CONSTRAINTS ANALYSIS IN PROCUREMENT AND PROCESSING OF SESAME IN NORTHERN TELANGANA ZONE, TELANGANA, INDIA

ABSTRACT

Sesame is one of the most commonly consumed foods either in fresh as raw seeds or processed. Sesame seeds contain 50-60 per cent oil. The study was aimed to document the constraints in procurement and processing of sesame in the study region. Three districts Jagtial, Nirmal andNizamabad were selected from Northern Telangana Zone where sesame production was highest. Random sampling method was used to select the sesame processors. A total of 30 sesame oil units were selected from three districts for collecting data. The collected data has been analysed through Garette Ranking Technique. The major constraints faced by the processors at different stages of processing of sesame in the study region were high cost of machinery, insufficient funds from the financial institutions, lack of quality raw material, high cost for machinery repairs and maintenance, lack of efficient market for the final product and lack of awareness about the product.

Keywords: Sesame processors; Sesame edible oil; Constraints; Garett ranking

1. Introduction

Sesame (Sesamum indicum) is an ancient crop originated from Africa and Turkey. Among the oil seed crops, sesame enjoys a special status and is often called as the "Queen of seeds". (Pathak *et al.* 2014).Sesame is grown in areas with annual rainfall of 625-1100mm and temperature of >270C. The crop is tolerant to drought, but not to water logging and excessive rainfall. Sesame is well adapted to a wide range of soils, but requires deep, well-drained, fertile sandy loams. Sesame is ready for harvesting in 90 to 120 days after planting depending on variety. In general, non-branched varieties mature earlier and harvesting starts when 75% of the pod/capsules are ripened. Two weeks after harvesting, thrash and winnow the seeds. Thrashing ground should be concrete floor or use canvases to free from soil, gravel, dust and other inert materials that reduce quality of sesame seed. Freshly thrashed seed above 7% moisture content. Clean and dry in sun for about 7 days before bagging and transporting and stored at moisture content below 7%. Stacked sesame should be stored in a dark place at low temperatures (below 18°C) and low relative humidity. (Source: www.researchgate.net).

Sesame is one of the most commonly consumed foods either in fresh as raw seeds or processed. Sesame seeds contain 50-60 per cent oil. (Prasad *et al.*2012). Myanmar, India and China are the top three sesame producing countries in the world. India is the second largest producer of sesame crop. In India the area cultivated under sesame crop is 1.6 million hectares, production is 0.82 MT and productivity is 405 kg/ha in the year 2020-21. (source: www.indiastat.com). Sesame oil is a polyunsaturated semi drying oil. Sesame seed oil can be produced from black hulled and white hulled sesame seeds. Refined oils are extracted using high heat and chemical solvents by grinding seeds at high speed which can generate heat up to 200^0C and using chemicals. Cold pressing is a

mechanical process in which the oil is extracted from the seeds without addition of chemicals or any other substances at a temperature that does not exceed 35^0C.

1.1.Process of refined sesame oil extraction

The sesame seeds received by the processors either from farmers or wholesalers are washed using the seed cleaning equipment to remove the unwanted particles. It helps in sorting out the good seeds and cleaning them to remove dust, foreign matter and stones. Then, the sesame seeds were dried by roasting. After that the seeds were cooked ready for crushing. The seeds were heated to remove excess water after the cleaning process. Once the seeds have been dried completely they are ready for pressing by sesame oil expeller press. The oil was then given some time to settle after the oil has been pressed from the seeds. After the oil has settled, there is the presence of oil cakes that are mixed with the oil. So, the oil is subjected to the process of filtration to separate cakes from the oil, this will make the refining level easier to extract the final oil. After filtration there was last and final filtration before the oil is packed. The filtration ensures that the oil is fully pure and does not have any oil cakes in it. Once the oil has settled and filtered it is now ready for packing. The pure refined sesame oil is then packed into cantor bottles and labelled for marketing.(Source: Nataraj refined sesame oil unit, Jagtial, Telangana).

1.2.Process of cold pressed sesame oil extraction

The sesame seeds required to extract edible oil were procured from the wholesalers and farmers. The moisture content in the seeds at the time of procurement will be 12-15 percent. The seed is kept for natural drying at room temperature about a day to reduce the moisture content to 7-8 per cent. Then the seeds are kept in the seed cleaner to remove dust particles, stones, mud clods and other metal objects in order to prevent damage to the parts of the expeller as well as to obtain pure edible oil. After that the seeds are fed into the oil expeller to extract oil. The expeller works on the principle of axial inner screw surrounded with pressing rings. As in traditional ghani there is no requirement of adding water into the expeller. In ghani extracted edible oils there will be traces of water is observed which causes oxidative rancidity which in turn reduces the shelf life of the edible oils, so this can be prevented by using oil expeller machines. There is no requirement of external heat application during this process, so the extracted oil is known as cold pressed oil. The process of cold pressed oil extraction is less efficient as the recovery is 45-50 per cent, 60-65 percent is de-oiled cake. The cold pressed edible oil is healthier when compared to other solvent extracted edible oil as there is application of external heat and other chemicals to extract oil. The byproduct oil cake which retains 6-8 percent of oil is an excellent source of nutrition for cattle and other ruminants.

