) using the Automatic SOCS plus Solvent Extraction System.

Procedure: Washed the fat extraction beakers thoroughly and dried them in hot air oven at 60⁰C. Took the weight of empty beakers. Five gram of moisture free sample was transferred into a pre-weighed

extraction thimble dried overnight. The thimble holder along with the sample was kept into the fat extraction beaker. Took required quantity (100 ml) of petroleum ether (boiling point 60-80⁰C) into the beaker. Loaded the beakers into the system and set temperature 90⁰C (according to boiling point of solvent) in the controller. The extraction was carried out for one hour at 90⁰C. After the completion of extraction period, the temperature was raised to 110⁰C, closed the stopper in order to collect the solvent in the solvent

compartment. Removed the beaker along with the fat and kept in hot air oven at

60°C temperature, till a constant weight was obtained.

The beaker was weighed after cooling it in a dessicator.

$$\text{Fat (\%)} = \frac{W_2 - W_1}{W} \times 100$$

Where,

W = Weight of sample (g)

W₁ = Weight of empty beaker

W₂ = Weight of beaker with fat

Crude fibre: The crude fibre was estimated by employing the standard method of analysis.

Reagents: Sulphuric acid stock solution (10%) v/v: Diluted 55 ml concentrated sulphuric acid to one litre.

- Sulphuric acid working solution (1.25%): Diluted 125 ml of stock solution to one litre.
- Sodium hydroxide stock solution (10%) w/v: Dissolved 100 g of NaOH in distilled water and diluted to one litre.
- Sodium hydroxide working solution (1.25%): Diluted 125 ml stock solution to one litre with distilled water.
- Antifoam (2%): Silicon in CCl₄

Procedure: One gram fat free oven dried sample was put in one litre tall beaker and

$$\text{Crude fibre (\%)} = \frac{W_2 - W_3}{W_1 (g)} \times 100$$

Where,

W₁ = Weight of sample (g)

W₂ = Weight of insoluble matter (wt. of crucible + insoluble matter – wt. of crucible)

W₃ = Weight of ash (wt. of crucible + wt. of ash – wt. of crucible)

Total Ash: Ash in the sample was estimated by employing the standard method of analysis.

$$\text{Ash (\%)} = \frac{\text{Weight (g) of ash}}{\text{Weight (g) of sample}} \times 100$$

200 ml 1.25 per cent H₂SO₄ and a few drops of antifoam were added. Then it was heated to boiling in the crude fiber apparatus and kept the solution boiling for 30 min under bulb condenser. Beaker was rotated occasionally to mix the contents and particles were then filtered through Buchner funnel and the sample was washed back into the tall beaker with 200 ml NaOH (1.25%). It was again brought to boiling point and boiled for exactly 30 min. All the insoluble matter was transferred to the sintered crucibles by means of boiling water till acid free. It was washed twice with alcohol followed by three times washing with acetone and dried at 100°C to constant weight. The crucibles were put in a muffle furnace at 550°C for 1 h and then cooled in a dessicator and reweighed.

Procedure: Five g of oven dried sample was weighed in a weighed silica crucible. It was ignited till no charred particles remained in the crucible. Then the crucible was put in muffle furnace (550°C) for 5-6 hours until a white ash was obtained. Then crucible was cooled in a dessicator and weighed. The loss in weight represented the organic matter and residue being the ash content which was calculated using the following formula:

Dry matter: Moisture value was subtracted from 100; the difference gave values of available dry matter.

Dry matter (%) = 100 – Moisture value

Carbohydrates: Added the values of moisture, crude protein, crude fat, crude fibre, total ash and subtracted from 100. The difference gave the values of available carbohydrate.

Carbohydrate (%) = 100 - (Moisture + crude protein + crude fat + crude fibre + total ash)

Result and Discussion

Screening of low glycemic foods:

Different carbohydrates raise the blood sugar to variable extents. While, recommending a diet for a diabetic it is therefore important to know the extent of rise in blood sugar in response to a food in

Energy: The energy content was calculated by factorial method.

Energy (kcal) = 4x carbohydrate + 4x crude protein + 9x crude fat

Economics of developed low glycemic food products: The cost of developed products was calculated by using the cost of raw materials used. The fuel and labour charges are not included.

comparison with the response to an equivalent amount of glucose. Glycemic index is therefore, important and useful in planning diets for diabetics. A list of low glycemic foods was proposed and presented in Table 1.

