

# Impact of Entrepreneurship Development Programme on Soybean Processing



**Centre of Excellence on Soybean Processing and Utilization**  
**ICAR – Central Institute of Agricultural Engineering**  
Nabibagh, Berasia Road, Bhopal-462 038 M.P., India





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**Punit Chandra  
R S Singh  
L K Sinha  
K K Singh**

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## Introduction

Soybean has a tremendous potential to be transformed into a number of healthy foods suiting to each individual requirements, across the globe. It is not only a great source of high quality oil, but contains high quality protein and carbohydrates. Proper Entrepreneurship Development Programme (EDP) training is necessary to produce quality soy products. Nutritionally, soy protein is the most balanced plant protein for human consumption. It is high in protein, low in fat and carbohydrate and contains no cholesterol. Owing to its amino acids composition, the protein of soybean is called a complete protein. It is an excellent food for babies, children, elderly people and pregnant and lactating women because it contains vegetable protein which is very nutritious and easy to digest. Consumer acceptance and the demand for highly nutritive low-priced soy based food products are increasing day by day. This indicates soybean is capable of providing nutritional security and better health to Indian masses in near future.

## Soybean Production

The present world production of soybean accounting for nearly 57% of the total oilseeds production provides approximately 60% of vegetable protein and 30% of vegetable oil in the world. The major soybean producing countries of the world are USA (33%), Brazil (32%), Argentina (16%), China (4%), India (3%), Poraguay (3%) and others (5%).

At present, India ranks fifth in the area and production in the world after USA, Brazil, Argentina, and China. Soybean was introduced for cultivation in plains of India around 1965 mainly for meeting protein requirements of growing populations and its food use were advocated. The contribution of India in the world soybean area is 10 %, but the contribution to total world soybean grain is only 4% indicating the poor levels of productivity of the crop in India (1.1 t/ha) as compared to other countries (world average 2.2 t/ha). The major soybean growing states in India are Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Andhra Pradesh, and Chhattisgarh. Total production of soybean in India was 83 million metric tons (MMT) in the year 2017. Madhya Pradesh produced 42 MMT soybean in 2017 followed by Maharashtra (29 MMT). Madhya Pradesh and its adjoining states Maharashtra and Rajasthan account for nearly 97% of soybean area of the country.

## Nutritional Quality of Soybean

Dehulled soybean contain 20% oil, 40% protein, 35% carbohydrates and 5% minerals on a dry matter basis. Soybean has more than two times the amount of



most of the minerals, especially calcium, iron, phosphorus and zinc, than any other legume and very low sodium content. Soybean has all the important vitamins and is a very good source for B complex vitamins and Vitamin E. Soy products can easily meet the dietary protein and other requirements of a population. Soybean also contains phytic acid, saponin, isoflavones like genistein, diadzein and glycitein, which have beneficial effects like prevention of cardiovascular diseases, osteoporosis, etc.

In addition to high-quality protein, soybean contains high levels of unsaturated fatty acids, dietary fiber, isoflavones and minerals, which possess numerous health benefits. In particular, the association of high-quality protein and phytochemicals, especially isoflavones, is unique among plant-based proteins because isoflavones are not widely distributed in plants other than legumes.

### **Soybean in Alleviation of malnutrition**

Proteins from meat and other animal products are costly and only a select group of rich population has access to it. 35-40% of Indian population are below poverty line and do not have enough purchasing power for dietary proteins. 55% children are malnourished and 62.6% women are anemic giving birth to low weight children. The protein-calorie malnutrition problem is acute in rural areas. The dietary survey indicated that on an average only 55% of protein requirement is met by the regular diet. The malnutrition results in frequent illness, loss in weight, weakness, fatigue and also suffering from more severe diseases like diabetes, heart attack, osteoporosis, etc. Though dals (pulses) are the major source of protein for vegetarian diet they contain only 20-22% protein and need to be taken almost 80-100 gm every day per person. Due to their higher cost and larger quantity requirement they are always eaten less than required quantity. Hence there is a need for alternative and better source of protein for Indian rural areas and soybean fits best into this prescription. This calls for providing them an alternative source of dietary protein which could be financially affordable. The utilization of soybean for food uses in India is still meagre, and work needs to be done in terms of production of acceptable soy food products and its inclusion in daily diet of Indian masses to mitigate the widespread energy-protein malnutrition.