Thus, the cold pressed oil obtained by the expeller is not fit for direct consumption as it contains seed hull and kernel pulp as impurities. The oil is subjected to filtration by the process of physical filtration by using the equipment filtration unit to remove physical impurities present in the edible oil. The process of filtration requires that the oil should be kept undisturbed for few hours to allow for the sedimentation of impurities. After this the supernatant oil is fed into the 10 tier filtration unit where all the impurities were removed.

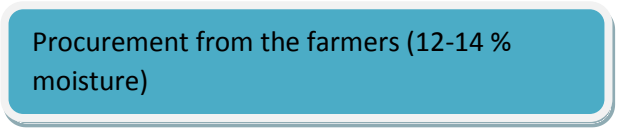
This process is repeated till the oil is obtained 100 percent pure. Then the oil obtained is packed in one litre and five litre PET bottles and the bottles were labeled for marketing.(Source: Cold pressed oil extraction unit Regional Agricultural Research Station, Jagtial, Professor JayashankarTelangana State Agricultural University, Telangana).

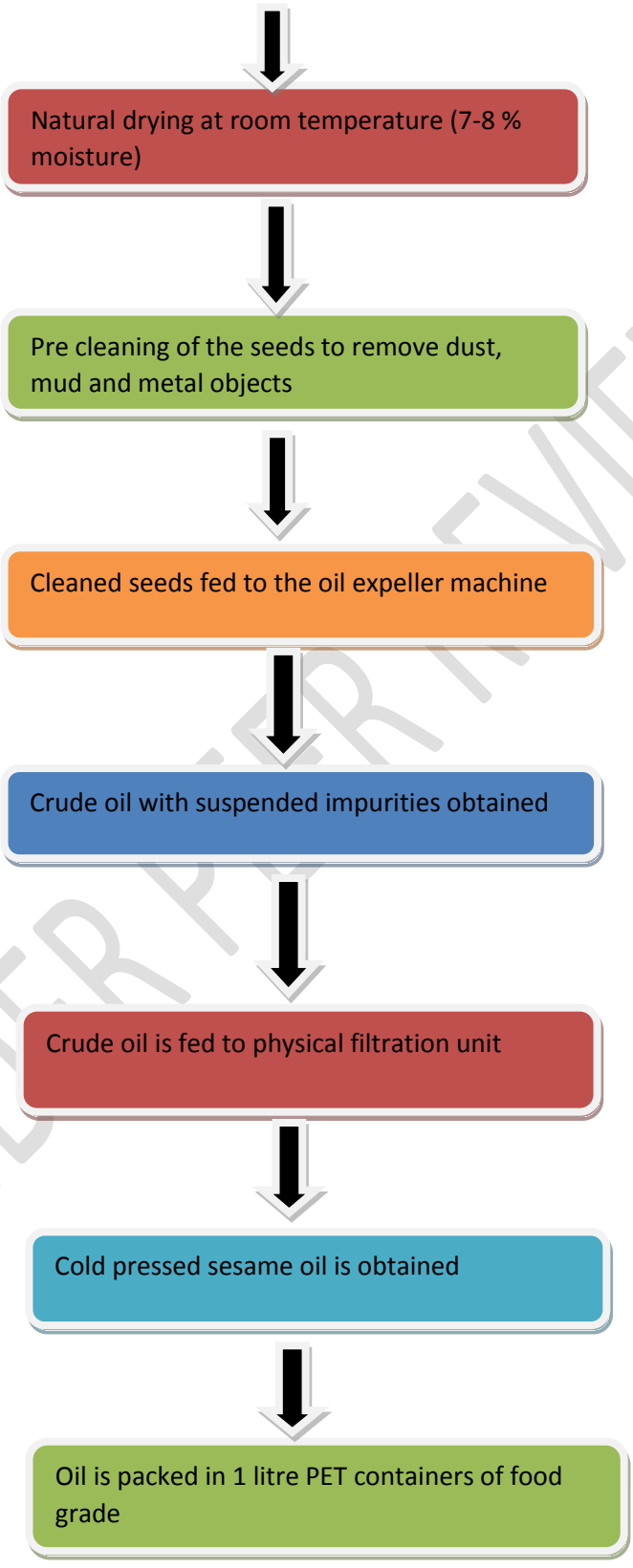
1.3.Benefits of cold pressed sesame oil

- Cold pressed sesame oil is rich in nutrition, contain all essential nutrients like vitamins, phospholipids, antioxidants and proteins.
- Cold pressed sesame oil is free from harmful chemicals like sodium, hexane, sodium bicarbonate, bleaching agents etc which are used in refined oil units.
- Cold pressed sesame oil is extracted with less heat which saves all the nutrition and contains less cholesterol.
- Cold pressed sesame oil is healthy for skin and hair and it is helpful in losing weight as it contains low cholesterol.
- Cold pressed sesame oil contains antioxidants which can prevent or delay cell damages and lower the risk of blood clots and fat deposits in the arteries.
- Cold pressed sesame oil is rich in vitamin E, boosts the immune system and is helpful in maintaining low blood sugar level.
- Now a days there is increase in awareness on health benefits of cold pressed oils and health consciousness so, there is increased demand for cold pressed oils.

(Source: Cold pressed oil extraction unit Regional Agricultural Research Station, Jagtial, Professor JayashankarTelangana State Agricultural University, Telangana).

Figure 1 Process of cold pressed sesame oil extraction





2. Methodology

2.1. Study region

The study has been conducted in the Northern Telangana Zone of Telangana state where sesame is produced and processed extensively. Northern Telangana Zone includes Adilabad, KomaramBheem, Asifabad, Nirmal, Mancherial, Nizamabad, Jagtial, Kamareddy, Rajannasiricilla and Karimnagar districts. Three major districts Jagtiyal, Nirmal, Nizamabad were selected based on the extensive coverage of Sesame processing in Northern Telangana Zone of the state.

2.2. Sampling procedure

Purposive sampling method is used to select the three districts i.e., Nizamabad, Nirmal and Jagtial were selected from Northern Telangana Zone and Random sampling method is used to select the oil units. Districts are selected based on the concentration of oil units. In each district a sample of 10 oil units are selected making a total sample of 30 oil units.

