

A Project Report On Soy Traditional Foods

INTRODUCTION TO SOY PAPAD

Among several indigenous traditional savoury preparations of India, *papad* constitutes an important food adjunct. Black gram (*Phavelous Mungo*) forms in principal constituent of the more popular varieties of *papads*. The present investigation was undertaken to reduce the cost of production along with nutritional improvement and to add more variety to the diet. To arrive at the desirable blend for preparing *papads* of acceptable quality attributes and at the same time to achieve maximum substitution of black gram by Soybean, 100:0, 80:20, 60:40, 40:60, 20:80 and 0:100 blends of black gram and soybean flours respectively were tried using normal recipes. The diametrical expansion of *papads* based on only soybean was maximum i.e., 66% where as *papads* prepared exclusively with black gram showed poor diametrical expansion on frying i.e., 41%. The normal water addition of 45 per cent was increased as the percentage of incorporation of soybean increased to get a *papad* dough of desired consistency for easy and smooth rolling of *papads*. Though the plasticity of the dough decreased as the proportion of soybean increased, the elasticity and cohesiveness of the dough was maintained at the desired level. All the *papads* on frying had bright cream to golden yellow colour and attractive appearance



They were crisp to bite and had a balanced acceptable flavour. The *papads* of 60:40 blend of black gram and soybean was found to be highly acceptable. Soybean could completely replace black gram flour in the preparation of *papads* without adversely affecting the handling properties of the dough as well as the quality attributes of *papad*. Desirable levels of spices in *papad* recipes have also been worked out.

Keywords: *Papads*, black gram, soybean, blending *papads*, *papad* khar, spiced *papads*, diametrical expansion on frying.

Several indigenous traditional savoury preparations are being manufactured and extensively consumed in India Among these *papad* constitutes an important food adjunct (Kulkarni et al. 1996). It is essentially a thin wafer like product, usually circular in shape, rolled from a dough made out of pulses and / or farinaceous materials with added salts and spices, *papad* is also known as *Happala* or *appalam* in South India, it has a higher moisture content and puffs on frying. *Papad* is consumed in toasted or fried form.

In recent years, it is gaining recognition as India's unique international menu. For centuries, *papads*, like pickles are consumed through out the country by large sections of the, population. They are served in hotels and restaurants with lunch and / or dinner. They are also popular with the defense forces (Shurpalekar et al., 1972).



Formerly, *papad* making was a house hold occupation of women folk now a days it has taken up as a cottage/small scale industry. There are no systematic data available on production of *papads* in available. There has been a growing demand of this important class of savoury product in India and abroad.

Many varieties of *papads* are available in the market viz., spiced or plain *papads*, pulse based, rice based, blends of pulses with cereals etc. The techniques in use, for the preparation of *papads* permit the enrichment of the product with the proteins, amino acids, mineral salts and flavouring materials. Black gram or *Urd* (*Phaseolus mango*) is the principal constituent of the more popular varieties or commercial *papads* followed by green gram or mung (*Phaseous aureus*).

Primary importance of soybean (*Glycine max*) as a source of dietary protein has been emphasized because of its presence in high amounts as high as 40% and its quality, (essential amino acid profile), which is far superior to that in other legumes and oilseeds. It also contains 23% carbohydrates, 20% oil and reasonable amounts of minerals and vitamins.

Even though the production as well as processing of soybean have assumed a place of pride in national perspective, India is lagging far behind the world in terms of total production, yield/ha, processing as well as per capita consumption (Gandhi, 1997)

Earlier effort to promote soybean in India has been essentially to substitute/supplement the legumes in the diet. Today soybean is the focus of the latest and most stimulating research in phytochemicals, and thus to improve the health status of the human beings along with adding variety to the diet. Low priced and highly nutritious soya-based food or products are gaining consumer acceptance and the demand for these products is increasing.

Extensive work on proximate composition, packing, storage and quality control of papads in India has been reported (Shurapalekar et al. 1970; Pruthi et al 1984; Manan et al 1988; Kulkarni et al. 1996). No systematic work has, however, been reported so far on papads based on blends of black gram with soybean. The present communication deals with blending commonly used pulse, black gram with soybean in spiced papads in order to enhance the nutritive value, reduce cost and to add variety to the diet. The results of such a study are reported in this paper.

Materials and Methods:

Black gram flour: Good quality black gram dhal (split pulse free from husk) purchased locally were ground in to fine flour to pass through 85 mesh.