### **Health benefits of Soybean**

Soybean has tremendous potential to be transformed into a number of highly nutritive health foods and is gaining consumer acceptance. The demand for these soy products is increasing and their daily use would provide balanced nutrition at

affordable cost. Soybean products are considered as a good substitute for animal protein.

Soybeans is well known for their health-promoting benefits which include antioxidant, anti-obesity, anti-diabetic, properties and prevention of osteoporosis and cancers such as breast and prostate. Soybean-based foods have generated much interest because of the evidence that consumption of large amounts of soybean can lower the risk of chronic diseases such as cardiovascular disease and cancer; this effect is particularly noticeable among Asian populations because of their high soy food intake.

Soy protein also has cholesterol lowering effect and protein hydrolysate or hydrolysed peptides of soybeans decrease blood cholesterol and glucose levels. In addition, consumption of soy foods may reduce the risk of osteoporosis and help alleviate menopausal symptoms which are major health concerns for women.

Soybean contains many kinds of anti-nutritional factors, such as trypsin inhibitor, lectin,  $\alpha$ -amylase inhibiting factor and so on. A number of soy antinutrients have been shown to possess beneficial properties apart from its adverse effects. Beneficial and adverse effect of antinutrients is presented (Table1).

**Table – 1** Beneficial and adverse effect of antinutrients present in soybean

Antinutrients	Beneficial effect	Adverse effect
Trypsin Inhibitor	Anti-cancerous	Pancreatic hypertrophy
Phytic acid	Anti-cancerous, Antioxidants	Decreases the bioavailability of minerals
Isoflavones	Prevention of cardiovascular diseases, cancers, and menopausal symptoms	Hormonal imbalance
Saponins	Anticancer, antioxidant and anticholesterol activity	Membranolytic effects, toxic effects, adverse effects on animal growth and performance
Goitrogens	Anti-cancer property	Interfers iodine uptake
Lectins (Hemagglutinins)	Anti-cancer property	Hemolytic activity



## Soybean Processing

Soybeans used to make soy foods undergo some type of processing and a number of different processes are used, both traditional and modern. Traditional methods include germination, cooking, roasting, and fermenting. More modern processing methods remove undesirable constituents through fractionation or extraction. The traditional soy foods, also known as oriental soy foods, are generally divided into two classes: non fermented and fermented soy foods. Among the non-fermented soy foods, tofu is the most popular, followed by soymilk and soy sprouts.

Basically, Soymilk is a water extract of soybeans, closely resembling dairy milk in appearance and composition. In general soymilk has total solids at 8-10%, depending on the water: bean ratio in its processing. Among them, protein is about 3.6%; fat, 2.0%; carbohydrate, 2.9%, and ash, 0.5%. As soymilk is free of lactose, it is good choice for people who are lactose intolerant. As an alternative to dairy milk, soymilk provides proteins and other nutrients to people in regions where the supply of animal milk is inadequate.

Tofu is a curd that is made directly from soybeans and resembles a soft white cheese. Tofu is water-extracted and salt- or acid-coagulated soy protein gel with water, soy lipids, and other constituents trapped in its network. On a wet basis, a typical pressed tofu with moisture content in the range of 85% contains about 7.8% protein, 4.2% lipid. On the dry matter basis, it contains about 50% protein and 27% oil.

### **Centre of Excellence on Soybean Processing and Utilization Centre (CESPU)**

The Centre of Excellence on Soybean Processing and Utilization Centre, earlier named as Soybean Processing and Utilization Centre (SPU), was established in April, 1985 at the Central Institute of Agricultural Engineering (CIAE), Bhopal by the Indian Council of Agricultural Research (ICAR), New Delhi in collaboration of the United States Agency for International Development (USAID), Washington. The mandate of SPU was to develop proper processing technology for soybean and disseminate those for food uses to make available nutritional and health benefits of soybean to population. Concerted and focussed R & D efforts resulted in development of process technology and equipment for more than 40 soy based food products suiting to Indian tastes and pallets.