2.3. Analytical tool

Garrett's ranking technique was usedto analyze the constraints faced by farmers and oil units. The units will be asked to rank the constraints in business performance of oil units and these ranks will be converted to scores by referring Garrett's table. The order of the merit given by the respondents was changed into ranks by using the formula,

$$\text{Per cent position} = \frac{100(R_{ij} - 0.5)}{N_j}$$

Where, R_{ij}=Rank given for i_{th} item by j_{th} individual
N_j= Number of items ranked by j_{th} individual

Information regarding the problems faced by the sesame processors in processing of sesame will be collected. Constraints were identified in consultation withthe sesameprocessorswere be asked to rank the problems proposed tothem. Garrett's Ranking Technique provides thechange of orders of constraints and advantagesinto numerical scores. The prime advantage of thistechnique over simple frequency distribution isthat the constraints are arranged based on theirseverity from the point of view of respondents.Hence, the same number of respondents on two or more constraints may have been given different rank. The per cent position of each rank will be converted into scores referring to the table given by Garrett and Woodworth (1969). For each factors, the scores of individual respondents will be added together and divided by the total number of the respondents for whom scores will be added. These mean scores for all the constraints will be arranged in descending order; the constraints will be accordingly ranked. (Source: Analysis of Constraints Influencing Sorghum Farmers Using Garrett's Ranking Technique; A Comparative Study of India and Nigeria).

3. Results and Discussion

The constraints faced by the sesame processors from procurement of raw material to marketing of the final produce were analyzed by using Garrett ranking technique. The scores for each constraint have been calculated and ranks were given based on the average score obtained.

3.1.Constraints faced in unit establishment

The major problems faced by the processors at the time of unit installation were ranked based on the response given by the processors. The major problems include high rent of building, lack of technical knowhow, high cost of machinery, lack of proper power connection and cumbersome procedure for getting license.These results were collaborated from the study Identification of problems and strategies of the home based industries in Jember regency by Budy*etal.* (2016).

From table 1 it is observed that high cost of machinery has been ranked first, as the major constraint faced at the time of unit installation. High rent of building was ranked second, cumbersome procedure for getting license ranked third, problems in getting power connection ranked fourth and lack of technical knowhow ranked fifth. The processors selected for the study were educated and have experience in processing and knowledge on usage of machinery.

