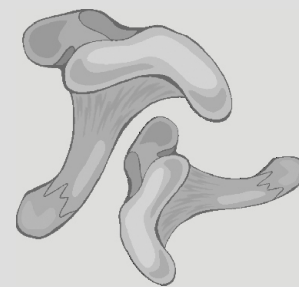


# MUSHROOM PROCESSING



## 1.0 INTRODUCTION

Mushrooms are gradually becoming popular as they are rich in minerals and vitamins and very low on fat and sugar. Fresh mushrooms have very limited life and hence they need to be consumed within few hours. But processing and canning increases their shelf life to few months. Mushrooms are used to make soups, pickles, vegetables etc. and they are also used as additives in many food preparations. As a matter of fact, they are considered as a vegetarian delicacy all over the world and their consumption is increasing in India as well. Their household use is picking up but they are consumed in large quantities in star hotels and restaurants. Hence, firm tie-up with some of them is advisable.

## 2.0 PRODUCT

### 2.1 Applications

Mushroom is an exotic and nutritious source of vegetarian food and is also easy to digest. It is considered as a suitable substitute for meat and eggs. There are many varieties of mushroom and most of them are edible. It is a universal product and UP has been considered as a likely location.

### 2.2 Availability of know-how and Compliances

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

## 3.0 MARKET POTENTIAL

Mushrooms are very popular in most of the developed countries and they are becoming popular in many developing countries like India. Applications and market for mushrooms is growing rapidly in India because of their nice aroma, nutritious values, subtle flavour and

special taste. Many exotic food preparations like soup, vegetables, pickles etc. are made from them. They are also used for garnishing, to prepare many varieties of gravy and for stuffing several food preparations. But they are still considered as up-market product and their consumption is limited to urban and semi urban areas. Fresh mushrooms have very limited shelf life but processed and canned mushrooms have fairly long shelf life and can be sold even at far off places. Star hotels, exclusive restaurants, certain caterers are the bulk consumers and a firm tie-up for regular supply with some of them is advisable. The product can be sold even through departmental stores, super markets etc.

#### 4.0 MANUFACTURING PROCESS

Fresh mushrooms are washed in cold water and then blanched in boiling water for around 3-4 minutes. Then they are dehydrated in drier and packed. It is advisable to pre-treat fresh mushrooms in a solution containing brine to prevent discolouration. Packing is very critical as formation of moisture contaminates mushrooms very quickly. Hence plain cans and brine of 2% salt and 0.2% citric acid are used for packing. The cans are exhausted at 19° C for 7-8 minutes, sealed and processed under pressure for around half an hour. Yield of final product depends up on the quality of dryer, manufacturing process employed, moisture content in fresh mushrooms and moisture required in the final product. Hence, average yield is taken at 25%.

#### 5.0 CAPITAL INPUTS

##### 5.1 Land and Building

Land measuring around 200 sq.mtrs. with built-up area of about 100 sq.mtrs. is adequate. Land may cost Rs. 60,000/- whereas cost of construction could be Rs. 2.50 lacs.

##### 5.2 Machinery

A thorough market survey would help to arrive at the proposed processing capacity. Assuming daily capacity of 1 ton or annual capacity of 300 tonnes considering 300 working days would require following machines:

Item	Qty.	Price (Rs.)
Baby Boiler	1	60,000
Tray-type Dehydrator	1	70,000
Can Seamer	1	20,000
Can Reforming with Rubber Rollers, Hand Flanger etc.	1	25,000
Exhaust Box with electric Motor	1	15,000
Steam Jacketted Kettle	1	30,000
Weighing Scales	2	5,000
Laboratory Equipments	--	25,000
	<b>Total</b>	<b>2,50,000</b>

### 5.3 Miscellaneous Assets

Some other support assets like furniture and fixtures, storage racks, packing tables, SS utensils etc. shall be required for which a provision of Rs. 40,000/- is made.

### 5.4 Utilities

The power requirement will be 30 HP and everyday water requirement shall be 1000 ltrs.