## Entrepreneurship Development Programme at CESPU

Entrepreneurship development offers an opportunity for income generation through micro or small-scale soy based food enterprises to have self-employment opportunities and thereby additional income for better life, livelihood & income opportunity and Nutrition security. Since soybean processing at cottage scale offers scope of preparation of quality nutritious products for improving nutritional status of the masses. Commercialisation of technologies through training and entrepreneurship development programme (EDP) is considered as a very effective and potent tool for wealth creation, employment generation and poverty alleviation in India through soybean processing. Realizing the importance of entrepreneurship on soybean processing and economic development through establishment of soy processing enterprise, Central Institute of Agricultural Engineering, Bhopal, an apex body in the area of promotion of entrepreneurship development on soybean processing for small businesses organises, started 6 day tailor-made regular training programmes package to upcoming entrepreneurs on soybean processing in 1995

The centre provides hands-on practical training, all necessary technical guidance to the upcoming/budding entrepreneurs/aspiring youth to learn manufacturing process for various soy products coupled with technology/project report preparation etc. The training for Entrepreneurship Development Programme on Soybean Processing is provided to the upcoming entrepreneurs at Centre of Excellence on Soybean Processing and Utilization, Central Institute of Agricultural Engineering (CIAE), Bhopal using its well-developed production facilities of pilot plants and demo units for nutritious soy products.

Thus, the center not only helps in transforming unemployed to self-employed but also helping in enhancing the nutritional status of the masses of nearby local areas.

Anyone can take training on either module of soybean processing. If one desires training on both modules, one can do that by taking four additional day training covering all aspects. It is not a sponsored training programme and candidates bear cost of training fees, travel, lodging and boarding. The training doesn't have any prerequisite of educational qualification. People from all walks of life including MBA's, engineers, doctors, politicians, farmers, graduates, post graduates and even illiterate took training. Many persons who took training from other sources also came here because they were not given complete knowledge.

It has provided entrepreneurship development training to more than 2500 upcoming entrepreneurs. Out of which about 200 have established their



enterprises and have been running them successfully. The establishment of these enterprises for production of various soy products is not only providing the livelihood opportunities to many but also making the nutritious products available to masses for combating malnutrition in the catchment area. In addition to the technologies for the processing of soybeans for wider utilization the EDP has contributed to the expansion of soy processing in India.

### **Impact Assessment study of EDP programme at CESPUP**

As the activity was not documented, a need was felt to collect detailed information on trained personnel who established enterprise all over the India. Effort was made to assess the impact of entrepreneurship development programme on enterprise development and livelihood opportunities.

### **Collection of information from the trainees of EDP on soybean processing**

Data comprising of information on batch number, duration of training and year, name and address of the trainee were compiled and the information related to all the persons trained under EDP on soybean processing (soy milk & tofu and soy flour & biscuit) was digitized.

Different approach were attempted to collect the information about setting up of enterprise.

1. Letters were sent to all the trainees on the postal address available in their records. Response was very poor and only 150 responses were received.
2. Trainees were contacted telephonically whose contact numbers were available to enquire about their enterprise.
3. Visits were made to different places across India to collect the information. To do so questionnaire was prepared to get the information on
  - a. Trainee who is running the unit successfully
  - b. Trainee who started the unit but closed after some time
  - c. Trainee who did not setup the unit.

The trainees under category (a) were asked to give the details of their unit and products whereas the trainees under category (b) were enquired about the reasons that led to the closure of the unit and the trainees under category (c) were asked to elaborate the reasons for not setting up the unit.

After collecting the responses of trainees data were analysed and on the basis of available information.

