

# STABILISED RICE BRAN

QUALITY AND STANDARDS : To yield edible oil as per PFA specifications.  
PRODUCTION CAPACITY : 525 tpa



## 1.0 PRODUCT AND ITS APPLICATIONS

India imports edible oil to partly meet the domestic demand. The need for alternate sources of edible oil is always felt. The oil present in rice bran to the extent of 15-20% is a promising source. More than 5 million tonnes of rice bran available annually can yield about 7 lakh tonnes of oil.

The rice bran when exposed to damp atmosphere readily absorbs moisture. The lipase enzyme present in the bran becomes very active and splits the oil into free fatty acids (FFA), making oil unfit for refining and edible purpose. It has been found that freshly extracted rice bran, when heated or treated with acid, keeps well without increase in FFA and edible rice bran oil can be obtained from this stabilised bran. Suitable rice bran stabiliser has been developed at CFTRI. It is a simple process of chemical stabilisation which can be applied in the rice mills specifically in the rural areas to quickly stabilise bran using commercially available hydrochloric acid to lower the pH and inactivate the enzyme.

## 2.0 MARKET POTENTIAL

Stabilised bran can be stored for longer periods and is used for extraction of edible oil. About 7-8 lakh tonnes of edible oil can be produced, if FFA development in the bran is arrested effectively. At present most of the rice bran oil produced is being used as industrial grade, because of high FFA. The deoiled bran is largely used in animal feeds. The edible oil fetches higher prices and adds to the availability of edible oil in the country.

## 3.0 BASIS AND PRESUMPTIONS

- The unit proposes to work at least 300 days per annum on single shift basis.
- The wages for skilled workers is taken as per prevailing rates in this type of industry.
- Interest rate for total capital investment is calculated @ 12% per annum.
- The entrepreneur is expected to raise 20-25% of the capital as margin money.
- The unit proposes to construct own building.
- Costs of machinery and equipment are based on average prices enquired from machinery manufacturers.

## 4.0 IMPLEMENTATION SCHEDULE

Project implementation will take a period of 8 months. Break-up of the activities and relative time for each activity is shown below:

❖ Scheme preparation and approval	:	01 month
❖ SSI provisional registration	:	1-2 months
❖ Sanction of financial supports etc.	:	2-5 months
❖ Installation of machinery and power connection	:	6-8 months
❖ Trial run and production	:	01 month

## 5.0 TECHNICAL ASPECTS

### 5.1 Availability of Raw material

The total production of rice in our country is more than 90 million tonnes. At 8% degree of milling, we have the total potential of about 72 lakh tonnes of rice bran. There are hullers, shellers, huller-cum-shellers and modern or modernised rice mills distributed all over the country. Hence raw material is available in abundant quantity.

### 5.2 Process of Manufacture

The principle of the process lies in shifting the pH of the bran to the level where the lipase activity would be negligible. This is achieved by using commercially available hydrochloric acid, adjusting the pH to 4.0 at which the activity of enzyme is nearly zero. To achieve complete inactivation of the enzyme system, 40 litres of commercial concentrated hydrochloric acid is required for 1 tonne of bran. The process is simple involving spraying of hydrochloric acid on the bran in drum and mixing the lot for 4 min. The mixing is done in a paddle type mixer, which is provided with an arrangement for spraying of acid from top continuously. Stabilisation of bran by manual mixing in an open pan or on clean surface is also possible for small lots. As the acid does not remain in free state, the treated bran does not affect the contact parts.

### 5.3 Location

It is pertinent that the rice is stabilised immediately after polishing. The plant can be set up at a central location wherein the rice mills could bring the bran within a short time. The ideal situation would be to set it up as added processing activity within existing rice mills.

**5.4 Quality Control and Standards:** To yield the oil meeting the PFA specifications for edible rice bran oil.

## 6.0 POLLUTION CONTROL

There is no major pollution problem associated with this industry except for disposal of waste which should be managed appropriately. The entrepreneurs are advised to take "No Objection Certificate" from the State Pollution Control Board.

## 7.0 ENERGY CONSERVATION

Since no heating is involved in the process, no fuel is required.

