

Knowledge and Constraints of Cottage Scale Soy Processor Dairies in Punjab : An Assessment

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ABSTRACT

The rural youth and farmers in Punjab particularly small and marginal are showing keen interest in adoption of soy processing as an enterprise because of its high profitability. As the rice-wheat system being followed from decades has ruined our eco system in Punjab, popularization of this enterprise can promote diversification by boosting soybean cultivation. Status of its adoption in the state needs to be assessed. An initial survey reveals that though the enterprise is very lucrative, there are number of constraints being encountered by soy processors at various levels. So, the present study was carried out to find out the knowledge level of soy processors about soy processing technologies, explore the relationship between each of the selected characteristics of the soy processors and their knowledge level and identify the constraints confronted by the soy processors. Majority of the respondents (70.0 %) had medium level of knowledge on soy processing technologies. The characteristics of the respondents' viz. education, training experience and extension media contact had positive influence on the knowledge level of the respondents regarding soy processing technologies. The analysis showed that processing of soybean into soymilk, tofu, soy flour and soy nuts were found to be preferred by the respondents owing to their demand in the market. The study showed that 92.0% of the respondents highlighted the high cost of soybean as major constraint whereas 82.0% showed short shelf life of products as a limiting factor followed by unavailability of trained labour (74.0%) and lack of finance (62.0%). Lack of awareness regarding health benefits of soybean (58.0%) and lack of direct marketing channels (52.0%) were also among the important constraints perceived by the respondents.

Key words : Constraints; Soybean; Soy dairies; Knowledge level; Soy milk;

The food and nutrition security of the population has been the matter of concern world over. The population segments who do not possess adequate purchasing power suffer from food and nutrition security. Soybean has been identified as a low cost nutrition rich food raw material which has potential to help enhance the food availability with nutrition (Kulkarni, 2009). Soybean is one of such crops which occupy a premier position as a world crop because of its high protein (38-42%) and fat (18-20%) content. The quality of soy protein is the best among all plant proteins and it is the most economical protein source in the world (Beniwal et al 2013). Jaiswal (2008) found that for every rupee of investment in soy milk and tofu processing, about Rs. 1.42 was obtained as returns, indicating its profitability. Since the value addition is profitable over raw soybean, farmers may be motivated to keep up value addition to soybean. The people most familiar with

the crop have been the Asians, but the largest commercial cultivation of soybeans is currently in USA. Soybean was introduced in India sometime in early 1960's as an economical source of nutrition. The major soybean growing states of India are Madhya Pradesh, Maharashtra and Rajasthan. Punjab has negligible share in soybean production. But, soybean is being processed on commercial scale in Punjab. Many a small entrepreneurs are now processing soybean into milk and paneer (Tofu). An initial interaction with the entrepreneurs led us to identify problems faced by them in the enterprise. Moreover, because of the presence of antinutritional factors, proper processing of soybean is required before consumption. So, the present study was carried out with the following specific objectives a) to assess the knowledge level of respondents about soy processing technologies, b) to explore the relationship between each of the selected characteristics of the

respondents and their knowledge level c) to identify the soy products having market potential d) to identify the constraints as confronted by the respondents in establishment of soy dairies.

METHODOLOGY

The study used a descriptive survey design. The population of the study included the soy processors of Punjab state and the study was conducted during 2010-11. A total of 70 soy processors were identified in the state, out of which 50 were selected as sample following simple random sampling technique. The socio-economic characteristics of the respondents were analyzed using frequency and percentage.

A questionnaire was developed and knowledge level of the respondents was assessed by asking 10 questions about different aspects of soy processing through personal interview method. Each of the question was assigned score 1. For each of the correct answer, the respondents could secure score one while for wrong answer he may obtain zero score. Therefore, the knowledge score of the respondents could vary from zero to ten. Where zero indicates no knowledge and 10 indicates the highest knowledge level about soybean processing technologies.

The dependant variable of this study was knowledge level of respondents. The following characteristics were selected as independent variables: age, education, training experience and extension media contact. The relationship was further explored between each of the selected characteristics of respondents (independent variables) and their level of knowledge regarding soy processing technologies (dependent variable). Likert scaling and mean were used to identify the various types of soybean products having market potential. Likert scaling was based on a four point rating scale of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD) with assigned values of 4, 3, 2 and 1 respectively. To determine the cutoff point for decision, any item that received a mean score rating of 3.0 and above was regarded/adjudged as “agreed” while the item that received a mean score lower than 3.0 was regarded as “disagreed”. Further, the respondents were asked to report the constraints experienced by them in establishment of soy dairies. The data was tabulated and analyzed statistically following mean, standard deviation and correlation method

RESULTS AND DISCUSSION

The knowledge of the socio-economic characteristics of the respondents would facilitate in better understanding of the ground realities of the study area. Hence, the data were collected and analyzed in this regard.