Table 1 Screening of low glycemic foods

S.No.	Food	GI	S. No.	Food	GI
1.	Hummus (soaked chick pea paste)	6	21	Green lentis	29
2.	Broccoli	10	22	Whole milk	30
3.	Onion	10	23	Black beans	30
4.	Mushrooms	10	24	Skim milk	32
5.	Peanuts	13	25	Pizza	33
6.	Yogurt plain	14	26	Apple	34
7.	Yogurt low fat	14	27	Yam	35
8.	Cauliflower	15	28	Soya	36
9.	Celery	15	29	Linseed	36
10.	Cucumber	15	30	Par boiled white rice	38
11.	Green beans	15	31	Baked beans	40
12.	Brinjals	15	32	Natural muesli	40
13.	Peppers	15	33	Chick pea / Bengal gram	42
14.	Spinach	15	34	Orange	43
15.	Soya bean	16	35	Custard	43
16.	Barley	19	36	Dates dried	45
17.	Red lentils	21	37	Oat meals	45
18.	Cherries	22	38	Grapes	46
19.	Plums	24	39	Sweet corn	47
20.	Peaches	28	40	Green peas	48

Selection of locally available low glycemic foods:

After screening, the low glycemic index foods, a list of the locally available

low glycemic index foods was prepared and presented in Table 2 to develop low glycemic recipes/ food products for diabetic patients.

Table 2 Selected locally available low glycemic foods

S. No.	Foods	GI	S. No.	Foods	GI
1	Broccoli	10	14	Red lentils	21
2	Cabbage	10	15	Chana dal	22
3	Onion	10	16	Dark chocolate	22
4	Mushrooms	10	17	Green lentil	29
5	Peanuts	13	18	Yam	35
6	Cauliflower	15	19	Linseed	36
7	Cucumber	15	20	Soya	36
8	Egg plant	15	21	Natural muesli	40
9	Greens beans	15	22	Coconut milk	41
10	Spinach	15	23	Chick pea	42
11	Tomato	15	24	Coconut	45
12	Walnuts	15	25	Oat meal	45
13	Barley	19	26	Green peas	51

Standardization of organoleptically acceptable low glycemic recipes / food products using fenugreek seeds as a core/ essential ingredients:

Using the foods given in Table 2, nine low glycemic recipes / food products were standardized for diabetic patients namely *Moong dal paratha, Dhokla, Fara, Salty biscuits, Oats lentil tikki, Gattae ki sabji, Peanut chaat, Peanut laddoo and Peanut sabji*. Table 3 (Given in last Page) shows the product developed by using low glycemic foods such as- *Moong dal paratha, Dhokla, Fara, Salty biscuits, Oats lentil tikki, Gattae ki sabji, Peanut chaat, Peanut laddoo and Peanut sabji* with the supplementation of fenugreek^[7].

Sensory evaluation of standardized low glycemic recipes / food products:

The results of the present studies presented in table 4 revealed that supplementation of fenugreek seed powder up to 10 per cent was acceptable in *Salty biscuits, Oat-lentil tikki and Peanut laddoo*, whereas, in all the other

preparations namely *Moong dal paratha, Dhokla, Fara, Gattae ki sabji, Peanut sabji, Peanut chat* supplementation up to 15 per cent found to be most acceptable. Preparations containing 12.5 g of fenugreek seeds namely *Adai, Chapatti, Daliya, Dhokla, Dosai, Idli, Paratha, Pesarattu, Pongal, Ragi idli, Ragi roti, Rava dosai, Vegetable omelette and Upma* were standardized at National Institute of Nutrition, Hyderabad (Raghuram et al., 2008) reported that fenugreek seed powder can be incorporated in preparation such as chapatti, rice, dal and vegetables etc. All the preparations were reported to be palatable and acceptable to volunteers. Incorporation of fenugreek seeds reduced the glycemic index of preparations by 10 to 20 per cent. Peanuts are relatively low in carbohydrates (six grams per one ounce of peanuts, with 2 grams of fiber). Peanuts contain fiber and magnesium, both of which increase the body's ability to use insulin and have been inversely associated with risk of type 2 diabetes^[2].