### 5.5 Raw and Packing Materials

The most crucial raw material will be good quality fresh mushrooms. Shelf life of fresh mushrooms is few hours and hence the location has to be very close to the cultivation area. Prior arrangements with some cultivators for regular supply must be made. Future planning may include mushroom cultivation for captive consumption. Salt and citric acid will be required in small quantities. Cans of appropriate size, lables and corrugated boxes would form packing materials.

## 6.0 MANPOWER REQUIREMENTS

Particulars	Nos.	Monthly Salary (Rs.)	Total Monthly Salary (Rs.)
Skilled Workers	2	2,250	4,500
Helpers	4	1,250	5,000
Salesman	1	2,500	2,500
		<b>Total</b>	<b>12,000</b>

## 7.0 TENTATIVE IMPLEMENTATION SCHEDULE

Activity	Period (in months)
Application and sanction of loan	2
Site selection and commencement of civil work	1
Completion of civil work and placement of orders for machinery	4
Erection, installation and trial runs	1

## 8.0 DETAILS OF THE PROPOSED PROJECT

### 8.1 Land and Building

Particulars	Area (Sq.Mtrs)	Cost (Rs.)
Land	200	60,000
Building	100	2,50,000
	<b>Total</b>	<b>3,10,000</b>

## 8.2 Machinery

Machinery worth Rs. 2.50 lacs shall be required as discussed earlier.

## 8.3 Miscellaneous Assets

A provision of Rs. 40,000/- is adequate under this head as explained earlier.

## 8.4 Preliminary & Pre-operative Expenses

A provision of Rs. 60,000/- is made towards pre-production expenses like market assessment, registration, establishment and administrative charges, interest during implementation, trial runs, etc.

## 8.5 Working Capital Requirements

As against the processing capacity of 300 tonnes, the plant is expected to run at 60% in the first year which would call for following working funds:

(Rs. in lacs)

Particulars	Period	Margin	Total	Bank	Promoters
Stock of Packing Material	1 Month	30%	0.65	0.45	0.20
Stock of Finished Goods	1 Month	25%	1.50	1.15	0.35
Receivables	1 Month	25%	2.05	1.50	0.55
Other Expenses	1 Month	100%	0.30	--	0.30
		<b>Total</b>	<b>4.50</b>	<b>3.10</b>	<b>1.40</b>

## 8.6 Cost of the Project & Means of Financing

(Rs. in lacs)

Item	Amount
Land and Building	3.10
Machinery	2.50
Miscellaneous Assets	0.40
P&P Expenses	0.60
Contingencies @ 10% on Land and Building & Plant & Machinery	0.55
Working Capital Margin	1.40
<b>Total</b>	<b>8.55</b>
<b>Means of Finance</b>	
Promoters' Contribution	2.55
Term Loan from Bank/FI	6.00
<b>Total</b>	<b>8.55</b>
Debt Equity Ratio	2.33 : 1
Promoters' Contribution	30%

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 rated processing capacity of 300 tonnes, capacity utilisation in the first year is assumed to be 60% and thereafter 75%.

### 9.2 Sales Revenue at 100%

(Rs. in lacs)

Product	Qty. (Tonnes)	Price/Ton (Rs.)	Sales Value
Tinned Mushrooms	75	55,000	41.25

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

(Rs. in lacs)

Product	Qty. (Tonnes)	Price/Ton (Rs.)	Value
Fresh Mushrooms	150	12,000	18.00
Salt, Citric Acid etc.	--	--	0.60
Cans	1,76,500	Rs.3/Tin	5.30
Cartons, Labels etc.	--	--	2.50
		<b>Total</b>	<b>26.40</b>

### 9.4 Utilities

Expenditure on utilities at 100% activity level would be Rs.80,000/-.

### 9.5 Selling Expenses

It is advisable to enter into long term supply arrangements in bulk. This would reduce packing expenses considerably apart from savings in the commission to be paid to retailers. Hence, average selling expenses are considered to be 7.5% of total sales.

### 9.6 Interest

Interest on term loan of Rs 6.00 lacs is computed @ 12% per annum assuming repayment in 3½ years including a moratorium period of 6 months whereas it is computed @ 14% per annum on working capital loan from bank.

### 9.7 Depreciation

It is calculated on WDV basis @ 10% on building and 20% on machinery and miscellaneous assets.