Table 1: Socio-economic profile of the respondents

Particulars		No.	%
Age (years)	Av. ±41.2 (29-52)		
Main Occupation	a) Farming	12	24
	b) Others	38	76
Family Type	a) Joint	32	64
	b) Nuclear	18	36
Education	a) Illiterate	0	0
	b) Primary	5	10
	c) Middle	20	40
	d) High school	20	40
	e) Degree	5	10
Training experience		30	60

Majority of the respondents were middle aged with an average age of 41.2 years of the sample farmers in the study area (Table 1). From this it can be inferred that because of non availability of alternate jobs, respondents were adopting other enterprises alogwith agriculture. Majority of the respondents belongs to the joint family type mainly dominated by male member in the family. It is interesting to note that nearly 90 per cent of the farmers were literate, however, majority of farmers were educated upto middle and high school. Around 60 per cent of the respondents had training experience regarding soy processing technologies.

Table 2: Distribution of respondents as per knowledge assessment score (out of 10)

Knowledge score	Category	No.
1-4	Low	5
5-8	medium	35
9-10	High	10

Knowledge assessment: The knowledge assessment score of the respondents ranged from 4 to 10 with an average score of 7.1 and standard deviation of 1.99. According to the knowledge assessment score, the respondents were classified into three categories. Findings presented in Table. 2 reveals that majority of them (70.0%) had medium level of knowledge followed by 20.0 per cent of them having high level of knowledge while only 10.0 percent were found to have low

knowledge level about soy processing technologies. The finding that majority of the respondents (70.0%) had medium level of knowledge on soy processing may be attributed to the fact that most of them had received training before starting the enterprise.

Relationship between respondents' characteristics and their knowledge score: Farmers score differently due to their varied personal, socio-economic or psycho-physical characteristics. Hence, the nature of relationship between respondents' characteristics and their knowledge score was assessed by correlation co-efficient (Table 3).

Table 3: Correlation between knowledge score of the respondents and their selected characteristics

Personal attributes	Correlation coefficient (r)
Age	-0.88*
Education	0.66
Training Experience	0.80
Extension media contact	0.70
Main occupation	0.25*
Type of family	0.23*

*Non-significant at $p < 0.05$ level of significance

Farmers score differently due to their varied personal, socio-economic or psycho-physical characteristics. Hence, the nature of relationship between respondents' characteristics and their knowledge score was assessed by correlation co-efficient (Table 3).

Three of the selected characteristics of the respondents out of six viz. education, training experience and extension media contact showed significant positive correlation with the knowledge level of respondents. The relationship between education of the respondents and their knowledge level as reflected by r value (0.66) was significant. This implied that the education of the respondents had significant positive relationship with their knowledge level about soy processing technologies i.e. more education the soy processor had, more knowledge about soy processing technologies he have. The correlation co-efficient between training experiences of the respondents and their knowledge level was 0.80 (Table. 3). This led to the fact that training of the respondents had a significant positive influence on their knowledge level about soy processing. Furthermore, the respondents having long duration trainings are expected to show high level of knowledge.

There is also a significant positive association ($r = 0.7$) between extension media contact of the respondents and their knowledge level about soy processing technologies. The above findings suggested that soy processors maintaining frequent extension contacts are having better knowledge regarding soy processing technologies. An interesting finding was that the age of the respondents showed non-significant relationship ($r = -0.88$) with knowledge level of the respondents which lead to the fact that knowledge level of the respondents was not affected by the age of the respondents and the enterprise can be adopted by farmers of varying age equally. Similarly, main occupation ($r = 0.25$) and type of family ($r = 0.23$) also showed non-significant relationship with knowledge level of the respondents.

Table 4: Mean distribution of soybean products according to their demand in the market

Item	SA	A	D	SD	Mean	Remarks
Soy milk	32	12	6	-	3.52	Agree
Soy paneer (Tofu)	28	12	6	4	3.28	Agree
Soy dahi	-	8	21	21	1.74	Disagree
Soy lassi	-	4	28	18	1.56	Disagree
Soy flour	28	19	3	-	3.50	Agree
Soy nuts	26	13	5	6	3.18	Agree

SA=Strongly agree (4), A= Agree (3), D=disagree (2) and SD=Strongly disagree (1)

Mean distribution of soybean products: Soy processors were asked to report their response about the availability of market for various types of soybean products in the study area. From Table 4, 'Soy milk', 'Soy paneer (Tofu)', 'Soy flour' and 'Soy nuts' have mean score above cutoff point 3.0 and 'Soy dahi' and 'Soy lassi' have mean score below cutoff point. This implies that items with mean score above cutoff point 3.0 have their demand in the market while items with mean score below cutoff point are fairly or not having demand in the market. The analysis showed that 'Soy milk', 'Soy paneer', 'Soy flour' and 'Soy nuts' are produced commercially. On the other hand soy dahi and soy lassi are rarely processed in the study area.

