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# PROCESSING AND ACCEPTABILITY APPRASIAL OF DEVELOPED SOY CURD

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## ABSTACT

There is increasing demand of soybean *(Glycine max)* due to its unique composition, excellent nutritional value and health benefits. Therefore, the study was conducted to develop tofu from soybean. Nutritional analysis of tofu stated that protein content 43.31, fat (12.80gm per cent) calcium (132.38mg per cent) the acceptability of tofu and amul paneer were evaluated by using composite scoring technique with five point rating scale. The evaluation was done in raw forms of amul paneer and tofu,sandesh from amul paneer and tofu and pakora from amul paneer and tofu. Over all acceptability score indicated that amul paneer was percent while tofu 56 percent more acceptable in females than the males where amul paneer was 59.3percent and tofu 33.3percent. Acceptability was 80.8 and 54.5 per cent found in sandesh of amul paneer and sandesh of tofu which was higher respectively in male. The highest per cent of overall acceptability was seen in pakora of amul paneeri.e. 83.6 percent than pakora of tofu 72per cent in females. Estimation of total cost of tofu showed that amul paneer has Rs. 100 for per kg, which was higher as compared to tofu Rs. 31.2 per kg.

Soybean should be considered not primarily as a meat substitute, but rather as food ranking with meat, eggs, milk and cheese, in protein content and supplementing these foods in the diet.

**(1)**

## INTRODUCTION

Among all beans available soyabean *(Glycine max*) is most widely produced leguminous crop in the world. Soyabean is a useful pulse and oilseed.The earliest known name for the soyabean was SHU, a term used in North eastern China as early as the 11$^{th}$ century B.C. From China, soyabean went to Europe in 1792 and to the United States in 1804. In the US, more than 1000 types of soyabean are grown essentially as an oil-seed crop and the country stands first in the world, both in the area under cultivation and production. Soyabeans were introduced into several countries such as Japan, Indonesia, Philippines, Vietnam, Thailand, Malaysia, Burma, Nepal & India.

India is the fifth largest producer of soyabean (Figure-1). Soybean cultivation in India started long ago but its successful cultivation was increased over last two decade (SOPA Report, 2003).

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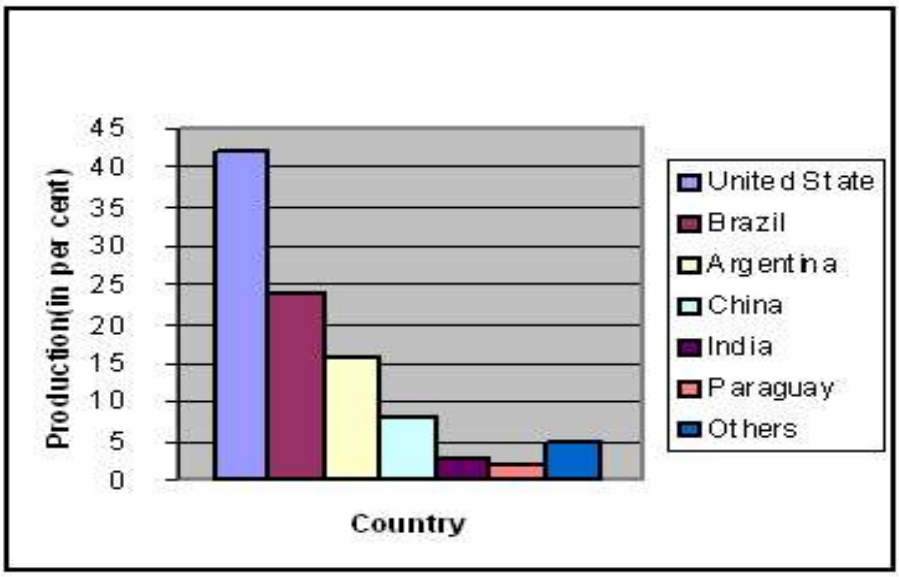


**Figure-1: World soyabean production**

Soyabean belongs to the family Leguminous and genus Glycine, L. The cultivated form, named Glycine max (L.) Merril, grow annually. Its plant may reach 1.25m of height and have spare or dense branches, depending on cultivars and growing conditions.

Soyabean seed is not having endosperm, it consists seed coat and large, well-developed embryo.

