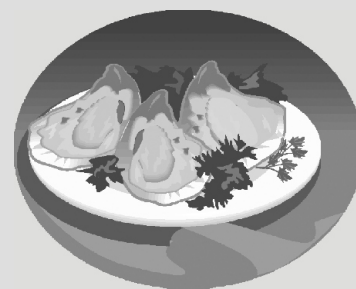


# OYSTER MUSHROOMS



## 1.0 INTRODUCTION

Mushroom is an exotic source of vegetarian food. Most of its varieties are edible and form a tasty and nutritious diet. They are rich in vitamins like C & D and also contain minerals like iron, copper, calcium, phosphate and potassium. It is an excellent balanced diet. There are two varieties of mushrooms viz. button mushrooms and oyster mushrooms. Of these, oyster mushrooms are relatively easy to grow and atmospheric conditions of some locations of Maharashtra are suitable to this variety. Mushroom cultivation is still in the unorganised sector with very few organised sector units.

## 2.0 PRODUCT

The cultivated mushrooms, *Agaricus Bisporus*, are a major horticultural crop worldwide but it is essentially a monocrop. It is a fungal saprophyte plant considered a delicacy world over. Mushrooms are a very rich source of vitamins as well as minerals. This product can be cultivated anywhere in the country and this note considers Maharashtra as the preferred location in view of ever increasing demand.

**2.1 Compliance with the PFA Act is mandatory.**

## 3.0 MARKET POTENTIAL

Mushroom is a vegetarian delicacy and is a suitable substitute for meat and eggs. Besides, it is easily digestible and liked by vegetarians. It is full of vitamins and minerals and is very effective in many diseases. It has already acquired commercial status in developed countries and now many developing economies have also accepted it. There is a growing market for mushrooms because of their subtle flavour, nice aroma, special taste and food value. Number of preparations is made from them like soup, vegetables, pickles etc. Powder of dry mushroom is used as tonic in combination with milk and boiled water. However, market for mushrooms

is still confined to big cities and hence the mushroom cultivation unit has to be close to some big city. Mushrooms have very short life of just few hours after harvesting and therefore they are sold mainly in fresh form in big cities to star hotels, exclusive restaurants, and clubs or to the processing units. It is, therefore, imperative to undertake thorough market survey before finalising location and capacity.

#### 4.0 PROCESS OF CULTIVATION

For successful cultivation, careful attention has to be paid to three aspects viz. good compost, reliable spawn and right temperature during growing period or else partial or complete failure of the crop may result. Natural compost is prepared from horse dung and wheat or barley straw. Some quantity of chicken manure and 3 kgs. urea per ton of compost may be added. Compost preparation is very crucial and advise from an expert may be taken. Mushrooms are grown in wooden trays or boxes of 100 cm x 50 cm x 15 cm. They are filled well with the compost and pressed firmly leaving 3 cm clear space on top of the tray. The grain spawn is scattered on the surface of the compost which is then covered with a thin layer of compost. After that the trays are covered with old newspaper sheets and water is sprayed to provide humidity. The trays are then stacked vertically. At a temperature of around 24 - 25° C white cottony mycelium spreads and premeates through the compost. It takes around 12 to 15 days for the complete spawn running. Ultimately, the surface of the compost is covered with half to one inch level of casing soil. It is sterilised to kill insects, nematodes and molds. The casing soil is spread over plastic sheets and treated with formalin and stirred frequently for a week to remove formation fumes. After casing, the temperature has to be maintained at 24-25° C for 3 days after which it must be lowered to 18° C. Thus, batches of trays must be arranged in such a way that there is a regular daily production. To enhance their shelf life, mushrooms are dehydrated.

#### 5.0 CAPITAL INPUTS

##### 5.1 Land and Building

Land admeasuring about 200 sq.mtrs. with built-up shed of 100 sq.mtrs. is enough. Cost of land would be Rs. 60,000/- whereas cost of civil work would be Rs. 2.50 lacs.

##### 5.2 Plant and Machinery

It is advisable to start mushroom cultivation on a moderate scale of 350 kgs. a day with 300 working days. The annual capacity would be 105 tonnes. This would call for following set up:

Item	Qty.	Price (Rs.)
Stacking Trays	250	1,00,000
Deep Freezers	2	60,000
Weighing Scale	1	10,000
Bag Sealing Machine	2	8,000
Laboratory Equipments	--	20,000
	<b>Total</b>	<b>1,98,000</b>

### 5.3 Miscellaneous Assets

Other assets like furniture and fixtures, storage facilities, working tables, shall be required for which a provision of Rs.40,000/- is made.

### 5.4 Utilities

The total power requirement will be 15 HP whereas daily water requirement will be about 1000 ltrs.

### 5.5 Raw Materials

Raw materials like spawn, wheat or barley straw, formaline, insecticides etc. shall be required and their availability should not be a bottleneck. Packing bags shall also be required in small quantity.

## 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	300	60,000
Building	150	2,50,000
	<b>Total</b>	<b>3,10,000</b>

### 8.2 Machinery

As spelt out earlier, the total cost of machinery would be Rs. 1.98 lacs.

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

(Rs. in lacs)

Product	Qty.	Price (Rs.)	Value
Spawn	10,000 Kgs	Rs.55/Kg	5,50,000
Wheat/Barley Straw	--	--	2,40,000
Formaline	--	--	36,000
Insecticides	--	--	40,000
Packing Materials	--	--	2,50,000
		<b>Total</b>	<b>11,16,000</b>

### 9.4 Utilities

Cost of utilities at 100% activity level is taken at Rs.75,000.

