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Cost economics and economic viability of cold press oil extraction unit

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Abstract

The present study has been carried to study the different parameters for the establishment of cold press oil extraction unit. Calculated the production cost of cold press groundnut oil by considering all parameters and determined breakeven point of the cold press oil extraction unit at different market prices. Study revealed that, within 2 years cold press oil extraction business will achieve the breakeven point for Rs. 310 as market price. Breakeven point determination gives the clarity about all the parameters which effects on the oil extraction business establishment. Entrepreneur had been facing the different problems while establishing the unit hence efforts were taken to resolve the problems related to the cold press oil extraction unit with the efficient data and technical solutions. The mentioned study act as basic model for the start-up business entrepreneur of oil extraction unit.

Keywords: Cold press oil extraction unit, entrepreneur, production cost breakeven point

Introduction

Cold press extraction is one of the oil extraction method required less energy than other oil extraction techniques and also environmental friendly. It is used to extract oil from a range of oilseeds. High-quality oils can be obtained by performing production at low temperatures using cold press method. It has an environmentally friendly use with no solvents. In other words, the cold-press extraction does not involve either heat or chemical extraction. Moreover, these oils are interesting for consumers due to their natural and safe as well as prevent certain diseases and improve human health. These oils have better nutritive properties than refined oils. However, they have a lot of advantages; one of the disadvantages of this technique is low productivity. Another disadvantage of this technique is hard to extract same quality product.

A long cylindrical contraption known as 'ghani' was used to extract oil from oilseeds. However, a new technique known as cold pressing technique was introduced in 1983. Cold-pressed technique is a method of extracting oil from oilseeds such as sesame, olive and coconut. Cold pressing technique avoids heat generation by controlled temperature setting and enhances the taste of the oil. It also retains the subtle colour and nutritional value of the extracted oil. Oil extracted through this process do not contain added chemicals or any types of preservatives and hence, is considered to be more healthy. The method is also eco-friendly and does not cause any harm to the environment. At the same time, the meal from cold-pressing technology possesses higher nutritional value. Based on above benefits, cold-pressing technology is an ideal method for oil extraction. Even so, cold-pressing technology still has some problems, for instance low oil yield and high residual oil rate which need to be investigated further.

Estimation of cost economics is beneficial for the improvement of particular business. It helps for the entrepreneur to take decision regarding the investment and marginal cost. The objective of the current study was to make detailed cost estimation for the cold press oil extraction unit to use these as a basic for estimating the required budget and costing of oil that would allow a cold press oil extraction unit efficiently. This information will benefit individuals and organizations in the planning stages for oil extraction unit. The particular study is beneficial for the afterwards problem which could be happen after establishment.

Methods

Detailed financial and expenses records for 6 months were collected from running oil extraction plant at Krushi Vigyan Kendra, Akola. All expenses were categorized by Cost A,

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cost B and Cost C viz as actual cost, percent depreciation and invisible cost respectively. All the cost was considered while calculating the cost economics such as raw material, packaging and labelling, electricity, manpower and other expenses.

For the detailed study of problems occurred after the establishment of cold press extraction unit organised the dissuasion session of entrepreneurs of cold press oil extraction unit and collected the data in terms of measure and minor problems. With the help of technical expertise tried to resolve their problems.

In the study of cost economics we assumed as the oil extraction plant is running for six months, 24 days per month with 4 batches per day. The cost was considered according to the wholesale price at Akola market for the raw material i.e. groundnut.

Result and Discussion

1. Production cost

Table 1 summarizes the expenses for the production of cold pressed groundnut oil respectively with the determination of cost at breakeven point according to the data collected from the Krushi Vigyan Kendra, Akola. Also, determined the cost at which cold pressed oil business will be at economically viable stage with the basic model. The calculations summarised according to the assumptions and the average recovery data obtained.

According to the data by Krushi Vigyan Kendra, Akola it is found that the recovery of groundnut oil and deoiled cake is 40 % (vl/wt) and 57.6 % respectively. Expenses for the production of 1 litre of cold pressed groundnut oil determined as Rs. 265.1.

Table 1: Total production cost for groundnut oil

Particulars	Quantity of material required (for 6 months)	Rate of the material required	Expenditure
Cost A (actual cost)			
Raw material cost	8640 kg	95 Rs/kg	820800
Packaging material cost	3456 bottles and labels	8 Rs/bottle	27648
Electricity	1728 units	16.96 Rs/unit	29306.88
Labour cost	156 days	515 Rs/day	80340
Cost B (indirect cost)			
Percent machinery depreciation	10% of the cost of machinery	for 6 months	9440
Cost C (indirect cost)			
Supervisor cost	156 days	469 Rs/day	73164
Total cost (Cost A + Cost B + Cost C)			1040698.88
Total production cost for groundnut oil (excluding the cost of defiled cake)			301.13
Obtained deoiled cake	4976.64 kg	25 Rs/Kg	124416
production cost for 1 litter of groundnut oil (including the cost of defiled cake)			265.13

2. Breakeven point

Every entrepreneur needs information on whether the business would give the returns on their total investments. A number of tools are available for seeking such information. One of such tool is the use of breakeven point analysis which determines the viability of an investment, this point is the level of production volume at which the total revenue equals the total expenses there is no net loss or gain. In determining the Break Even Point, the investor needs to consider at least three variables these are the total fixed costs, the selling price per unit and the variable cost per unit. This analysis is an important tool that allows for comparative studies between costs, revenues and profits. (Nwachukwu, 2004 [3] and Pappas 1981) [4].