Soybean flour: Soybean purchased from the local market were cleaned and soaked in cold water for 24 hour. Then allowed it) germinate for 48 hours Soya sprouts were blanched for 30 minutes followed by over drying up to 6 - 8% moisture content in order to remove the anti nutritional factors present in the soybean. Thus processed soybeans were milled in to fine flour to pass through 85 mesh.

To arrive at the desirable blend for preparing papads of acceptable quality attributes and at the same time to achieve maximum substitution of black gram by soybean, 100:0, 80:20, 60:40, 40:60, 20:80 and 0:100 blends of black gram and soybean flours respectively were tried using normal recipes (Saxena et al., 1989).

Common salt: White, crystalline, powdered common salt available locally was used.

Alkaline additive: Locally available papad khar procured from local market was used as alkaline additive.

Spacing of papads: Locally purchased chilli, black pepper and jeera (free from stalks) were cleaned and ground in to fine powder to pass through 85 mesh. Ready but moderate degree of perceptibility of popular spices in fried papads was taken as the main criterion to arrive at desirable levels after several trials. In the preparation of papads spices like chilli powder, black pepper powder and jeera powder were dry mixed with the main ingredients. Asafetida powder was added in the form of a water suspension before kneading all the ingredients in to a papad dough.

Preparation of papad: A popular commercial recipe adopted, consisted of 100 parts of black gram flour, 45 parts of water, 8 parts of common salt and 1 part of 2:1 sodium carbonate - bicarbonate mixture - corresponding to carbonates present in 2 parts of a local sample of papad khar.

Weighed quantity of flour was taken in a mixer. A dispersion of common salt and carbonates in requisite quality of water was added and the contents were kneaded at minimum speed for 2-3 minutes to get a homogeneous lump of the dough. After resting the dough for about 30 minutes it was divided in to balls of about 2cm diameter each weighing about 5 - 6 grams. These balls were rolled in to thin circular discs of about 1 mm thickness using a wooden rolling pin. Corn starch was used as dusting material to prevent stickiness during rolling. The papads were cut to uniform circular disc and any adhering starch was brushed off They were dried to 14-15 per cent moisture content under shade and stored in air-tight plastic containers.

Dough characteristics and papad quality: The handful and rolling property of the dough and appearance texture, taste and diametrical expansion of fried papads were considered as main criteria for evaluation.

Effect of storage on expansion characteristics: The diametrical expansion of papads based on different blends of black gram and soybean stored for varying periods in air tight plastic container were studied over a period of three months. The mean increase in diameter after frying was calculated for 5 samples in each blend. Based on a maximum score of 20, given to an arbitrarily fixed 60 per cent increase in diameter, scores for different samples were calculated.

Organoleptic evaluation: Dried papads were deep-fat-fried in refined ground nut oil at 195 + 5°C for 5 - 10 seconds (till sizzling subsided) to facilitate optimum frying. The quality of raw, as well as fried papads was assessed by 10 semi-trained panelists for appearance, colour, taste and overall acceptability using a 9 point Hedonic Scale (Govindarajan et al. 1971).

Results and Discussion:

Dough characteristics and papad quality (Table-1): The diametrical expansion of papads based only on, soybean was 66 per cent, whereas papads prepared exclusively with black gram showed poor diametrical expansion on frying i.e., 41% when compared to other samples. The normal water addition of 45 per cent was increased as the percentage of incorporation of soybean increased to get papad dough of desired consistency for easy and smooth rolling of papads. Though all the doughs were soft to hand, the plasticity of the dough, decreased as the proportion of soybean increased to a very little extent. The elasticity and cohesiveness of the dough was maintained at the desired level, were easy to roll and do not require additional dusting material while rolling. Unlike papads other than black gram, the edges of the rolled papads blended with soybean did not show cracked appearance.

All the papads on frying had bright cream yellow colour and attractive appearance. They were crisp to bite and had a well balanced highly acceptable taste. Typical and predominant beany flavour was not observed even in the case of 100 per cent soybean papads, processing of soybean for removal of anti-nutritional factors in the beginning of the study may be the causative factor for the same. The papads of 60:40 blend of black gram and soybean was found to be highly acceptable by the panel followed by 40:60 blend. Therefore, it can be concluded that, soybean could completely replace black gram flour in the preparation of papads without adversely affecting the handling properties of the dough as well as the quality attributes of papad.

Spicing of Papads: From the various trials carried out using different levels of spices the desirable levels of incorporation of spices on the basis of 100 g flour arrived at were, Chilli powder, 1:0, jeera powder, 2; black pepper powder 4, asafetida powder, 0.2 - 0.3 percent. These levels were the ones at which the taste and the flavour of the spices used in combination were just perceptible. Various combinations of these spices can be worked out to meet the requirements of the consumer. Spices did not have any deleterious or beneficial effects on the diametrical expansion, which ranged between 40 and 52 per cent (Shurpalkar and Venkatesh, 1975).