Table 1 Ranking of constraints faced at the time of unit installation

Sl. No	Constraint	Average Score	Rank
1	High rent of building	65.5	Ⅱ
2	Lack of technical know how	24.00	Ⅴ
3	High cost of machinery	69.50	Ⅰ
4	Problems in getting power connection	42.60	Ⅳ
5	Cumbersome procedure for getting license	47.30	Ⅲ

Source: Primary data

3.2.Constraints in financial management

Table 2. Ranking of constraints in financial management

Sl. No	Constraint	Average score	Rank
1	High rate of interest	41.46	Ⅳ
2	Insufficient funds from financial institutions	47.50	Ⅱ
3	Lack of subsidies	43.30	Ⅲ
4	High cost of repair and maintenance	75.00	Ⅰ

Source: Primary data

The constraints related financial arrangements for the establishment sesame oil units were analyzed and given ranks. The major problems faced by the processors include high rate of interest, insufficient funds from the financial institutions, lack of subsidies, high tax rate on the raw material and high cost of machinery repair and maintenance.

From the 3.2 it is interpreted that high cost for repair and maintenance ranked first among the problems related to financial arrangements and insufficient funds from financial institutions was ranked second, lack of subsidies ranked third, high rate of interest ranked fourth and high tax rate on raw material ranked fourth.

3.3.Constraints faced in procurement of raw material

The processing of sesame to obtain edible oil starts with the procurement of raw material. The major constraints faced while procuring raw material consists of lack of assured supply of raw material, high rates of raw material, lack of quality of raw material, high marketing charges and cost.

From table 3 it is interpreted that high cost of raw material has been ranked first, as the price of the raw material, sesame seed has high price per quintal. Lack of quality of raw material was ranked second, due to the presence of dust, stones, straw etc., in the seed and it requires machinery for seed cleaning which leads high investment. Lack of assured supply of raw material was ranked third, as the supply of raw material was seasonal and the availability of raw material mostly depends on the quantity produced. Higher marketing charges and costs was ranked fourth.These results were confirmed from the study The Rice processing industry in Nepal: Constraints and Analysis by Joshi *etal.* (2020).

Table 3 Ranking of constraints faced in procurement of raw material

Sl. No	Constraint	Average score	Rank
1	Lack of assured supply of raw material	52.50	Ⅲ
2	High rates of raw material	66.40	Ⅰ
3	Lack of quality of raw material	56.03	Ⅱ
4	Higher marketing charges and cost	32.50	Ⅳ

Source: Primary data

3.4.Constraints in processing of sesame

The major problems faced by the processors during processing of sesame consists of under utilization of installed capacity of unit, high rate of electricity, high working capital and lack of technical human capital. They were ranked and given in the table 4.

Table 4. Ranking of constraints in processing of sesame

Sl.no	Constraint	Average score	Rank
1	Under utilization of installed capacity of unit	56.00	Ⅱ
2	High rate of electricity	40.03	Ⅳ
3	High working capital	57.30	Ⅰ
4	Lack of technical knowledge of workers	41.50	Ⅲ

Source: Primary data

From table 4 it is observed that high working capital as major constraint faced during processing as it is ranked first due to high price of raw material and high cost for packaging. Under utilization of installed capacity of unit was ranked second, as the availability of raw material was seasonal. Lack of technical human capital was ranked third, as the workers lack knowledge on proper usage and handling of machinery while processing as it leads high cost for repairs and maintenance. High rate of electricity ranked fourth. These results are on par with the study entitled made Constraint analysis on small scale cashew nut industries in Tamilnadu by Srinivasan and Mehazabeen (2018).

3.5.Constraints in marketing of final product

The major problems related to marketing of final produce include lack of efficient market for final produce, competition from other sesame oil units, high rate of sale tax lack of awareness about the product. The ranks given by the respondents were presented in table 5.

Table 5 Ranking of constraints in marketing of final product

Sl. No	Constraint	Average score	Rank
1	Lack of efficient market to final product	46.16	Ⅲ
2	Competition from other sesame oil units	56.60	Ⅱ
3	High rate of sale tax	31.30	Ⅳ
4	Lack of awareness about the product	72.50	Ⅰ

Source: Primary data

From table 5 it is observed that lack of awareness about the product in the study area is the major constraint in marketing of the final product, as it was ranked first. It was observed that the study area has low knowledge about the benefits in consumption of sesame edible oil. Thus the processors were creating awareness about the product through pamphlets and word of mouth. Competition from other oil units was ranked second, lack of efficient market was ranked third, as it requires more investment for the processors for marketing of final product to distant locations in order to increase their sales and returns. High rate of sale tax was ranked fourth. The final product, sesame oil was sold to nearby consumers and also through online sales by few of the selected processors. These results were collaborated from the studyConstraint analysis on small scale cashew nut industries in Tamilnadu by Srinivasan (2018).

4. Conclusion

The data collected from the sesame processors in the study region was subjected to Garett ranking where different scores were given based on the rankings given by the processors for the constraints existing in procuring and processing of sesame. The study showed that the major constraints faced by the processors at different stages of processing in the study region were high cost of machinery, insufficient funds from the financial institutions, lack of quality raw material, high cost for machinery repairs and maintenance, lack of efficient market for the final product and lack of awareness about the product.

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