Table 4 Sensory evaluation of standardized low glycemic recipes / food products

Products	Level of supplement of fenugreek seeds				
	0%	5%	10%	15%	20%
<i>Moog dal paratha</i>	8.85 Like extremely	8.90 Like extremely	8.88 Like extremely	8.86 Like extremely	6.00 Like slightly
<i>Dhokla</i>	8.45 Like very much	8.42 Like very much	8.39 Like very much	8.38 Like very much	6.69 Like moderately
<i>Fara</i>	7.5 Like very much	8.92 Like extremely	8.90 Like extremely	8.80 Like extremely	7.02 Like moderately
<i>Salty biscuit</i>	8.5 Like extremely	7.59 Like very much	7.54 Like very much	7.04 Like moderately	6.13 Like slightly
<i>Gattaa ki sabji</i>	8.00 Like very much	9.00 Like extremely	9.00 Like extremely	9.00 Like extremely	7.29 Like moderately
<i>Oats lentil tikki</i>	7.8 Like very much	8.35 Like very much	8.30 Like very much	7.00 Like moderately	6.15 Like slightly
<i>Peanut sabji</i>	8.6 Like extremely	8.90 Like extremely	8.92 Like extremely	8.88 Like extremely	7.36 Like moderately
<i>Groundnut laddoo</i>	8.00 Like very much	7.43 Like moderately	7.24 Like moderately	6.45 Like slightly	5.17 Neither like nor dislike
<i>Peanut chat</i>	7.5 Like very much	8.90 Like extremely	8.89 Like extremely	8.76 Like extremely	7.27 Like moderately

*Nine Point Hedonic Rating Scale

Nutritional analysis of standardized low glycemic recipes / food products:

The crude protein content was found minimum in *Salty biscuit* (9.46%) and maximum in *Peanut laddoo* (32.57%). The crude fat content was found minimum in *Fara* (5.63%) and maximum in *Salty biscuit* (32.49%). The mineral content ranged from 2.13 per cent in *Moong dal paratha* to maximum in *Peanut chat* (7.5%). The crude fibre content was minimum in *salty biscuit* (0.74%) and maximum in *Peanut sabji* and *peanut chat* (3.71%). The carbohydrate content was minimum in *Peanut laddoo* (37%) and maximum in *Fara* (68%). The energy

value of various preparations ranged from 378Kcal in *fara* to 716Kcal per 100gram in *Salty biscuits*. Raghuram et al. (2008) reported the nutritive value of recipes standardized for diabetic patients namely *Adai, Chapatti, Daliya, Dhokla, Dosai, Idli, Paratha, Pesarattu, Pongal, Ragi idli, Ragi roti, Rava dosai, Vegetable omelette* and *Upma* the energy values of the preparations ranged from 345 kcal to 530 kcal per 100g, protein from 10 to 20 g, fat 2to 10g and carbohydrates from 44 to 73g^[8,9].

Table 5 Nutritional analysis of standardized low glycemic foods

S.No.	Product name	Moisture	Protein	Fat	Ash	Fibre	Carbohydrate	Energy
1	Moong dal paratha	4.90	14.48	20.66	2.13	2.36	55	466
2	Dhokla	4.30	19.25	16.55	5.10	2.18	53	436
3	Fara	6.70	13.75	5.63	4.30	1.49	68	378
4	Salty biscuit	1.90	9.46	32.49	2.53	0.74	53	716
5	Gattae ki sabji	4.60	16.50	17.16	7.20	3.37	51	425
6	Oats lentil tikki	3.40	18.60	21.16	2.80	1.14	53	476
7	Peanut sabji	3.90	25.43	22.83	6.50	3.71	38	458
8	Groundnut laddoo	2.2	32.57	19.66	5.10	3.02	37	457
9	Peanut chat	4.8	24.5	16.78	7.5	3.71	43	420

Economics of developed low glycemic recipes / food products (Rs/100gm):

The cost of developed products was calculated by using the cost of raw

materials used. The fuel and labour charges are not included.

Table 6 Economics of developed low glycemic foods (Rs/100gm).