To determine the breakeven point of the cold press oil production business considered the fixed cost (Table 2)

which included investment for machinery and construction. Breakeven point is determined for different market price of the cold press oil, the difference between the market cost and production cost of the product known as contribution margin, is directly proportional to the quantity of production at breakeven point which is summarised in Table 3.

Table 2: Total fixed assets cost for oil extraction unit

Particulars	Expenditure
Machinery	
Oil extraction unit	188800
Filter press	65000
Weighing balance	9440
Utensils	14000
Construction	240000
Total fixed assets cost	517240

Table 3: Breakeven point at different market price for cold press oil

Quantity of production at Breakeven point =	Fixed assets cost			
	Market cost – variable (production) cost			
Market cost (Rs.)	280	290	300	310
Production quantity at breakeven point (litter/unit)	34780	20797	14833	11528

Results revealed that with increase in contribution margin reaches the breakeven point earlier. At Rs 300 per liter can get the breakeven point at 14833 units/liter. Which means after the production of 11528 units/liter of oil business get the breakeven point at Rs. 310 per liter? If the particular entrepreneur sells the 500 liter of oil per month he can achieve the breakeven point in 23 months. Determination of breakeven point is useful to know about the changes in

duration to achieve breakeven point if the company alters the price of a product.

Measure problems

We contacted the start-up business entrepreneur who found that the business of cold press oil is not economically viable or they need to shut it down due to some reasons. As per the data collected by discussing with entrepreneur problems

were categorised into measure and minor problems which are represented as below.

A. Measure Problems

1. **Oil recovery:** The oil recovery or the yield from the raw material as is less as compared to hot pressed and refined extraction technique. Less recovery of oil directly effects on the consumption of manpower, electricity and increases the production cost.
2. **Spoilage of DOC:** Deoiled cake is the by-product obtained after oil extraction from the raw material. If the oil from the raw material is not properly extracted it causes the formation of fungus on the deoiled cake while storage. In the monsoon season deoiled cake gets spoiled faster.
3. **Market demand of oil:** Peoples are not aware about the benefits of cold press oil. Most of the people don't know the cold press oil concept.
4. **High price of oil:** Production cost per unit gets higher which impacts adversely on the consumer.

B. Minor Problems

1. **Processing losses:** (a) Extraction of oil is done manually which not gives the uniform yield. (b) In each processed batch some quantity of deoiled cake has highest oil content which needs to be discarded. (c) While filtering the oil is get adhered to filter cloths and washing causes loss of oil.
2. **Handling losses:** Oil adhered on filter press, storage tanks and utensils gets wasted while cleaning and filling of bottles.
3. **Technical problem:** After the long duration of storage it causes the settlement of sediments at the bottom of oil bottle which is natural process.
4. **Space requirement:** 60 % of by-product is obtained from the raw material which needs more space for storage than the processing unit.
5. **Market demand for deoiled cake:** Peoples are continually using the cottonseed deoiled cake as animal feed and similar to the cold press oil people are not awarded about the deoiled cake and its benefits.
6. **Marketing linkage:** Only the rich society demands for the cold press oil.
7. **Financial problem:** For starting the business needs more investment for machinery and construction.

Suggestions

After discussing with the entrepreneur we observed that they had the valid reasons or problems to shut down their business. Hence, we visited the different oil extraction unit for relevant study and observed that with some precautions and technical solutions can run the unit in economically viable stage.

1. To maintain the uniformity in the oil recovery need to use the same variety of raw material with high oil content and skilled staff for oil extraction.
2. Deoiled cake (by-product) obtained from the oil extraction unit should be dried up to optimum moisture content level at which fungal growth can be avoided. Sun drying is feasible to removal the moisture.
3. Arrange the awareness sessions of people aware them about the benefits of oil and also try settle their misassumptions regarding oil settlement.
4. Target mostly the educated and health conscious people

to increase the sale of the cold pressed oil.

5. Give training to the manpower for better improvement in the yield and minimise the processing and handling losses.
6. Free sample distribution of deoiled cake for trial purpose may work feasible for increasing the sale of deoiled cake.
7. Production of different type of cold press oil e.g. Coconut and sesame oil helps to cover the all type of market.
8. For the filtration of cold press oil use the sedimentation process which helps to reduce the cost in initial investment.

Summary and Conclusion

The data obtained from Krishi Vigyan Kendra, Akola is utilised for the determination of production cost of 1 litre of cold pressed groundnut oil by considering all the parameters. The costing is considered in terms of direct and indirect cost which includes the factors such as manpower, electricity, raw material, machinery depreciation and packaging material. Determination of production cost shows that selling of deoiled cake gives the profit. It was concluded that, the production cost for the 1 liter of oil is Rs. 265.12 excluding the price of groundnut deoiled cake (by-product).

Determined production cost and fixed assets cost is considered for the evaluation of breakeven point for the cold press oil extraction unit. Study revealed that the at different market prices breakeven point will be achieved at different quantity of production. Breakeven point also reached soon by increasing the production. It gives the clear idea about when the business will reach to the no loss no profit i.e. breakeven point. For the particular unit at Krushi Vigyan Kendra, Akola breakeven point is reached in 23 months with the production of 500 litre of oil per month.

The discussion sessions organised at Krushi Vigyan Kendra ranked the problems according to the ranking as measure and minor problems. With efforts suggested the technical resolutions for the ranked problems. Conclusion to this study, it gives the solution on over all problems which helps entrepreneur to take the decisions while starting the business. The present findings could be applied as basic model to start up and run the oil extraction business in the efficient manner.

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