

# FISH PROCESSING



## 1.0 INTRODUCTION

Fish is a highly perishable item and reportedly, bulk of the catch is sun-dried after salt curing which is certainly an unhygienic process. However, with steadily growing market, it has become imperative to process scientifically for better shelf life as well. Kerala, Goa, Maharashtra, Gujarat, Orissa, Tamil nadu, West Bengal and Karnataka are the leading states where sea fish is available in plenty. The location has to be in close proximity of sea and major consumer centres must also be kept in mind. Apart from domestic market, there are good export possibilities as well but this note aims only at domestic market.

## 2.0 PRODUCT

### 2.1 Applications

Fish and prawns are very popular amongst non-vegetarians and many delicacies including some snacks are made from fish. Availability of fresh fish is generally confined to the coastal areas and hence popularity of ready to serve fish and prawn products is increasing.

### 2.2 Availability of know-how and Compliances

DFRL, Mysore, has successfully developed the technical know-how. Compliance under PFA Act is mandatory.

## 3.0 MARKET POTENTIAL

Fish is a popular non-vegetarian variety and many delicious food and snack items are prepared from fish & prawns. Number of non-vegetarians is growing steadily. Fish is a highly perishable item and salt curing and sun-drying method of processing is not only unhygienic but also imparts limited shelf life. Fresh fish is available only near the coastal areas and consumers at other locations get processed varieties. Apart from individual households, fish is

regularly consumed in restaurants, canteens, clubs etc. Flight kitchens and caterers is another important segment. The Defence Purchase Department of the Govt. of India is a major bulk consumer. There are many varieties which can be processed like tuna, prawn, pomfret, mackerel and so on. Apart from institutional supplies, retailing can be undertaken with proper placement in the departmental stores, super bazars, shopping malls etc.

#### 4.0 MANUFACTURING PROCESS

After cleaning fish in water, certain items like head, fins, tail etc. are removed and remaining parts are washed in water again to remove blood, dirt etc. Then they are cut and packed in sterilised tins. They are canned with tomato sauce, brine or oil. In case of prawns, after washing and cleaning meat is blanched in 3 to 5% brine for 8-10 minutes and then pieces are canned. Then these cans are subjected to live steam in the exhaust box at a temperature of around 80-90° C for 15-20 minutes. Exhausted cans are immediately sealed air tight and treated in retort at a pressure of 10 to 15 lbs for 30 to 90 minutes. Pressure and processing time depends upon size of cans and products. Cans taken out from retort need to be cooled as early as possible. The net yield is around 65%.

#### 5.0 CAPITAL INPUTS

##### 5.1 Land and Building

A plot of land of around 250 sq.mtrs. with built up area of 125 sq.mtrs. can accommodate processing equipments. Washing and cleaning (dressing) can be undertaken outside the main building with asbestos sheet roofing and water tanks. Land may cost Rs.75,000/- whereas cost of construction is assumed to be Rs. 3.50 lacs including washing area.

##### 5.2 Machinery

To install annual rated capacity of 200 tonnes with 330-340 days and around 12 hours working, following machines shall be needed:

Item	Qty.	Price (Rs.)
Oil-fired Boiler	1	1,25,000
Autoclave complete with pressure gauges, safety valves, electricals etc.	1	60,000
Double-seamer complete with all accessories	1	70,000
SS Make blanching tank with steam heating pipe etc.	1	25,000
Straight line type exhaust box complete with heating pipe, reduction gear, electricals etc.	1	90,000
Straight-line type exdhaust box complete with heating pipe, reduction gear, electricals etc.	1	90,000
Canning Retort	1	70,000
Can reformer with flanger	1	80,000
SS Vessels, weighing-scales, cooling tanks, laboratory instruments, etc	--	1,00,000
	<b>Total</b>	<b>6,20,000</b>

### 5.3 Miscellaneous Assets

Other assets like furniture & fixtures, storage racks, plastic crates and tubs, SS utensils, office equipments, packing tables etc. shall be needed for which a provision of Rs. 1.50 lacs is made.

### 5.4 Utilities

Total power requirement shall be 60 HP whereas boiler would need oil. Everyday water requirement would be 5000 ltrs.

### 5.5 Raw and Packing Materials

The all-important raw material would be good quality fresh fish & prawns. Tomato sauce or edible oil or brine shall be needed in small quantity. Empty cans of suitable size, lables, cartons, box strapping etc. shall be the packing material.