S. No.	Product	Cost (Rs/100gm)*
1	Moong dal paratha	12
2	Dhokla	25
3	Fara	15
4	Salty biscuit	10
5	Gattae ki sabji	8
6	Oats lentil tikki	18
7	Peanut sabji	13
8	Peanut laddoo	27
9	Peanut chat	22

***Fuel and labour charges not included**

Table 6 shows the cost of low glycemic food products. Among all products Gattae ki sabji (Rs.8.00/100g) were least expensive as compared to other

products and Peanutnut laddoo was most expensive (Rs.27.00/100g). This variation is due to the different ingredients used in making different products.

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Table 3 Standardized low glycemic recipes / food products for diabetic patients

S. No.	Name of product	Ingredients	Method	Cooked weight (gm)	No. of serving
1	<i>Moong dal paratha</i>	<ul style="list-style-type: none"> Green gram dal-30gm Wheat flour- 140gm Fenugreek seed*-30gm Broccoli - 20gm Green chilli -2pc Cumin seed powder- 1tsp Coriander leafs- few Refined- 20ml Salt- to taste 	<ul style="list-style-type: none"> Cleaned, washed and soaked green gram dal for 2 hours. Drain well. Combined all ingredients except refined in a deep bowl and kneaded into soft dough by using enough water. Divided the dough into 9 equal portions and made circular chapatti. Heated a non- stick tava and cooked each paratha by using little amount of refined till they turn golden brown in colour from both sides. 	300gm	3
2	<i>Dhokla</i>	<ul style="list-style-type: none"> Bengal gram flour- 170gm Curd- 20gm ENO-2pkt Fenugreek seed powder* - 30gm Ginger, garlic, g. chilli paste- 2 tsp Refined- 1tsp Corry leafs- few Mustard seeds- 2tsp Green chilli- 4pcs Salt- to taste 	<ul style="list-style-type: none"> Take all ingredients to prepared batter except refined. Kept the batter in a greased baking tray in a pre-steamed steamer for 10- 15 minutes. Take out baking tray from steamer and let them cool for few minutes. Cuttet fluffy dhokla into small square pieces using knife. Heated oil in a pan. Added mustard seed, when it begins to crackle, added curry leaves, green chillies and sauted them for few seconds. Poured it over dhoklas and tossed gently until each dhokla is coated well. 	350	5
3	<i>Fara</i>	<ul style="list-style-type: none"> Green gram dal- 15gm Bengal gram dal- 15gm Rice flour- 55gm Fenugreek seed*- 5gm Asafoetida- a pinch Coriander leaf- few Green chilli- 2pc Salt- to taste 	<ul style="list-style-type: none"> Soaked green gram dal and Bengal gram dal for 4-5 hours. Made the roughage paste of all ingredients except rice flour. Made soft dough of rice flour with the help of wrm water. Devided the dough into several (28 pcs) like ball and made it like thick puri. Added the dal paste on one side of the puri and covered with other side. Cooked the fara in a pre steamed steamer for 20 minutes. Take out the fara in a plate. 	180	4
4	<i>Salty biscuit</i>	<ul style="list-style-type: none"> Refine flour-95gm Fenugreek flour*- 5gm Peanut(grind)- 20gm Sugar- 20gm Fat- 50gm Cumin powder- 1tsp 	<ul style="list-style-type: none"> Sieved the flour, salt fenugreek flour, baking powder twice or thrice. Creamed ghee. Added sugar powder and creamed it again. Added flour and mix well. Kneaded the dough and rolled it into medium thickness sheet. Cutted into desired shapes using biscuit cutter. Baked 160Cfor about 25 minutes or till brown colour. 	180	4

