

NUTRITIOUS LEGUME

SOYBEAN



Department of Foods & Nutrition
College of Home Science
Marathwada Agricultural University



PARBHANI

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SOYBEAN has become the predominant source of protein and gained importance in human nutrition all over the world within a period of four decades. Soybean is the only food that has become the leading source not only for protein but also for edible oils and fats. The production of soybean in the world has, therefore, increased by 54 per cent from 1976 to 1984.

Soybeans are the inexpensive legumes having high nutritional quality. They contain about 40-43 per cent of proteins, 20 per cent of fat and 20-21 per cent of carbohydrates (Gopalan *et al.*, 1971). The proteins of soybeans are comparable to those of animal foods except for methionine content. Hence, it is appropriate to refer them as "vegetarian meat". To combat general food scarcity particularly for proteins and oils, and because of beneficial effect of soybean crop in soil fertility, attempts have been made to develop suitable varieties of soybean by establishing All India coordinated projects for research on soybean by ICAR in India. This has resulted in increased production of soybean by increasing the acreage of cultivation in more than one million hectares giving way for establishing several soybean based industries.

The climatic conditions and the soil of Marathwada are found to be suitable for the cultivation of soybean. The All India coordinated project on soybean in Marathwada Agricultural University has developed several varieties of soybean, suitable for cultivation in this region of Maharashtra State.

Research studies conducted by the department of Foods and Nutrition revealed that the intake of protein and energy is inadequate in the diets of population leading to wide prevalence of protein-energy malnutrition among different segments of popu-

lation of urban and rural areas of Marathwada region (Arya, 1983; Bakshi, 1987; Ardhapurkar, 1990; Dudde, 1990; Joshi, 1991). In order to combat effectively protein-energy malnutrition, the intake of soybean needs to be advocated and popularized. Use of soybean at household level has not gained much popularity because of its beany flavour and prolonged cooking period. Therefore, attempts have been made to popularize the acceptance of soybean in different recipes. Incorporation of soybean JS-2 at a level of 30 to 50 per cent in different recipes of dhal is reported to be highly acceptable (Gangji, 1982). Incorporation of soybean in chapati and Bhakari is also highly acceptable (Harode *et al.*, 1990).

In order to enhance the popularity of soybean utilization for human Consumption, several sweet and savoury dishes are tried by incorporating soybeans at varying levels in the department of Foods and Nutrition. Some of the recipes of foods which are highly acceptable after incorporating soybean are given below.

1. SOYANE

Ingredients

Soybean	250.
Water	500 ml.
Salt	10 g.
Yellow colour	a pinch

Method

Clean soybean.

Soak soybean in hot water (80°C) for 15 minutes.

Dry the soaked soybean in shade.

Roast with sand and sieve.

Add colour and salt by dissolving in little water.

Mix well. Store in air tight containers.

2. SOYA KHARI

Ingredients

Soyabean	50 g.
Coriander seed powder	1 tsp.
Cumin seed powder	1 tsp.
Chilli powder	1 tsp.
Turmeric powder	$\frac{1}{4}$ tsp.
Coriander leaves	10 g.
Curry leaves	10 g.
Salt	to taste
Oil	for frying

Method

Soak soybean in hot water for 12 hours.

Remove the husk and wash thoroughly.

Fry them in oil till golden yellow in colour.

When hot sprinkle turmeric, chilli powder, salt, citric acid, cumin seed and coriander seed powder.

Mix well.

Decorate with fried coriander leaves and curry leaves.

3. SOYA PULVA

Ingredients

Soyabean	50 g.
Rice	50 g.
Oil	2-3 tsp.
Coriander seed powder	1 tsp.
Green chillies	$\frac{1}{4}$ tsp.
Lime juice	1 tsp.
Turmeric powder	a pinch
Salt	to taste

Method

Soak soybean in water for 15 hours.

Remove husk and wash well.

Cook rice and soyabean separately.

Mix the cooked rice with salt, turmeric powder and coriander seed powder.

Season the cooked soyabean with cumin seeds and green chillies.

Mix the rice with seasoned soybean and keep for few minutes.

Remove from fire.

Add lime juice and mix well.

Decorate with coriander leaves and serve hot.

4. SOYA VADA

Ingredients

Soybean	50 g.
Bengal gram dhal	50 g.
Green chillies	5
Ginger	Small piece
Coriander and curry leaves	a few
Lime	$\frac{1}{2}$
Garlic	6 flakes
Salt	to taste
Oil	for frying

Method

Soak soybean for 12 hrs and dehusk.

Soak bengal gram dhal for 4 to 5 hours.

Grind the soaked bengal gram dhal and dehusked soybean into a fine paste with little water.

Grind together green chillies, ginger, garlic, curry leaves and coriander leaves.

Add the above ground mixture and salt to the ground dhal.

Mix well.

Make vada of desired size and fry till golden brown in colour.

Serve hot.

5. SOYA CHAKRI

Ingredients

Soybean flour	50 g.
Bengal gram dhal flour	25 g.
Jowar flour	15 g.
Green chillies	3
Garlic	6 flakes
Sesamum seeds	50 g.
Turmeric powder	a pinch
Coriander leaves	15 g.
Coriander seed and cumin seed powder	1 tsp.
Salt	to taste
Oil	for frying

Method

Mix soybean flour, bengal gram dhal flour and jowar flour.
Add well pounded green chillies, garlic, coriander and cumin seed powder, turmeric, salt and coriander leaves to the flour.
Mix well and make a soft dough with water.
Knead well press through chakli maker and fry in hot oil till golden yellow in colour.

