MINISTRY OF FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

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PROCESSING OF SOYA CHAAP

AATMANIRBHAR BHARAT

PM Formalisation of Micro Food Processing Enterprises Scheme (PM FME Scheme)

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SOYBEAN CROP PHYSIOLOGY

Soybean looses viability very quickly.

It is a major pulse in hilly region.

Local variety is known as kalitur.

soyabean seed germination was 50% where as 30% in maize and 26% in rice.

Optimal conditions for germinations are found in early season after the first substancial rainfall.

Optimal temperature for germination of soyabean are 34-36 ºC with minima of 4 ºC and maxima in the range of 42-44 ºC

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- **SOYABEAN ORIGIN AND HISTORY**

Southeast Asian origin

• Named as Chinese pea or Manchurian beans
• Soya bean has been reported to be extensively cultivated in china from pre historic times

Delouche found that seeds took minimum period for germination at temperature 30 ° C while it took twice longer to attain the same percentage at 20 ° C.

Soyabean is a water spender with LWP falling to low level before stomata completely close.

The rate of seed fill is affected by photoperiod in soyabean.
Soyabean produce yields less than other cereals and potatoes.
A yield of 10-15 g/ha in 60-70 days is equivalent to a yield of 20-30 g/ha in 120 -140 days.

CLIMATIC REQUIREMENT

Soyabean distributed in areas around the world between 0° and 20° N in medium altitudes and 200 and 400 N in low altitude.

Soyabean is a kharif crop but grows in summer in hilly region.

It requires warm and moist climate

Temperature of 250 to 300 C is optimum for its growth. Maximum flower initiation occurs at day at temperature of 24-300 ° C. And complete inhibition takes place at 130 ° C.

STORAGE

- Soyabean seeds are sensitive to humidity and temperature in storage.
- Soyabean with higher moisture content of 13.5 % stored at 300 °C failed to germinate after 5 months.
- But full viability maintained even after 10 years when it is stored at 100 °C.
- Seeds under ordinary storage conditions do not retain viability for longer than one season.
- Seeds should be dried to moisture content down to 10 % before storage

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QUALITY

- Soyabean exists as black yellow and chocolate seeded type.

- In northern India black seeded type is cultivated which has higher percent of protein and lower percent of oil than yellow and chocolate ones

1 kg of soybean flour is equivalent in protein to 2kg of beef , 2.3 kg of mutton, 2.1 kg of fish,108 eggs and 18L of milk.

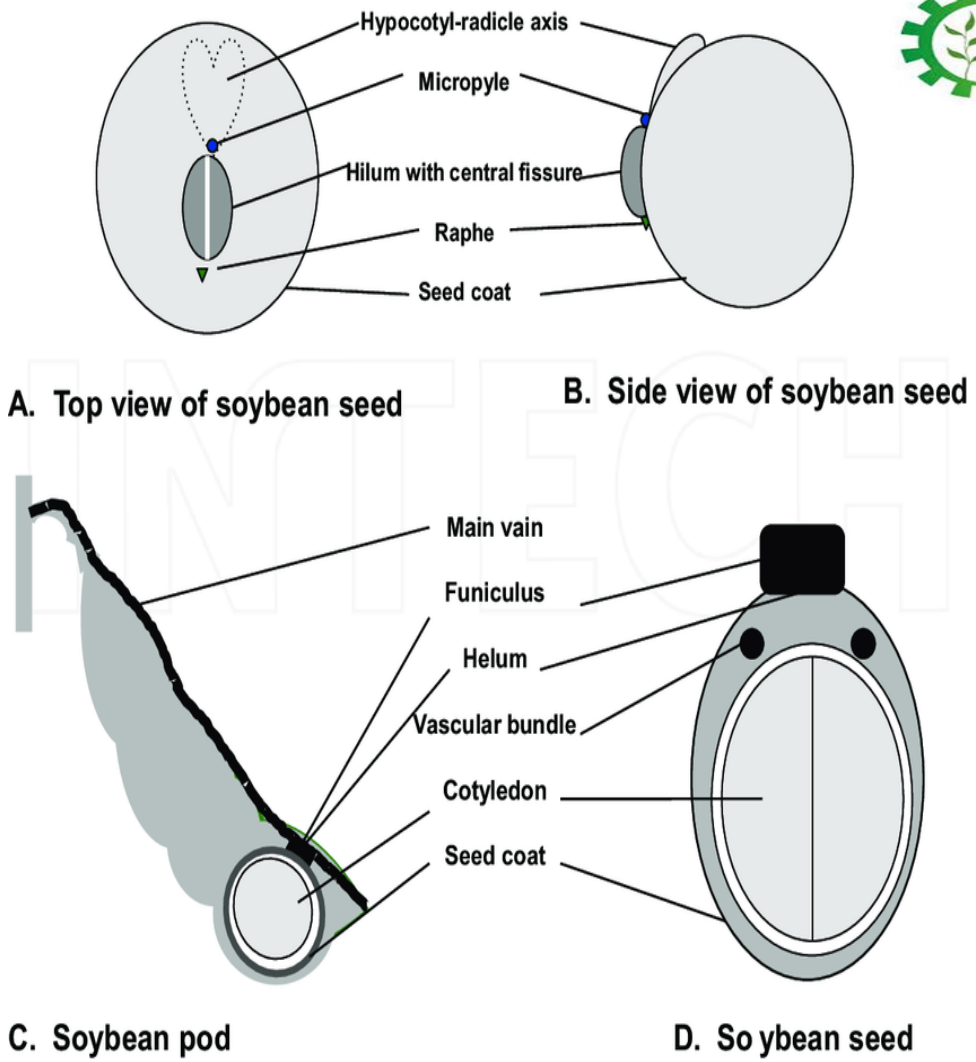
- Soyabean constitutes of 43.2 and 19.5% protein and fat respectively.