		<ul style="list-style-type: none"> • Baking powder- a pinch • Salt- a pinch 			
5	<i>Gatae ki sabji</i>	<p><i>For gatta-</i></p> <ul style="list-style-type: none"> • Bengal gram flour- 85 gm • Fenugreek*- 15 gm • Cumin powder- a pinch • Salt- a pinch <p><i>For gravy-</i></p> <ul style="list-style-type: none"> • Onion -1pc • Tomato- 1pc • Ginger (chopped)- 1tsp • Green chilli-2pc • Cumin seeds- 1tsp • Vegetable spices- 1 tsp • Vegetable Oil- 10ml • Green coriander leafs- few • Salt- to taste 	<p><i>For gatta-</i></p> <ul style="list-style-type: none"> • Mixed all the ingredients. • Made soft dough with the help of water. • Devided it into 7-8 portions. • Made roll like cylinder of each portions. • Cooked it into preboilled wter for 8-10 minutes until they start to float on the surface of water. • Removed the rolls from water. Kept remining water for gravy. Let them cool. • Cut every roll into pieces like gatta. • Sauté the gatta for 2-3 minutes. <p><i>For gravy-</i></p> <ul style="list-style-type: none"> • Heated oil in a pan. • Added cumin seeds. • When it crackles added sliced onion and grated ginger. Cooked until golden brown. • Add paste of spices and sauté for few minute. • Added fine chopped tomatoes and cooked for 2 minutes. • Added remaining water (gatta) for gravy. • Cokked until thick consistency. • Garnished with coriander leafs. 	600	4
6	<i>Oats lentil tikki</i>	<ul style="list-style-type: none"> • Lentil -60gm • Oats (powder)-30gm • Fenugreek seed powder*- 10gm • Curd- 50ml • Onion- 1pc • Green chilli- 2pc • Chaat masala- 2tsp • Red chilli powder- a pinch • Green coriander leafs- few • Imli chutney- 1 pack • Salt- to taste 	<ul style="list-style-type: none"> • Cleaned, washed and boiled the lentil in 1 cup water till dal is soft and cooked and all the water has evaporated. • Blend the dal in a mixer to a corse paste. • Transferred it to a bowl and add oats, fenugreek powder, and mix well. • Devided the mixture into 8 equal parts and shape each portions like tikki. • Cook each tikki on non stick tava by using oil till they turn golden brown in colour. • Garnished it with fine chopped onion, green chilli, coriander leafs, curd, chaat masala and imli chutney. 	600	4
7	<i>Peanut sabji</i>	<ul style="list-style-type: none"> • Peanut- 85gm • Fenugreek seed*-15gm • Onion- 150gm • Tomato- 65gm • Green chilli- 2pc • Vegetable spices- 1tsp • Coriander leafs- few • Cumin seeds- 1tsp • Ginger grated- 1tsp 	<ul style="list-style-type: none"> • Boiled the peanut for 20-25 minutes. • In the grinder added 20gm peanut green chilli and made a smooth paste and kept in a bowl. • Again in the grinder added onion, ginger and made a smooth paste and kept in another bowl. • Take oil in a kadhai, heated it. • Cooked cumin seeds until it crackles. • Cooked chopped onion till they golden brown. Added onion, ginger paste and cooked for 2-3 minutes. • Added peanut paste and cooked for 2minutes. • Added boiled peanut and cooked for 2 minutes. • Added small amount of water for thick consistency and cooked for 5 minutes. 	350	3

		<ul style="list-style-type: none"> • Turmeric- ½ tsp • Vegetable oil-2 tsp • Salt- to taste 	<ul style="list-style-type: none"> • Off the flame. • Garnished with coriander leafs. 		
8	<i>Ground nut laddoo</i>	<ul style="list-style-type: none"> • Groundnut- 52.5 gm • White sesame- 10gm • Fenugreek seed*- 7.5gm • Coconut-5gm • Cashewnuts-5gm • Almonds- 5 gm • Raisins- 5 gm • Sugar- 10 gm • Cardamom-2 gm • Milk-10ml 	<ul style="list-style-type: none"> • Grinded all the ingredients except milk separately. • Mixed all the ingredients except milk simultaneously. • Made small balls with the help of milk by adding in mixture in small amount simultaneously. 	195	3
9	<i>Peanut chat</i>	<ul style="list-style-type: none"> • Peanut-85 gm • Fenugreek seed*- 15gm • Lemon-1pc • Chaat masala-2 tsp • Green chilli-2pc • Onion-1pc • Tomato (small)- 1pc • Coriander leafs- few • Salt-to taste 	<ul style="list-style-type: none"> • Sprouted the fenugreek seeds. • Boiled the peanut until soft. • Finelly chopped onion, tomato, green chilli. • Mixed all the ingredients simultaneously. • Garnished with coriander leafs. 	200	4

*In all those products supplementation of fenugreek seeds up to 0, 5, 10, 15 and 20 per cent was done.