## 8.0 PRODUCTION CAPACITY

Quantity	:	525 tpa
Value	:	Rs. 13.12 lakh
Installed capacity	:	2 tpd
Working days	:	300/annum
Manpower	:	4
Optimum capacity utilization	:	70%
<b>Utilities</b>		
Motive Power	:	5 kW
Water	:	2 kL/day

## 9.0 FINANCIAL ASPECTS

### 9.1 Fixed Capital

#### 9.1.1 Land & Building Amount (Rs. lakh)

Land 500 sq.m.	:	0.75
Built up Area 100 sq. m. @ 2500	:	2.50
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Total cost of Land and Building	:	3.25

#### 9.1.2 Machinery and Equipment

Description		Amount (Rs. lakh)
Mixer with motor, spraying device with compressor and epoxy coated tanks.	:	4.00
Erection & electrification @10% cost of machinery & equipment	:	0.40
Office furniture & fixtures	:	0.35
Total	:	----- 4.75

#### 9.1.3 Pre-operative Expenses

Consultancy fee, project report, deposits with electricity department etc.	:	0.50
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#### 9.1.4 Total Fixed Capital 8.50 (9.1.1+9.1.2+9.1.3)

### 9.2 Recurring expenses per annum

#### 9.2.1 Personnel

Designation	No.	Salary Per month	Amount (Rs.lakh)
Factory Manager	1	7000	0.84
Unskilled workers	3	1500	0.54
	4		1.38

#### 9.2.2 Raw Material including packaging materials

Particulars	Qty.(MT) Per mt.	Rate (Rs. lakh)	Amount
Only servicing	525	1000	5.25
Commercial Hydrochloric acid	21	6000	1.25
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<b>Total:</b>			<b>6.50</b>

<b>9.2.3 Utilities</b>	<b>Amount (Rs. lakh)</b>
Power 5 kW	0.24
Water 600 kL	0.01
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<b>Total:</b>	<b>0.25</b>
<b>9.2.4 Other Contingent Expenses</b>	<b>Amount (Rs. lakh)</b>
Repairs and maintenance@10%	0.53
Insurance	0.05
Others	0.42
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<b>Total:</b>	<b>1.00</b>
<b>9.2.5 Total Recurring Expenditure</b>	<b>Amount (Rs. lakh)</b>
(9.2.1+9.2.2+9.2.3+9.2.4)	9.13
<b>9.3 Working Capital</b>	
One month Recurring Expenditure	0.76
<b>9.4 Total Capital Investment</b>	<b>Amount (Rs. lakh)</b>
Fixed capital (Refer 9.1.4)	8.50
Working capital (Refer 9.3)	0.76
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<b>Total:</b>	<b>9.26</b>

## 10.0 FINANCIAL ANALYSIS

<b>10.1 Cost of Production (per annum)</b>	<b>Amount (Rs. lakh)</b>		
Recurring expenses (Refer 9.2.5)	9.13		
Depreciation on building @5%	0.12		
Depreciation on machinery @10%	0.44		
Depreciation on furniture @20%	0.07		
Interest on Capital Investment @12%	1.04		
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<b>Total:</b>	<b>10.80</b>		
<b>10.2 Sale Proceeds (Turnover) per year</b>			
<b>Item</b>	<b>Qty. (MT)</b>	<b>Rate per MT</b>	<b>Amount (Rs.lakh)</b>
Stabilized bran	525	2500	13.12
Packed in 1kg PET jars			

### 10.3 Net Profit per year

= Sales - Cost of production

= 13.12 - 10.80

= Rs. 2.32 lakh

### 10.4 Net Profit Ratio

=  $\frac{\text{Net profit} \times 100}{\text{Sales}}$

=  $\frac{8.54 \times 100}{63.84}$

= 13.4%

### 10.5 Rate of Return on Investment

=  $\frac{\text{Net profit} \times 100}{\text{Capital Investment}}$

=  $\frac{8.54 \times 100}{17.3}$

= 49%

### 10.6 Annual Fixed Cost

Amount (Rs. Lakh)

All depreciations	0.56
Interest	2.04
40% of salary, wages, utility, contingency	2.93
Insurance	0.07
<b>Total:</b>	<b>5.60</b>

### 10.7 Break even Point

=  $\frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Fixed Cost} + \text{Profit}}$

=  $\frac{5.6 \times 100}{5.6 + 8.54}$

= 560 / 14.14

= 40%

## 11.0 ADDRESSES OF MACHINERY AND EQUIPMENT SUPPLIERS

Sree Siddavinayaka Machinery & Equipment  
Site No. 10, 3<sup>rd</sup> Stage  
Industrial Suburb, Mysore – 570 008

Mysore Industries  
2336, 9<sup>th</sup> Cross  
Basaveshwara Road, Mysore – 560 004

Sathana Industries  
A-3, Industrial Estate  
Krishnagiri – 635 001, Tamilnadu

Nalanda Agro Works  
Industrial Estate Road, Kurji  
Patna – 800 011, Bihar

S.K.Engineering & Allied Works  
Bahraich – 271 801