## 10.0 PROJECTED PROFITABILITY

(Rs. in lacs)

No.	Particulars	1st Year	2nd Year
<b>A</b>	<b>Installed Capacity</b>	-- 150 Tonnes --	
	Capacity Utilisation	60%	75%
	Sales Realisation	24.75	30.95
<b>B</b>	<b>Cost of Production</b>		
	Raw and Packing Materials	15.85	19.80
	Utilities	0.48	0.60
	Salaries	1.44	1.65
	Stores and Spares	0.15	0.24
	Repairs & Maintenance	0.18	0.36
	Selling Expenses @ 7.5%	1.85	2.30
	Administrative Expenses	0.48	0.60
	<b>Total</b>	<b>20.43</b>	<b>25.55</b>
<b>C</b>	<b>Profit before Interest &amp; Depreciation</b>	<b>4.32</b>	<b>5.40</b>
	Interest on Term Loan	0.61	0.40
	Interest on Working Capital	0.43	0.54
	Depreciation	0.83	0.69
	Profit before Tax	2.45	3.77
	Income-tax @ 20%	0.50	0.75
	Profit after Tax	1.95	3.02
	Cash Accruals	2.78	3.71
	Repayment of Term Loan	0.90	1.80

## 11.0 BREAK-EVEN ANALYSIS

(Rs. in lacs)

No	Particulars	Amount	
[A]	Sales		<b>24.75</b>
[B]	Variable Costs		
	Raw and Packing Materials	15.85	
	Utilities (70%)	0.35	
	Salaries (70%)	1.00	
	Stores & Spares	0.15	
	Selling Expenses (70%)	1.30	
	Admn Expenses (50%)	0.24	
	Interest on WC	0.43	<b>19.32</b>
[C]	Contribution [A] - [B]		<b>5.43</b>
[D]	Fixed Cost		<b>2.98</b>
[E]	Break-Even Point [D] ÷ [C]		<b>55%</b>

## 12.0 [A] LEVERAGES

### Financial Leverage

$$= \text{EBIT/EBT}$$

$$= 3.49 \div 2.45$$

$$= 1.42$$

### Operating Leverage

$$= \text{Contribution/EBT}$$

$$= 5.43 \div 2.45$$

$$= 2.22$$

### Degree of Total Leverage

$$= \text{FL/OL}$$

$$= 1.42 \div 2.22$$

$$= 0.64$$

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

(Rs. in lacs)

Particulars	1st Yr	2nd Yr	3rd Yr	4th Yr
Cash Accruals	2.78	3.71	4.02	4.31
Interest on TL	0.61	0.40	0.14	0.06
<b>Total [A]</b>	<b>3.39</b>	<b>4.11</b>	<b>4.16</b>	<b>4.37</b>
Interest on TL	0.61	0.40	0.14	0.06
Repayment of TL	1.00	2.00	2.00	2.00
<b>Total [B]</b>	<b>1.61</b>	<b>2.40</b>	<b>2.14</b>	<b>2.06</b>
<b>DSCR [A] ÷ [B]</b>	<b>2.25</b>	<b>1.87</b>	<b>2.14</b>	<b>3.94</b>
<b>Average DSCR</b>	----- <b>2.55</b> -----			

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

Cost of the project is Rs. 8.55 lacs.

(Rs. in lacs)

<b>Year</b>	<b>Cash Accruals</b>	<b>24%</b>	<b>28%</b>	<b>32%</b>
1	2.78	2.24	2.17	2.11
2	3.71	2.41	2.26	2.13
3	4.02	2.11	1.92	1.75
4	4.31	1.82	1.61	1.42
	<b>14.82</b>	<b>8.58</b>	<b>7.96</b>	<b>7.41</b>

The IRR is around 24%.

**Some of the machinery and packing material suppliers are:**

1. Nagpal Brothers, C-127, Phase II, Mayapuri Industrial Area, New Delhi-110064  
Tel No. 25400407/02631
2. SP Engg Works, PB No. 218, Kanpur
3. Lyalpur Engg. Co, PB No. 8, Gaziabad
4. Cowel Can Ltd., PO Barotiwala, Dist. Solan, HP