## State wise distribution of Trainees

Till February 2017, 167 batches, of various sizes, were given training at ICAR – CIAE, Bhopal on soy milk and tofu production. Total 2524 persons took training on entrepreneurship development programme on soybean processing out of which 2206 persons took training on soy milk and soy paneer production and 318 persons took training on soy based bakery products and soy snacks. Persons from all the corner of the country took training at ICAR-CIAE Bhopal. Trainees from 28 states/ UT took training at CIAE, Bhopal. State wise distribution of trainees of different states is given in figure 1. More than 50 trainees were from 10 states that include Uttarakhand, Chhattisgarh, Gujarat, Delhi, Rajasthan, Haryana, Uttar Pradesh, Punjab, Maharashtra and Madhya Pradesh. Maximum number of 615 trainees were from Madhya Pradesh followed by Maharashtra, Punjab, Uttar Pradesh, Haryana, Rajasthan and Delhi. About 87% persons took training in soy milk and soy paneer production. 13% took training on soy based bakery products and soy snacks.

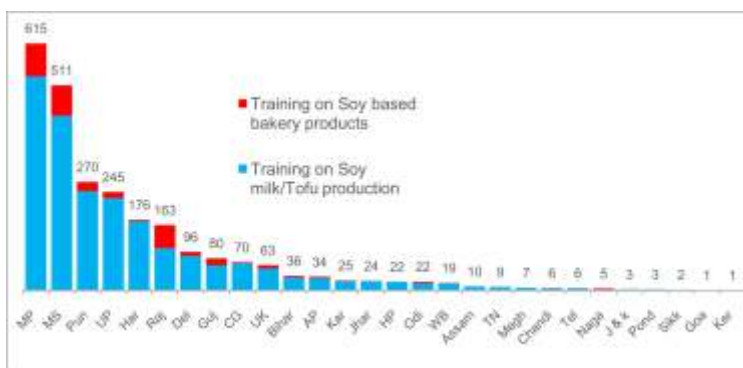


Figure 1 - State wise distribution of Trainees

At the commencement of training in 1995 number of trainees was less than hundred per year. After 2008 the number of trainees increased above hundred (Figure 2).

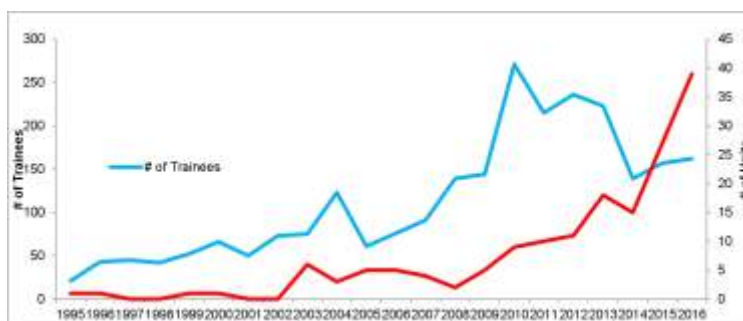


Figure 2 – Year wise distribution of Trainees and working units on Soybean processing



## Information about established units

Presently, one hundred ninety eight units are involved in soybean processing (Figure 3). The units are established in different parts of country that includes 17 states, however, maximum 41 units are located in Punjab state followed by Maharashtra (40 units), Uttar Pradesh (23 unit), Haryana (21 unit), Delhi (15 unit) and Madhya Pradesh (14 unit). The establishment of unit geared up after 2010. Out of total working unit, only 36 were established before 2010. More than 162 unit are established after 2010 in the time span of 7 years. Trainees also increased after 2008. ICAR - CIAE played major role in creating awareness about soybean and its utility in establishing processing units. This may be reason for increase in working unit. 5 persons also established units for the production of soy milk manufacturing plant. There are some cases of closure of soy processing units. Approximately 14 % trainees established the enterprise but closed it at later stage. Major problem is associated with marketing of the product.

Surprisingly, Punjab does not produce soybean, however, maximum unit are established there only. The data indicates that high capacity units producing more than 500 kilogram of tofu or 500 liters of soy milk per day are established in Punjab.