In earlier studies (Shurpalekar et al., 1970), falling off of pepper specks in particular, leaving holes on the papad was found to be one of the serious defects. The present studies have overcome this defect by increasing the desirable thickness of spiced papads to about 1 mm and using powders of pepper and jeera, passed through 85 mesh. Further, use of spices in powdered form resulted in papads of better appearance with uniform distribution of spices. Jeera used in the form of powder gave the papads a characteristic taste of the active

principle. It may be noted here that the use of each spices has been maintained at mild to moderate levels.

Effect of storage on diametrical expansion of papads: It is Interesting to observe that in all the soybean papads the diametrical expansion showed as increasing trend during storage (Table-2) In case of papads based on different blends, the diametrical expansion increased from initial values of 22 - 50 per cent to 42 - 68 percent during this period. This may perhaps be explained by more complete interaction between the additives and tile flour components during storage which is somewhat comparable to improvement in quality as a result of aging in some of the food products (Shurpalekar and Venkatesh, 1975).

Quality assessment:

Colour - The data in Table - 3 indicate that the colour of the samples is acceptable both before and after frying. It was observed that the creamy yellow colour of black gram papad gradually changed markedly to an acceptable bright golden yellow on frying.

Size, shape and thickness: All the samples have scored more than 75 per cent of the maximum for these parameters, uniformity was maintained in size, shape and thickness irrespective of level of blending black gram with soybean.

Spicing: As the spices used for spicing of papads were in the finely powdered form and thickness of papad was maintained about 1 mm, all the samples were assessed as good with respect to uniformity of size, shape and distribution of specks/ particles of spices used.

Blister formation: All the samples were rated good or excellent in view of fine and uniform blister development on frying.

Pliability: All the samples had excellent pliability. As moisture content influences the pliability to a certain degree, suitable package used in the study i.e., packed in polythene covers and stored in air tight containers was able to maintain the initial moisture content of dried papads around 13 - 14 % thus preventing loss or gain of moisture which intern has the influence on pliability of papads

Texture: The texture of all the samples was assessed as either good or satisfactory. Only one sample i.e papad based on blend of black gram soybean in 60 -40 proportion was rated excellent

Taste: All the samples were graded as good or excellent having well balanced and highly acceptable taste and flavour. Of the 6 samples 3rd sample was found to be highly acceptable by the panel followed by 4th sample.

Expansion on frying: As the level of incorporation of soybean increased, the increase in the diametrical expansion of papad on frying was observed. All the samples were graded as excellent by the panel.

Overall score: Based on an overall score of 100 consisting of 40 for appearance and 20 each

for texture, taste and diametrical expansion on frying, none of the samples could be assessed as poor. The papad based on blend of black gram with soybean in 60-40 ratio was graded as excellent followed by the papad blend of 40:60 ratio. Blending of black gram papad with soybean at all the levels was acceptable. Papad prepared exclusively on soybean flour was equally good and acceptable highly appreciated by the panel for novel characteristic flavour.

It may be concluded from the present studies that the papads of 60:40 blend of black gram and soybean respectively was found to be excellent and highly acceptable followed by 40- 60 blend. Soybean could completely replace black gram flour in preparation of papads without adversely affecting the handling properties of the dough as well as quality attributes of papad. The desirable levels of incorporation of spices on the basis of 100 g flour arrived at were - Chilli powder, 1.0, jeera powder, 2; black pepper powder, 4, asafetida powder, 0.2 - 0.3 per cent. AT this level, the taste and flavour of papads were just perceptible.

INTRODUCTION TO SOY NOODLES

Noodle products made from the combined flours of rice and soybean (Rice-Soy Noodles) offer indigenous alternatives to wheat noodle products. A high protein soup based was also developed by the Institute from mung beans.

Rice-Soy Noodles is made from a combination of rice and full-fat soy flours with the addition of salt, cornstarch and water. Blended mixture is formed into balls cooked in boiling water, air-dried, passed through a noodle machine to make noodle strands, then dried. Contains 13.8 g protein, 1.4 g fat, 360 Kcal, 180 mg calcium, 114 mg phosphorus and 3.3 mg iron per 100 grams.



Nutritional Information (per Serve)	
Carbohydrate	56g
Energy (cal)	427cal
Energy (kj)	1790kj
Fat	9.8g
Protein	29.8g
Sodium	855mg
Sugars	19.3g