### 9.5 Interest

Interest on bank finance for working capital of Rs.40,000/- is calculated @ 14% per annum. Interest on term loan of Rs. 4.68 lacs is calculated @ 12% per annum assuming repayment in 3½ years including a moratorium period of 6 months.

### 9.6 Depreciation

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

### 8.3 Miscellaneous Assets

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

### 8.4 Preliminary & Pre-operative Expenses

A provision of Rs.70,000/- is made towards market survey, registration, establishment and other charges, technical consultation, interest during implementation etc.

### 8.5 Working Capital Requirements

Due to typical nature of raw materials and perishable nature of finished goods, it is assumed that the bank would grant post-sales facilities of Rs. 50,000/- with margin of Rs.10,000/-.

### 8.6 Cost of the Project and Means of Financing (Rs. in lacs)

Item	Amount
Land and Building	3.10
Machinery	1.98
Miscellaneous Assets	0.40
P&P Expenses	0.70
Contingencies @ 10% on Land and Building & Plant & Machinery	0.50
Working Capital Margin	0.10
<b>Total</b>	<b>6.78</b>
<b>Means of Finance</b>	
Promoters' Contribution	2.10
Term Loan from Bank/FI	4.68
<b>Total</b>	<b>6.78</b>
Debt Equity Ratio	2.21 : 1
Promoters' Contribution	31%

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 capacity of 105 tonnes, actual utilisation is assumed to be 60% in the first year and 75% thereafter.

### 9.2 Sales Revenue at 100%

Assuming selling price of Rs. 20,000/- per ton, the annual sales at 100% would be Rs. 21.00 lacs.

## 10.0 PROJECTED PROFITABILITY

(Rs. in lacs)

No.	Particulars	1st Year	2nd Year
<b>A</b>	<b>Installed Capacity</b>	-- 105 Tonnes --	
	Capacity Utilisation	60%	75%
	Sales Realisation	12.60	15.75
<b>B</b>	<b>Cost of Production</b>		
	Raw and Packing Materials	6.70	8.37
	Utilities	0.45	0.56
	Salaries	1.44	1.65
	Repairs & Maintenance	0.36	0.48
	Selling Expenses	0.42	0.60
	Administrative Expenses	0.30	0.42
	<b>Total</b>	<b>9.67</b>	<b>12.08</b>
<b>C</b>	<b>Profit before Interest &amp; Depreciation</b>	<b>2.93</b>	<b>3.67</b>
	Interest on Term Loan	0.43	0.29
	Interest on Working Capital	0.06	0.08
	Depreciation	0.73	0.61
	Profit before Tax	1.71	2.69
	Income-tax @ 20%	0.34	0.53
	Profit after Tax	1.37	2.16
	Cash Accruals	2.10	2.77
	Repayment of Term Loan	0.70	1.40

## 11.0 BREAK EVEN ANALYSIS

(Rs. in lacs)

No	Particulars	Amount	
<b>[A]</b>	<b>Sales</b>		<b>12.60</b>
<b>[B]</b>	<b>Variable Costs</b>		
	Raw and Packing Materials	6.70	
	Utilities (65%)	0.29	
	Salaries (65%)	0.94	
	Selling Expenses (70%)	0.30	
	Admn Expenses (50%)	0.15	
	Interest on WC	0.06	<b>8.44</b>
<b>[C]</b>	<b>Contribution [A] - [B]</b>		<b>4.16</b>
<b>[D]</b>	<b>Fixed Cost</b>		<b>2.45</b>
<b>[E]</b>	<b>Break-Even Point [D] ÷ [C]</b>		<b>59%</b>

## 12.0 [A] LEVERAGES

### Financial Leverage

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

$$= 2.20 \div 1.71$$

$$= 1.29$$

### Operating Leverage

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

$$= 4.16 \div 1.71$$

$$= 2.43$$

### Degree of Total Leverage

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

$$= 1.29 \div 2.43$$

$$= 0.53$$

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

(Rs. in lacs)

Particulars	1st Yr	2nd Yr	3rd Yr	4th Yr
Cash Accruals	2.10	2.77	3.12	3.46
Interest on TL	0.43	0.29	0.15	0.08
<b>Total [A]</b>	<b>2.53</b>	<b>3.06</b>	<b>3.27</b>	<b>3.54</b>
Interest on TL	0.43	0.29	0.15	0.08
Repayment of TL	0.80	1.60	1.60	0.68
<b>Total [B]</b>	<b>1.23</b>	<b>1.89</b>	<b>1.75</b>	<b>0.76</b>
<b>DSCR [A] ÷ [B]</b>	<b>2.24</b>	<b>1.81</b>	<b>2.11</b>	<b>4.02</b>
<b>Average DSCR</b>	----- <b>2.55</b> -----			

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

Cost of the project is Rs. 6.78 lacs.

(Rs. in lacs)

Year	Cash Accruals	16%	18%	20%	24%
1	2.10	1.81	1.78	1.75	1.69
2	2.77	2.06	1.99	1.92	1.80
3	3.12	2.00	1.90	1.81	1.63
4	3.46	1.91	1.79	1.67	1.46
	<b>11.45</b>	<b>7.78</b>	<b>7.46</b>	<b>7.15</b>	<b>6.58</b>

The IRR is around 22%.

**Machines are available with**

1. Raylon Metal Works, JB Nagar, Andheri(E), Mumbai 400 059
2. G R Engg. Works Pvt Ltd, Worli, Mumbai 400 018
3. Techno Equipment, 31 Parekh Street, Girgaum, Mumbai-400004