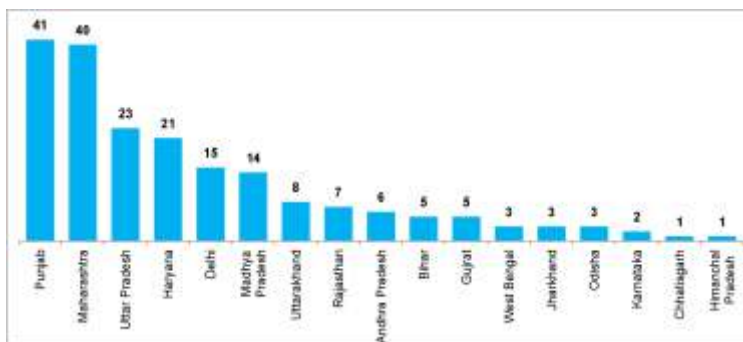


Figure 3 - State wise distribution of units on Soybean processing (Total 198)

## Production of Soy products

Distribution of soy products manufacturing across working units indicates that 10.4% trainees are involved in soy milk production whereas 46% are engaged only in Tofu production. 30% are producing both soy milk and tofu. Only 3% trainees are involved in producing products other than soy milk and tofu that includes soy curd, soy nuts and soy flour (Figure 4).

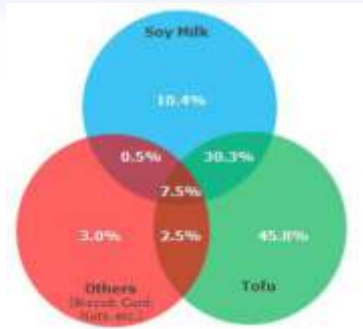


Figure 4 – Production of Soy based food products by different trainees

As is evident from figure 5 that about 50 percent trainees are producing around 50 litres of soy milk/ 50 kg tofu per day. Most of the trainees producing products more than 250 kg are located in Punjab and Maharashtra. Around 15% of trainees manufacture soy milk or tofu on demand especially in festive/ marriage season.

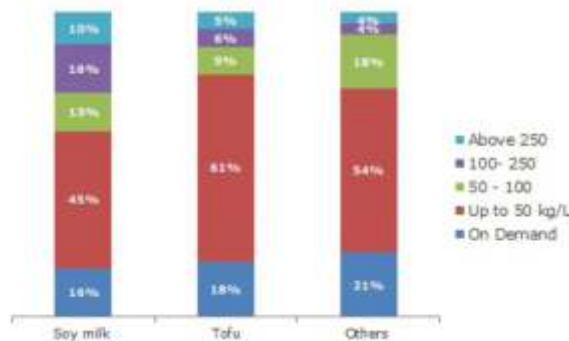


Figure 5 – Quantity of product produced (%) by different trainees

Annual production of different soy products manufactured by trainees is presented in figure 6. Based on the information collected, the average annual production of Tofu and soy milk is 2700 ton and 3400 kilolitres, respectively. As is evident from the figure that 53% soy product is soy milk and 42% is in the form of tofu. Other product covers only 5% of total produce.

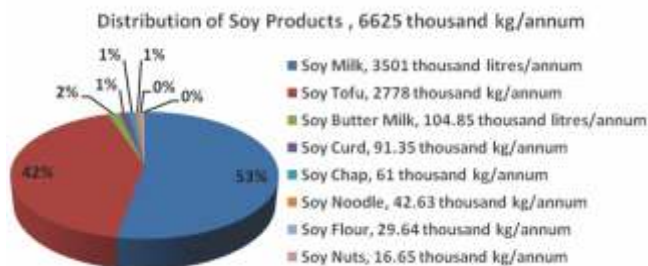


Figure 6 – Annual Production of Soy products



Total Soy milk production per day is 17247 litre. In Punjab 11415 litre soy milk is produced per day that amounts 66% of total production. 11% soy milk is produced in Maharashtra. Similarly, total tofu production per day is 13716 kg and 68% of total production is produced in Punjab only (9373 kg). 8% is produced in Maharashtra.