The embryo has three other parts: - radicle, hypocotyls and epicotyl. The radicle and hypocotyls, in combination is knows as embryonic axis (or germ), which is situated under the seed coat at end of the hilum, just below the micropyle. The third part, the epicotyl, is too small and seated among the pair of cotyledons. In germination, the radical is primary root, while the hypocotyl lifts the cotyledons above the soil surface. The epicotyl is the main part of stem which helps in growing the plant.

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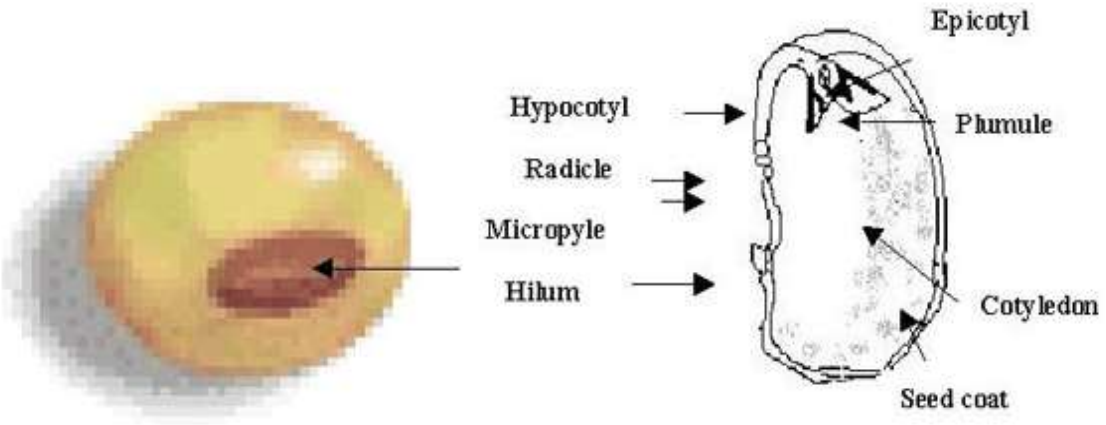


**Figure 2. Structure of a soybean seed**

## Nutritional Profile -

It is richest source of protein among all pulses and legumes. The soyabean is rich in nutritive value of all plant foods served in the world (Kure et al,.1998).

It is used in many forms. It is also rich in calcium, iron, phosphrus and vitamins. It is the only source that contains all the amino acids (Asif and Acharya, 2013).

## Table-1:Proximate principles per 100 gm of Soyabean

| **Nutrients** | **Amount** |
|---|---|
| Moisture | 8.1 gm |
| Protein | 43.2 gm |
| Fat | 19.5 gm |
| Fiber | 3.7 gm |
| Mineral | 4.6 gm |
| Carbohydrate | 20.9 gm |
| Energy | 432 kcal |
| Calcium | 240 mg |
| Iron | 10.4 mg |

***Source: By ICMR (as given in Gopalan et at., Nutritive value of Indian Foods, NIN (2002)***

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## Methodology -

Soyabean is considered to have a beany flavour. This beany flavour is not accustomed to people who are habituated field bean flavours. Digestibility problem has been noticed because of trypsin inhibitors present and certain unavailable carbohydrate and high protein content. Some toxicant factors, saponin and haemagglutinins also cause digestive trouble and deleterious effects on health when unsoaked and uncooked soyabean are eaten. These problems are existing in all dhals, pulses and grains but in smaller quantities and it is only the required pretreatments and constant use for which people are not accustomed in case of soyabean. Since soyabean has more of these problems than others, precaution is required when it has to be adopted in the daily diet.

The commonly used processing methods for soyabean are as follows:

### (a.) Soaking -

Soaked soyabean can be used without any other dhal. These are suitable for any vegetable curry, sagu, bassaru, massoppu, playa preparation.

### (b.) Boiling -

Boiled soyabeans are suitable to mix in children food, especially in weaning foods, and also in baked food.

### (c.) Germinating -

Germinated soyabeans can be used for dhal preparation and weaning foods.

### (d.) Roasting -

Roast soyabean are suitable in curry preparation.

### (e.) Fermentation -

Fermented soyabeans are used for preparing tempeh.