Constraints of soy dairies as perceived by the respondents : Soy processors confronted with copious problems in soy processing. Many of the processors adopted soy processing as a major profession, they spent

all out effort to secure stable income, but in many cases they failed to harvest maximum profit because of the prevalence and emergence of untoward situations. During the investigation, the respondents were interviewed extensively to identify various constraints which were grouped into four categories (Table. 5) viz. production, marketing, financial and information of transfer of technology

Production constraints: Most crucial problem the processors confronted with was high cost of soybean (92.0%) followed by unavailability of trained labour (74.0%) as shown in Table 4. In Punjab, local production of soybean is less owing to negligible area under the crop. The requirement of soybean for processing is mostly met from other states which add to cost of inputs. Further, entrepreneurs initially tried locally grown soybean, they found the colour of tofu from local soybean was lesser white in color and consists of more beany flavor. Less product recovery is also one of the reasons given by respondents for non-preference of local soybean. Irregular supply of electricity (20.0%) may be due to the lack of proper government policy and this problem should be solved so that people can come forward to adopt it. 14.0% of the respondents reported high cost of machinery as another constraint etc.

Marketing constraints: The foremost constraint expressed by 82.0% of the respondents was short shelf life of the product (Table 5). Soy milk and paneer require cold storage facilities or other advance machineries like vacuum packing and sterilization equipment for extension of shelf life of products which thereby increase the cost. *Singh (2008)* found that major problem faced by processing sector were lack of storage infrastructure leading to wastage and increasing unit price of finally available product, lack of market intelligence and refrigerated storage facilities. The second key problem prevalent was lack of direct marketing channel expressed by 52% of the respondents. It was also observed that almost every village is linked with pucca roads even though there is lack of proper knowledge and guidance regarding government marketing facilities due to influence of middle man therefore, possibility to train them with respect to direct marketing is there. The other important constraints reported by the respondents were lack of transportation facilities (38%) and competition with multi-national companies (12%).

Table 5: Constraints of soy dairies as perceived by the respondents

Constraint	No.	%	Rank
<i>Production</i>			
High cost of soybean	46	92.0	I
High cost of machinery	07	14.0	XIII
unavailability of trained labour	37	74.0	III
Irregular supply of electricity	10	20.0	XI
<i>Marketing</i>			
Short shelf life of products	41	82.0	II
Lack of direct marketing channels	26	52.0	VI
Lack of transportation and storage facilities	19	38.0	IX
Competition with multi-national companies	6	12	XIV
<i>Financial</i>			
Lack of finance	31	62.0	IV
Inadequate facilities and complexity of procedures regarding funds provided through institutional sources	23	46.0	VII
<i>Transfer of Technology</i>			
Lack of awareness among people regarding health benefits of soybean	29	58.0	V
Inadequate knowledge about processing technologies	13	16.0	XII
Lack of long duration training programmes	17	34.0	X
Lack of current information about marketing	21	42.0	VIII

Financial constraints: Lack of finance required for smooth running and upgradation of enterprise is the foremost constraint expressed by the respondents (62.0%) (Table 5). Most of the respondents felt that up-gradation of units is required with time to meet the consumers expectations. The cost of the production increased every year due to increased labour charges and input costs. The second constraint expressed by 46.0% of the respondents was inadequate facilities and complexity of procedures regarding funds provided through institutional sources.

Transfer of technology constraint: As regards information transfer constraints, lack of awareness regarding health benefits of soybean was major constraint reported by 58.0% respondents in the study area (Table 5). The respondents alleged that extension functionaries of the state departments/university of

agriculture were not taking adequate efforts to create awareness regarding the health benefits of soy products at village level. *Madrell (2009)* found that health and wellness are the main drivers for new product development in dairy beverages and soymilk. The other important constraint expressed by 42.0% respondents was lack of current information about marketing. This might be due to low educational level and poor economic conditions of the soy processors. The third constraint expressed by the respondents (34.0%) were lack of long duration training programmes followed by inadequate knowledge about processing technologies expressed by 16% of the respondents. *Beniwal et al (2013)* also emphasized that method demonstrations need to be designed for budding entrepreneurs and women by technical organizations for commercial production and utilization of soy products at local level.

CONCLUSION

Majority of the respondents had medium level of knowledge about soy processing. Three selected characteristics of soy processors out of four viz. education, training experience and extension media contact showed positive relationship with their knowledge level regarding soy processing. Only age showed non-significant relationship with knowledge level of respondents. On the basis of the study, it can be

concluded that high cost of soybean (92.0%), short shelf life of products (82.0%), unavailability of trained labour (74.0%) and lack of finance (62.0%) were found to be the important constraints perceived by the respondents. The other important constraints were lack of awareness regarding health benefits of soybean (58.0%), lack of direct marketing channel (52.0%), inadequate facilities and complexity of procedures regarding funds provided through institutional sources (46.0%). This analysis of constraints can be of use for the researchers and policy makers to plan and modify the research and extension programmes and for the officials of the state department of agriculture so as to eliminate these constraints of soy processors. There is also need to develop varieties with required processing quality characteristics suited to local conditions so that the objective of diversification can be achieved. Package of Practices on soybean products processing and use should be published in local language. Farmers should encourage for cultivation of soybean locally and there should be a buy back arrangement either through farmers group or cooperatives. Truly, there is ample scope to increase the area under soybean cultivation. Soybean can be a potential alternative to break the paddy > wheat cycle.

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