## 6.0 MANPOWER REQUIREMENTS

Particulars	Nos.	Monthly Salary (Rs.)	Total Monthly Salary (Rs.)
Machine Operators	2	3,000	6,000
Skilled Workers	2	2,500	5,000
Semi-skilled Workers	4	1,750	7,000
Helpers	4	1,250	5,000
Salesman	1	2,500	2,500
		<b>Total</b>	<b>25,500</b>

## 7.0 TENTATIVE IMPLEMENTATION SCHEDULE

Activity	Period (in months)
Application and sanction of loan	2
Site selection and commencement of civil work	2
Completion of civil work and placement of orders for machinery	6
Erection, installation and trial runs	2

## 8.0 DETAILS OF THE PROPOSED PROJECT

### 8.1 Land and Building

Particulars	Area (Sq.Mtrs)	Cost (Rs.)
Land	250	75,000
Building	125	3,50,000
	<b>Total</b>	<b>4,25,000</b>

## 8.2 Machinery

The total cost of machinery is estimated to be Rs. 6.20 lacs as explained earlier.

## 8.3 Miscellaneous Assets

The total cost under this head is likely to be Rs. 1.50 lacs as stated before.

## 8.4 Preliminary & Pre-operative Expenses

There will be many pre-production expenses like registration, establishment and administrative charges, travelling, consultation, interest during implementation, trial runs etc. for which an amount of Rs.1.25 lacs is provided for.

## 8.5 Working Capital Requirements

At 60% capacity utilisation in the first year, the working capital needs shall be as under:

(Rs. in lacs)

Particulars	Period	Margin	Total	Bank	Promoters
Stock of Packing Materials	1 Month	30%	1.30	0.90	0.40
Stock of Finished Goods	½ Month	25%	3.80	2.85	0.95
Receivables	½ Month	25%	5.20	3.90	1.30
Other Expenses	1 Month	100%	0.50	--	0.50
		<b>Total</b>	<b>10.80</b>	<b>7.65</b>	<b>3.15</b>

## 8.6 Cost of the Project & Means of Financing

(Rs. in lacs)

Item	Amount
Land and Building	4.25
Machinery	6.20
Miscellaneous Assets	1.50
P&P Expenses	1.25
Contingencies @ 10% on Land and Building & Plant & Machinery	1.05
Working Capital Margin	3.15
<b>Total</b>	<b>17.40</b>
<b>Means of Finance</b>	
Promoters' Contribution	5.10
Term Loan from Bank/FI	12.30
<b>Total</b>	<b>17.40</b>
Debt Equity Ratio	2.31 : 1
Promoters' Contribution	29%

Financial assistance in the form of grant is available from the Ministry of Food Processing Industries, Govt. of India, towards expenditure on technical civil works and plant and machinery for eligible projects subject to certain terms and conditions.

## **9.0 PROFITABILITY CALCULATIONS**

### **9.1 Production Capacity & Build-up**

As against the annual rated of 200 tonnes, the plant is expected to operate at 60% in the first year and 75% thereafter.

### **9.2 Sales Revenue at 100%**

The selling price would largely depend upon the variety of fish/prawns. But on an average, it is taken as Rs.160/- per kg. or Rs. 1.60 lacs per ton. Assuming 65% yield, the total sales at 100% would be Rs. 208.00 lacs.

### **9.3 Raw and Packing Materials Required at 100%**

Price of fresh fish/prawn would differ from variety to variety but average price is taken as Rs.60,000/- per ton and thus total cost of 200 tonnes would be Rs. 120.00 lacs and other materials would cost around Rs.6.00 lacs. Cost of packing materials would be Rs.12,000/- per ton of finished goods or Rs.15.60 lacs. Thus, total raw and packing materials cost at 100% would be Rs.141.60 lacs.

### **9.4 Utilities**

Annual cost of utilities at 100% would be Rs.3.00 lacs.

### **9.5 Selling Expenses**

A provision of 20% of sales income is made to take care of expenses like selling commission, transportation, publicity, free sampling etc.

### **9.6 Interest**

Interest on term loan of Rs. 12.30 lacs is computed @ 12% per annum assuming repayment in 5 years including a moratorium period of 1 year whereas on working capital loan from bank it is calculated @ 14% per annum.

### **9.7 Depreciation**

It is calculated @ 10% on building & 15% on machinery & miscellaneous assets on WDV basis.