Among 198 trainees, S.Bachittar Singh Garcha, Varinder Singh, Kulvindar Singh, Kuldeep singh Cheema, Jarnail Singh, Ajmer Singh from Punjab, Vishal Dhanpal, Dilip Talwalkar from Maharashtra, Daksh Gupta, Harish Yadav from Delhi, Dharamveer Singh from UP are the ones who are producing more than 250 kg of tofu or 250 litre of soy milk per day.

Entrepreneurship development programme is useful to the trainees. This will not only provide a livelihood generation opportunities but also can encourage the trainees to take up the entrepreneurial activities.

The establishment of the plant, consumer acceptance and the demand for highly nutritive low-priced soy based food products are increasing day by day. This is not only providing the income generating activities and livelihood opportunities but also helping in eradication of malnutrition by making available the nutritious soy products in the area.

Assessment of impact of Entrepreneurship Development Training on Soybean Processing has indicated about 8 % conversion of the soy enterprises. It, therefore, ensures economic viability of soybean industry and promises house hold nutritional security and better health in near future. This indicates bright future for soybean in India.

## **Economic evaluation of soybean entrepreneurship**

Economic analysis of soybean entrepreneurship was revealed that processing of soybean was carried out to make different products like milk, tofu, flours, nuts, curd, biscuits, Kabab, chap and Halwa etc. These products are made by the 198 entrepreneurs across the country but majority of entrepreneurs belong to the States of Punjab, Maharashtra, Haryana, Uttar Pradesh, Bihar, Jharkhand, Odisha and Uttarakhand. Annual working days of these units are 203 while labour employment was analyzed 4.73/unit. These entrepreneurs are generating employment to the tune of 1.90 lakh mandays/annum and provide the monetary benefits of 5.70 crores to 936 workers engaged to run the 198 soybean processing units. Annual gross return has been found to be Rs 28.18 lakh/entrepreneur with an annual gross cost of Rs 17.00 lakh/entrepreneur. Thus, annual net return realized to the extent of Rs 11.20 lakh/entrepreneur with a BCR of 1.66. Annual gross

monetary benefit has been generated from 198 entrepreneurs are Rs 55.80 crores (Table 1).

**Table 1.** Economic evaluation of soybean entrepreneurship

S No	Particulars	Values
1	Total entrepreneurs	198
2	Total employment generated, lac mandays/annum	1.9
3	Employment/ unit, no of workers	4.73
4	Annual working days	203
5	Annual gross return/entrepreneur, lac Rs	28.18
6	Annual gross cost/entrepreneur, lac Rs	17.00
7	Annual net return/entrepreneur, lac Rs	11.20
8	Total return/day, Rs	13858
9	Total cost/day, Rs	8356
10	Net return/day, Rs	5502
11	BCR	1.66
12	Annual gross return generated from 198 entrepreneurs, Rs crore	55.8
13	Annual net return generated from 198 entrepreneurs, Rs crore	22.15
14	Annual monetary benefits to 936 workers, Rs crore	5.7

### Protein content supplied by the soybean processed products

In spite of economic impact of soybean entrepreneurships a sizeable quantity of protein content through different soybean processed products are supplemented to the consumer's diet on daily basis. Maximum contribution is found through soy milk (52.78%) followed by soy tofu (1.97%) of the total protein supplied. Share of other products has been found in meagre quantity, Table 2.