6. SOVADYA

Ingredients

Soy flour	50 g.
Bengal gram dhal	50 g.
Green chillies	2
Garlic	4 flakes
Turmeric Powder	a pinch
Grated dry coconut	2 tsp
Chopped coriander leaves	25 g.
Poppy seeds	1 tsp

Oil	2 tsp
Mustard seeds and cumin seeds	$\frac{1}{4}$ tsp
Butter milk	for sourness
Salt	to taste

Method

Sift soy and bengal gram dhal flours.

Add salt and turmeric powder.

Mix well.

Heat oil and season with mustard seeds, cumin seeds and ground mix of green chillies and garlic.

Add butter milk and water and boil. Add mixture of flour to to boiled butter milk, little by little string continuously.

Cook the mixture till it leaves the sides of the pan.

Spread the cooked mixture on the greased plate.

Decorate the mix with chopped coriander leaves, grated coconut and poppy seeds. Cut into cubes.

7 SOYA LADU

Ingredients

Soybean	100 g.
Roasted groundnuts	50 g.
Roasted wheat flour	100 g.
Roasted sesamum	25 g.
Jaggery	120 g.

Method

Roast the soybean till light brown in colour.

Dehusk and grind to a fine powder.

Powder the roasted groundnut and sesamum.

Pound jaggery well.

Mix all the ingredients well with little amount of warm water. Form into even shape balls with the hands.

8 SOYAFI

Ingredients :

Soybean	75 g
Bengal gram dhal flour	25 g
Ghee	40 g
Sugar	75 g
Cardamom	3

Method

Roast soybean till light brown in colour.

Dehusk the soybean, grind into fine powder and sieve.

Roast the flour with 20 g. of ghee.

Follow the same procedure for bengal gram dhal flour.

Prepare sugar syrup of soft ball stage. Mix the soybean and bengal gram dhal flours with sugar syrup and cook the mixture till it leaves the sides of the pan.

Add cardamom powder and permitted colour.

Spread the mixture immediately on greased plate. Cut into cubes when cooled.

9 SOYAL

Ingredients :

Soybean	50 g
Green chillies	3
Groundnut	13 g
Coriander seeds and cumin seeds powder	1 tsp.
Turmeric powder	a pinch
Mustard seeds	1/4 tsp

Onion	$\frac{1}{2}$
Coriander leaves	a few strings
Oil	2 tsp.
Salt	to taste

Method

Soak soybean for 24 hours in hot water.

Dehusk and wash thoroughly.

Cook in enough water for 30 to 40 minutes.

Heat oil and season with cut green chilli, onion, turmeric powder, mustard seeds coriander seed and cumin seed powder.

Add cooked soybean, mix well, and keep on fire for some time.

Remove from fire.

Add lime juice and coriander leaves serve hot.

10 SOY BOONDHI

Ingredients :

Soybean flour	100 g.
Bengal gram dhal flour	100 g.
Sugar	200 g.
Cashewnuts	20 g.
Raisins	10 g.
Cardamom	3
Soda	a pinch
Ghee	for frying

Method

Sift soy flour and bengal gram dhal flour.

Rub the flour mixture with little ghee and soda bicarb.

Make a thick batter with flour and water.

Heat fat in a deep frying pan.

Drop batter through Jhara of boondhi Fry till golden yellow in colour.

Prepare sugar syrup of two string consistency.

Put in fried boondhi into syrup.

Add crushed cashewnut, raisins and cardamom.

Department of Foods and Nutrition has also carried out research on the nutritional quality of soybean varieties developed at Marathwada Agricultural University, Parbhani. Boralkar and Reddy (1985) have evaluated the nutritional quality of JS-2 variety of soybean and the results are reported in Table 1.

Table 1. Effect of varying periods of roasting, germination and fermentation on the in vitro digestibility of proteins of JS-2 soybean

Sr. No.	Type of soybean	In vitro protein digestibility (%)
1	Raw soybean	58 . 2 ± 0 .07
2	5 Min. roasted soybean	61 . 6 ± 0 .13
3	10 Min. roasted soybean	61 . 6 ± 0 .08
	CD 0.5/0.01	0 . 12 / 0 .57
4	0 hrs germinated/fermented soybean (12 hrs. Soaked)	67 . 9 ± 0.05
5	24 hrs germinated soybean	80 . 3 ± 0.20
6	36 hrs. germinated soybean	86 . 4 ± 0.12
7	48 hrs. germinated soybean	92 . 5 ± 0.14
	CD. 005/ 0.01	0.18/0.24
8	8-hrs. fermented soybean	80.1 ± 0.11
9	12 hrs. fermented soybean	84. 4 ± 0.08
10	16 hrs. fermented soybean	86. 4 ± 0.08
	CD 005/ 0.01	0.10/ 0.14

Table 2. Proximate composition of different varieties of soybean (Dehulled seeds)

Soybean variety	Moisture %	Fat %	Ash %	Crude % fibre	Carbo- % hydrate	Protein %	Calcium (mg/100g)	Iron (mg/100g)
JS-81-608	7.53	21.30	5.13	2.80	16.94	46.77	227.12	11.80
JS-81-303	8.33	18.73	4.70	3.30	20.04	45.61	130.26	12.20
JS-79-277	5.29	17.65	4.00	3.00	34.88	35.20	100.23	10.30
SH-84-14	9.64	21.86	3.90	3.00	16.32	46.77	113.67	12.83
Mean	7.69	19.88	4.43	3.15	22.04	43.51	142.82	11.66