- Soybean is a legume crop principally containing protein ,lipids ,carbohydrates and minerals .

- Soybean has highest amount of protein among the cultivated legumes.

- Sobean usually contains 20-22% fat on dry weight of which 12-15% is saturated fatty acids comprises of palmatic and stearic acid.

- Indian soybean have accounted for 43.2 and 19.5% protein and fat respectively



Soybean Seed structure :
Fig. 2: Soybean Seed Structure

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PRODUCTION SCENARIO OF SOYABEAN

United States of America is stood first with 1195.18 lakh tonnes in 2017-18 followed by Brazil (1145.99 lakh tonnes), Argentina (549.71 lakh tonnes), China (131.52 lakh tonnes) and India (109.81 lakh tonnes).

Soyabean has become an important oilseed crop in India in a very short period with 113.98 lakh ha area under its cultivation during kharif 2019-20.

The major soyabean growing states are Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, and Telangana. According to the first advance estimates, Govt. of India, soyabean production is estimated at 135.05 lakh tonnes during kharif 2019-20.

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SOYA CHAAP INTRODUCTION

Soya chaap is a meat substitute available in various shapes and slices like that of sausages, tikkis, meat loafs etc.

The most classic form of soya chaap is the laced soya chaap over candy stick.

It is a high protein snack or Veg Meal soya chaap is a delicious vegan protein option.

Raw material for soya chaap production is soyabean

Table 1: Global Soyabean Supply and Demand (in million tonnes)

	2017/18 (Estimated)	2018/19 (Forecasted)	2019/20 (Projected)
Opening Stocks	47.80	44.30	54.70
Production	340.90	363.10	343.70
Imports	152.70	148.60	149.70
Total Availability	388.70	407.40	398.40
Food	19.10	19.20	20.20
Feed	14.50	14.60	13.70
Crush	302.20	308.80	314.50
Total Consumption	344.70	352.50	358.10
Exports	152.70	148.60	149.70
Ending Stocks	44.30	54.70	40.70

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State	2018-19		2019-20	
	Area (lakh ha)	% to total area	Area (lakh ha)	% to total area
Madhya Pradesh	53.18	47.02	55.16	48.39
Maharashtra	40.44	35.76	40.11	35.19
Rajasthan	10.46	9.25	10.60	9.30
Karnataka	3.39	3.00	3.30	2.90
Telangana	1.78	1.57	1.77	1.55
Others	3.84	3.40	3.04	2.67
All India	113.09	100.00	113.98	100.00

CLASSIFICATION OF SOYBEAN

There are 1200 to 1400 varieties of soybean

1.Yellow group: • Pai-mai- yellow seed with white white scar
• Chin huan –the round seed with yellow golden
• Hui chi-the yellow seed with dark brown

2.Black group : • The wu-tou the large black seed.
• Pein wu tou the flat black seed.
• The small black seed.

3.Green group: • The epidermis green but green yellow.
• Epidermis and germ both green.

JAPANESE CLASSIFICATION

According to shape, size, colour, period of maturity and the uses to which is to put.

Marten's classification: Marten in 1869 classified according to form or shape of seed.

- Soja elliptica or the oval seed
- Soja spelica or the round seed
- Soja compressa or the compressed seed

Aarz's classification: according to form of pods

- Soja platycarpe : flat podded soya bean
- Soja jumida : swollen podded soya bean

BOTANICAL DESCRIPTION

• Botanical name: *Glycine Max*, is a herbaceous annual plant in the family Leguminosae.