**Table 2.** Annual soybean based protein content supplied to consumer's diet

S No	Particulars	Values
1	Soy milk, thousand litres/annum	3501 (52.78)
2	Soy tofu, thousand kg/annum	2784 (41.97)
3	Soy flour, thousand litres/annum	29.64 (0.45)
4	Soy curd, thousand kg/annum	91.35 (1.38)
5	Soy nuts, thousand kg/annum	18.47 (0.28)
6	Soy butter milk, thousand litres/annum	104.85 (1.58)



S No	Particulars	Values
7	Soy chap, thousand kg/annum	101.5 (1.53)
8	Soy noodle, thousand kg/annum	2.03 (0.03)
	<b>Total</b>	<b>6632.84 (100)</b>

(Figures in parenthesis indicates %age to total)

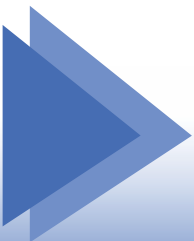
The protein content in paneer and dairy milk is almost same. Considering the average cost of tofu @ Rs. 118/ kg and soy milk @ Rs. 27/ litre, we save approximately Rs. 943 per kg of protein produced from soy milk and tofu.

**Economic evaluation of soybean entrepreneurship based on production**

There is a wide variation in terms of the production of different soybean processed products so far as the scale of operation is concerned. Keeping in view these variations 198 entrepreneurs are categorized in the following four groups on the basis of processed products quantity to capture the group wise production and return scenario.

- Group i (Up to 50 kg or l)
- Group ii (51 – 100 kg or l)
- Group iii (101 -250 kg or l)
- Group iv (251 & above kg or l)

About 67% of the entrepreneurs falling under the group-i followed by 14% in the group-iv, 12% under group-ii and 8% in group-iii. Highest annual working days as 229 was existing in the both group-iii & iv followed by group-ii & i. Daily production of milk was 557 l/day in group –iv followed by group-iii (153 l), group-ii (84 l) and group-I (24 l). Milk production cost was highest as Rs 36/l in group-iii and lowest as Rs 23/l in group-iv. Sale price of milk from the entrepreneurs of group-iv was also observed lower (Rs 45.6/l) as compared to the entrepreneurs of the other groups. Thus, we may conclude that production cost and sale price of milk was lower in case of big entrepreneurs as compared to the medium and small due to their better efficiency of inputs and management.





**Table 3-** Annual soybean based protein content supplied to consumer's diet

S No	Particulars	Values			
		Group- i (Up to 50)	Group- ii (51-100)	Group- iii (101-250)	Group- iv (251& above)
1	No of entrepreneurs	132	23	16	27
2	Annual working , days/annum	195 (ranged9 0 -300)	203 (ranged9 0 -240)	229 (ranged 150-300)	229 (ranged 150-300 )
3	Production of milk, l/day	24 (ranged 1 -50)	84 (ranged3 0 -100)	153 (ranged 10-250)	557 (ranged 60-3600 )
4	Production of milk, 000l/annum	4.7	17.1	35.1	128.0
5	Production cost of milk, Rs/l	27.0 (ranged 14 -50)	33.0 (ranged 18-45 )	36.0 (ranged 20-95)	23.0 (ranged 10-30 )
6	Sale price of milk, Rs/l	51.6 (ranged 25 -100)	59 (ranged 25-80 )	65.0 (ranged 30-175 )	45.6 (ranged 25-100 )
7	Production of Tofu, kg/day	15.80 (ranged 1 -50)	60 (ranged 7-100)	115.00 (ranged 5-250)	374.2 (ranged 20-3500 )
8	Production of Tofu, 000'kg/annum	3.1	12.2	24.1	86.0
9	Production cost of Tofu, Rs/kg	79.3 (ranged 60-125)	72.0 (ranged4 0-100 )	66.3 (ranged 50-100 )	63.3 (ranged 45-80 )
10	Sale price of Tofu, Rs/kg	146 (ranged 60-250 )	130.0 (ranged6 0-225 )	98.3 (ranged 80-170 )	103.0 (ranged 60-240 )
11	Gross Return (milk +Tofu + others), lac Rs/annum	5.5	21.8	43.1	135.7
12	Gross cost (milk +Tofu + others),Rs/annum	3.1	12.1	27.8	82.7
13	Net Return (milk +Tofu + others), Rs/annum	2.4	10	15.3	53.0
14	BCR	1.78	1.80	1.55	1.64