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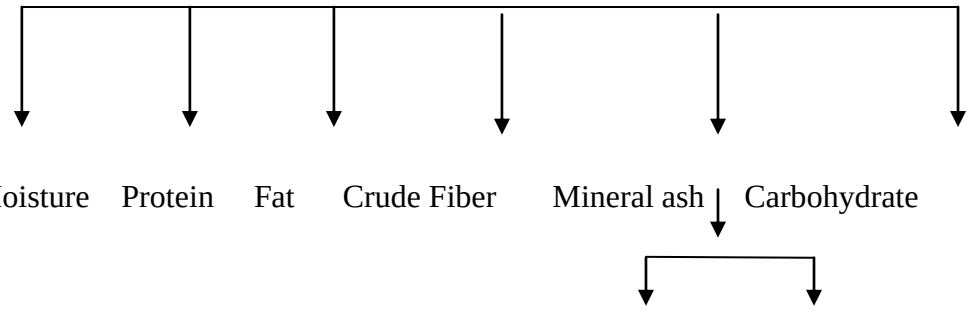
## ➢ Development of soy curd from Soyabean

1. **Soyabean Selection:**Good quality, intact, whole, free from infestation, clean and unbroken soyabean were selected for soy curd preparation.
2. **Soaking:** Soyabean was soaked overnight in water to soften it.
3. **Blanching:** Soaked soyabean was drained off from water and was blanched. For blanching water was boiled upto 100°C soyabean was put to boiling water for 2-5 minutes and was immediately immersed in cold water.
4. **Grinding:** Extra water was drained from soyabean by pressing it between palms and was ground to make paste.
5. **Boiled:**The paste was prepared by adding six times water to it for 15-17 minutes and remove from the flame to cool.
6. **Extraction of milk:**Soya milk was then filtered using musln cloth twice and dairy milk was added in the ratio 1;1 by mixing both milk it was again simmered making sure that temperature is maintained below 100°C.
7. **Addition of culture:**Culture was added to thicken and prepare soy curd.

## Proximate analysis of soyabean genotypes




## 1. Estimation of moisture content:

The moisture content was estimated by air oven dry method. The moisture content of food is a measure of the stability weight and quality of food (AOAC, 2000).

## 2. Analysis of protein content:

The protein content was analyzed by Microkjeldhal method. The method basically measure the nitrogen content of the given sample, the estimated value being index of protein content of the sample provided the estimated nitrogen is entirely derived from protein. On an average, protein contain 16% nitrogen by weight, the nitrogen content of a sample is multiplied by a factor 6.25 (100/16) to obtain its protein content. The method is widely used in estimating the protein content of a wide variety of samples ranging from food materials and agriculture products to biological fluid like blood serum and urine. Even non-protein nitrogen if present in sizable quantity in a sample can be measured after the precipitation of protein (AOAC, 2000).

## 3. Assessment of fat content:

Fat content of the sample was assessed using Soxhlet method (AOAC, 2000).

## 4. Estimation of Fiber Content:

Residue of feed that is insoluble after successive boiling with dilute acid and alkali refers to crude fibre. The method was originally proposed at the weende experiment station. Hence this method on determination of crude fiber is known as weende's method of determination of crude fiber (AOAC, 2000).

## 5. Estimation of Ash content: -

Mineral content was estimated by ashing the samples in muffle furnace (AOAC, 2000).

## 6. Assessment of Carbohydrate content:

## Method: -

Subtract from 100, a sum of values (gm/100gm) for protein, moisture, fat, crude fiber and mineral ash; was determined the carbohydrate content (gm/100gm) of sample (NIN, 2003).

## 7. Determination of Calcium content:

Determination of calcium was done by Volumetric Titration method.

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## 8. **Estimation of Iron Content:**

Iron content of the samples was estimated through spectrophotometric technique.

**Results:**Results indicate that Moisture content was 5.95 gm with 43.31 gm of protein, calcium was found to be 132.38 mg which is greater to milk.

| **Nutrients** | **Tofu** |
|---|---|
| **Moisture** | 5.95gm |
| **Protein** | 43.31gm |
| **Fat** | 12.80gm |
| **Fiber** | - |
| **Ash** | 2.30gm |
| **Carbohydrate** | 35.64gm |
| **Calcium** | 132.38mg |
| **Iron** | 1.96mg |

Soy curd 1; 1 ratio was found more acceptable and the mean score based on sensory evaluation was accepted in taste, appearance, texture, colour and overall acceptability only one attribute was not acceptable i.e. flavor which need more research to improve the flavor.

Hence it can be concluded that soy curd in acceptable in all attributes except flavor and 1:1 ratio of soy and dairy was acceptable by the panelists.

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