• Seeds can be variety of colours including yellow, green, blacks or a melted combination.

• Plants can grow up to 50-200 cm

• Taproot system , presence of root nodules.

• Self pollination , flowering starts from lower parts of stem.

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IMPORTANCE OF SOYBEAN IN INDIAN ECONOMY

Soybean contributes significantly to the Indian edible oil pool.

Presently soybean contributes 43 % to the total oilseeds and 25% to the total oil production in the country.

Currently, India ranks fourth in respect to production of soybean in the world.

The crop helps earn valuable foreign exchange (Rs. 62000 millions in 2012-13) by way of soya meal exports.

Soybean has largely been responsible in uplifting farmer's economic status in many pockets of the country.

Health Benefits Of Soybean

- Helps in improving metabolic activity
- Helps in healthy weight gain
- Helps in preventing cancer
- Helps to boost heart health
- Helps to relieve menopausal symptoms
- Helps to boost digestive health
- Helps in improving bone health
- Helps in preventing birth defects
- Helps in improving blood circulation
- Helps in controlling diabetes

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PROCESSING OF SOYA CHAAP

Ingredients

Soyabean

Water

Soya chunks

Maida, salt

Sticks

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SOYA CHAAP








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FLOW CHART SOYA CHAAP

Take soya bean in a bowl, add water to it.

↓

Soak it overnight and then grind to make a paste.

↓

Now take water in a bowl, add soya chunks to it and bring it to boil

↓

After the boil, drain out the water and soak it in cold water till they become soft

↓

After draining out all the water, grind the soya chunks to make it a paste.

↓

Take soya flour paste in a bowl and add soya chunk paste to it.

Mix Maida and salt to the bowl. Stir all of them thoroughly.

↓

Add some water and knead a dough.

↓

Flatten the dough like a chapatti and cut long pieces out of it.

↓

Roll the long pieces on to the sticks.

↓

Take a pan full of water and heat it, add the sticks and let it boil a little .

↓

Now drain the water and let it cool down.

↓

Soak the sticks in cold water for a few minutes and use

ANOTHER METHOD FOR MAKING SOYA CHAAP

Raw material : Soyabean flour , wheat bran , oil and refined wheat flour .

Mix the above ingredients and make dough out of it .

After allowing the dough to rest for a while , cut the dough and roll over the sticks.

After shaping , these chaps are boiled for 30 minutes .

Once this is done allow the boiled chaaps to cool buy soaking them in water for 10 to 15 minutes.

Finally the chaaps are frozen in blast freezer , packed in large packages and stored in cold chamber.

According to the market demand the chaaps are removed form the chamber , sorted , graded and packed in various quantities.

The supply of these soya chaaps in done through the cold chain .

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SOYA CHAAP MAKING MACHINE

Automation	Automatic
Grade	
Motor power	2 HP
Motor Type	Three Phase
Frequency	50/60 Hz
Voltage	220-440 V

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SOYA CHAAP MAKING MACHINE

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SOYA DOUGH MAKING MACHINE

NUTRITIONAL FACTS

It contains highest lecithin than any other flour.

Lecithin content in soya bean identical to egg yolks.

This lecithin may get destroyed during milling so it is advised to take whole grain flour rather than cake residue.

In the flours of extraction Vit A is destroyed.

The protein body gets deneutralised.

The cake which is left after extraction is not fit for meal.

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NUTRITIONAL FACTS

Soybean flour is equal to four times flour of cereals.

15-20% of fat.

Soya fat is equal to 20 times of wheat fat.

Its fat content high in Vit A and Vit D

Rich in Potassium, sodium, calcium, calcium, phosphorous, Iron .

It’s a great source of starch and carbohydrates along with proteins and fats of high biological value.

More easily digestible ,high water absorbing Coefficient of digestibility is 95.7%.

Soya can easily replace the costly animal proteins and easily affordable for people in India

Soybean contains highest amount of fat, minerals and least starch.

Highest nutritive and calorific value and biological value.

It can safely replace the costly animal food

Protein in soybean flour compares to milk, fish, chicken and eggs.

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HEALTH BENEFITS OF SOYA CHAAP

Perfect blend of protein vitamins minerals and insoluble fibre.

Lowers the risk of breast cancer among women because of isoflavones.

Reduces cholesterol level

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SCOPE OF BUSINESS OF SOYA CHAAP

The setting up of small scale soya chaap industry is briefed as below.

Since most work is manual, lot of manpower is required.

To begin with 18 -25 are needed to start the industry.

15-25 kw power would be needed to operate the plant at small scale.

Since shaping of these chaaps is done by hand, not many equipment's are required. Basic equipment's like knife, large pots,kneader, weighing scale etc would be sufficient.

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