Tofu production cost of group-iv entrepreneurs was also found lower as compared to the other group entrepreneurs due to better management. Sale price of tofu was ranked first in group-iv followed by group –ii, iv and group-iii. It was observed during the survey that the sale price was mostly governed by the theory of supply & demand of products. Net return of the entrepreneurs from group-iv was Rs53 lakh/annum followed by Rs 15.3 lakh /annum of group –iii, Rs 10 lakh /annum of group-ii and 2.4 lakh /annum of group –i. Entrepreneurs of group-ii were economically more viable with BCR 1.80 followed by entrepreneurs of group –i, iv & iii. Majority of entrepreneurs of group-iv are located in Punjab and are facing neck to neck competition in the sale prices of products due to higher capacity of several processing units, resulting in surplus supply of products.



Apart from the 198 enterprises engaged in production of soy based food products, 5 trainees also established unit of machinery for soy milk production. As per the information available, total 33 units are manufactured annually with a net profit of Rs. 30.31 lakhs. Details are given in table 4.

**Table 4** – Net return in Production of Soy milk plant

	Nos. of unit	Sale cost (lakhs)	Total Return, Rs in lakh	Cost involved, Rs in lakh	Net profit, Rs in lakh
Total	33	11.6	78.1	47.79	30.31
Average	6.6	2.32	15.62	9.558	6.062

Complete detail of each successful trainee including date of establishment, soy product produced, net return per day and annual net return is given in Annexure I.

The data and information provided in the report is based on personal interaction and telephonic conversations with the trainees.

## Summary

Soybean is not only a great source of high quality oil, but is also rich in protein and carbohydrates. Soybean contains 20% oil, 40% protein, 35% carbohydrates and 5% minerals on a dry matter basis. Soybean has more than twice the amount of majority of the minerals, especially calcium, iron, phosphorus and zinc, as compare to any other legume but very low sodium content. Soybean has tremendous potential to be transformed into a number of highly nutritive health foods and is gaining consumer acceptance. Soybeans are well known for their health-promoting benefits which includes antioxidant, anti-obesity, anti-diabetic, properties and prevention of osteoporosis and cancers such as breast and prostate. Soybean-based foods have generated much interest because of the evidence that consumption of large amounts of soybean can lower the risk of chronic diseases such as cardiovascular disease and cancer.

Among the non-fermented soy foods, tofu is the most popular, followed by soymilk and soy sprouts.

The Centre of Excellence on Soybean Processing and Utilization Centre established in April, 1985 at the ICAR-Central Institute of Agricultural Engineering (ICAR-CIAE), Bhopal imparts a 6 day tailor-made hands-on practical training to upcoming entrepreneurs in soybean processing since 1995. Thus, the center not only helps in transforming unemployed to self-employed but also helps in enhancing the nutritional status of the masses of nearby local areas. The training doesn't have any prerequisite of educational qualification. People from all walks of life can take training. It has provided entrepreneurship development training to more than 2500 upcoming entrepreneurs. Out of which about 198 have established their enterprises and are running them successfully. The establishment of these enterprises for production of various soy products is not only providing livelihood opportunities to many but is also making the nutritious products available to masses for combating malnutrition in the catchment area. In addition to the technologies for the processing of soybeans for wider utilization the EDP has contributed to the expansion of soy processing in India. The units are distributed in different parts of country and includes 17 states, however, maximum 41 unit are located in Punjab state followed by Maharashtra (40 unit), U P (23 unit), Haryana (21 unit), Delhi (15 unit) and Madhya Pradesh (14 unit). The establishment of unit geared up after 2010. Out of total working unit only 36 were established before 2010. More than 162 unit are established after 2010 in the time span of 7 years. Annual production of Tofu and soy milk is 2700 ton and 3400 kilolitres, respectively.

## WORKING UNITS OF ENTREPRENEURS











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**Director**

**ICAR-Central Institute of Agricultural Engineering**

Nabi bagh, Berasia Road, Bhopal-462038

Tel.: 0755-2521001/1133 Fax: 0755-2734016, 2733308

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