## 10.0 PROJECTED PROFITABILITY

(Rs. in lacs)

No.	Particulars	1st Year	2nd Year
<b>A</b>	<b>Installed Capacity</b>	--- 200 Tonnes ---	
	Capacity Utilisation	60%	75%
	Sales Realisation	124.80	156.00
<b>B</b>	<b>Cost of Production</b>		
	Raw and Packing Materials	84.96	106.20
	Utilities	1.80	2.25
	Salaries	3.06	3.60
	Stores and Spares	0.60	0.80
	Repairs & Maintenance	0.75	0.90
	Selling Expenses @ 20%	24.96	31.20
	Administrative Expenses	0.72	1.00
	<b>Total</b>	<b>116.85</b>	<b>145.95</b>
<b>C</b>	<b>Profit before Interest &amp; Depreciation</b>	<b>7.95</b>	<b>10.05</b>
	Interest on Term Loan	1.32	1.07
	Interest on Working Capital	1.07	1.35
	Depreciation	1.50	1.30
	Profit before Tax	4.06	6.33
	Income-tax @ 20%	0.81	1.27
	Profit after Tax	3.25	5.06
	Cash Accruals	4.75	6.36
	Repayment of Term Loan	--	2.75

## 11.0 BREAK-EVEN ANALYSIS

(Rs. in lacs)

No	Particulars	Amount	
<b>[A]</b>	<b>Sales</b>		<b>124.80</b>
<b>[B]</b>	<b>Variable Costs</b>		
	Raw and Packing Materials	84.96	
	Utilities (70%)	1.26	
	Salaries (70%)	2.15	
	Stores & Spares	0.60	
	Selling Expenses (70%)	17.50	
	Admn Expenses (50%)	0.36	
	Interest on WC	1.07	<b>107.90</b>
<b>[C]</b>	<b>Contribution [A] - [B]</b>		<b>16.90</b>
<b>[D]</b>	<b>Fixed Cost</b>		<b>10.44</b>
<b>[E]</b>	<b>Break-Even Point [D] ÷ [C]</b>		<b>62%</b>

## 12.0 [A] LEVERAGES

### Financial Leverage

$$\begin{aligned} &= \text{EBIT/EBT} \\ &= 6.45 \div 4.06 \\ &= 1.59 \end{aligned}$$

### Operating Leverage

$$\begin{aligned} &= \text{Contribution/EBT} \\ &= 16.90 \div 4.06 \\ &= 4.16 \end{aligned}$$

### Degree of Total Leverage

$$\begin{aligned} &= \text{FL/OL} \\ &= 1.59 \div 4.16 \\ &= 0.38 \end{aligned}$$

## [B] Debt Service Coverage Ratio (DSCR)

(Rs. in lacs)

Particulars	1st Yr	2nd Yr	3rd Yr	4th Yr	5th Yr
Cash Accruals	4.75	6.36	6.73	7.08	7.39
Interest on TL	1.32	1.07	0.74	0.42	0.22
<b>Total [A]</b>	<b>6.07</b>	<b>7.43</b>	<b>7.47</b>	<b>7.50</b>	<b>7.61</b>
Interest on TL	1.32	1.07	0.74	0.42	0.22
Repayment of TL	--	3.10	3.10	3.10	3.00
<b>Total [B]</b>	<b>1.32</b>	<b>4.17</b>	<b>3.84</b>	<b>3.52</b>	<b>3.22</b>
<b>DSCR [A] ÷ [B]</b>	<b>4.60</b>	<b>1.73</b>	<b>1.94</b>	<b>2.00</b>	<b>2.35</b>
<b>Average DSCR</b>	----- <b>2.52</b> -----				

**[C] Internal Rate of Return (IRR)**

Cost of the project is Rs. 17.40 lacs.

(Rs. in lacs)

Year	Cash Accruals	20%	24%	28%	32%
1	4.75	3.96	3.83	3.71	3.60
2	6.36	4.41	4.13	3.88	3.65
3	6.73	3.90	3.53	3.21	2.93
4	7.08	3.41	2.99	2.64	2.33
5	7.39	2.97	2.52	2.15	1.85
	<b>32.31</b>	<b>18.65</b>	<b>17.00</b>	<b>15.59</b>	<b>14.36</b>

The IRR is around 23%.

**Some of the machinery and Packing Materials suppliers are**

1. T Alimohammed & Co, MJ Phule Market, Mumbai 400 003
2. Raylon Metal Works, JB Nagar, Andheri (E), Mumbai 400 059
3. Techno Equipments, 31, Parekh Street, Girgaon, Mumbai 400 004
4. Container Industries, C-299, Ghatkopar Industrial Estate, 72, LBS Marg, Mumbai-400080.