CANNED MUSHROOM (EXPORT ORIENTED)

PRODUCT CODE	:	No Code is available for canned mushroom. However, Code is available for canned and bottled vegetables. The Code is 2026030008.
QUALITY AND STANDARDS	:	The Fruit Products Order, 1955 and Prevention of Food Adulteration Act, 1954 certification are mandatory. Canned mushroom must conform to the specifications laid down in Fruit Products Order. The ISO 9000/IS 14000 Certification would be necessary for exporting to European Markets.
PRODUCTION CAPACITY	:	**Can Size** — **Qty.** — **Value (Rs. in Lakhs)** A 2.1/2 — 9 Lakh cans — 445.50
MONTH AND YEAR OF PREPARATION	:	December, 2002
PREPARED BY	:	Office of the Development Commissioner (Small Scale Industries) Nirman Bhavan, New Delhi-110011

INTRODUCTION

Mushroom, a fungus fruit body, is considered a delicious food all over the world because of its taste aroma and structure. It is full of nutrients, low in calories, high in proteins, Vitamins, Minerals and a rich source of folic acid. It is an alternate choice for weight conscious people and anaemic patients. It has 4.9% protein content which is more than cow milk, green vegetables such as beans, etc.

Mushrooms are highly perishable commodity and should be marketed and consumed as soon as possible after harvest because of their high moisture content (90.92%). However, its shelf-life can be enhanced for a larger period by way of processing. Generally mushrooms are processed-frozen, dried and canned.

This project profile has been prepared for canning of mushrooms for a 100% Export-Oriented Unit. The Agricus bisporus (White button) type of mushroom is suitable and preferred for commercial canning.

Some of the benefits for Export-Oriented Units are mentioned below:—

1. The unit may import free of duty capital goods, raw materials, components prototypes, office equipments and consumables for office equipments, material handling equipments, etc.

2. An Export Oriented Unit/Export Processing Zone (EOU/EPZ) Unit may export goods manufactured through an Export House/Trading House/Star Trading House.
3. Foreign equity upto 100% is permissible in case of EOUs and EPZ units.
4. EOU/EPZ units will be eligible for concessional rent for lease of industrial plot and standard design factory building sheds.
5. EOUs/EPZ units will be exempted from payment of corporate income tax for a block of five years during the first eight years of operations.
6. Net foreign exchange earned by an EOU/EPZ unit can be clubbed with the net foreign exchange of its parent/associate company in the domestic tariff area for the purpose of according Export House, Trading House or Star Trading House status later.

MARKET POTENTIAL

It has been estimated that the export market of canned mushrooms in the world trade is about US $1000 million. The world trade of mushroom is expected to reach a staggering figure of US $ 15 billion by next 5 years. The present global demand of mushroom is about 115,000 tonnes per annum. It is also estimated that the gap between the demand and supply of mushroom in the world market is around 25 lakh tonnes. The consumption of mushroom is going up at the rate of around 10% in international market. At present, China, Taiwan and Indonesia are the main producers of mushroom products which also capture the major share of world market. Over 50% of the total world production of the mushroom, is sold in fresh form, mainly in producers' domestic markets. The balance is processed i.e. dried, frozen, canned etc. It has also been estimated that 50% of the mushrooms for processing are canned.

The major importing countries are Germany, U.S.A., Canada, Japan, Australia, etc. In India, present production is around 30000 M.T. As per the information available from APEDA (2001–2002), 15897 M.T. of Mushroom of the value of Rs. 72,47,54,829 is exported. Total export is divided into two categories i.e. Fresh Mushroom 1,17,97,631 Kg, Value Rs 51,05,30,325 and prepared and preserved 40,99,258 kg, value Rs. 21,42,24,504 which is a very negligible figure as compared to the world share.

BASIS AND PRESUMPTIONS

1. This project is based on single shift and 300 working days in a year.
2. To run the unit viably throughout the year, the other fruits and vegetables can be canned with the same machinery and equipments whenever mushroom is not available.
3. The yield of canned mushroom has been considered as 60% based on fresh mushroom. The drain weight of canned mushroom has been taken as 440 gms. in each A-2-1/2 can.
4. The cost of machinery and equipments/materials indicated refers to a particular make and the prices are approximate to those prevailing at the time of preparation of this profile.

5. The cost of packaging, forwarding, tax, etc., is taken @ 10% of the cost of machinery and equipments.
6. The cost of installation and electrification is taken @ 10% of the cost of machinery and equipments.
7. Non-refundable deposits-project cost, trial production, FPO fees, etc., are considered under pre-operative expenses.
8. Depreciation has been taken on:
   (i) Building @ 5%, and
   (ii) Plant and Machinery @ 20%.
9. Interest on total capital investment has been taken @ 14% per annum.
10. Minimum 40% of the total investment is required as margin money.
11. Pay back period of the project will be 7 years with yearly instalments.
12. Break-even Point has been calculated on the full capacity utilization.
13. For smooth functioning of the unit, it is suggested that unit should have own arrangements for cultivation of mushroom for consistency and regular availability of quality raw materials.
14. Mushroom cuttings/stems can be utilized for preparation of mushroom pickles and sold in local markets to get additional profit.

IMPLEMENTATION SCHEDULE

The following steps are involved in implementation of the project:

(a) Selection of site
(b) Form of ownership
(c) Feasibility report
(d) Registration with DIC
(e) Arrangement of finance (term loan and working capital)
(f) Construction of factory shed and building
(g) Procurement of machinery and equipment
(h) Plant erection and electrification
(i) Recruitment of manpower
(j) Arrangement of raw material including packaging material
(k) Selection of marketing channel
(l) *Miscellaneous*: power and water Connection, Pollution Control Board Clearance, etc.

As it is a 100% Export Oriented Unit of canned mushroom, normally two years are required to implement the project. Efficient planning and simultaneous operations will be major factors for timely start of the production.

TECHNICAL ASPECTS

Process of Manufacture

White button mushrooms (Agarious bisporus) are preferred over other types of mushrooms for canning. Commercially, mushrooms are canned in brine. The process involves the following steps:

(a) Picking: Mushrooms are picked at button stage (cap. diameter 2-2.5 cm) by gentle hand twisting. The soil and portion carrying any microbial flora is then cut off/removed with the help of a sharp edge stainless steel knife/blade. The stalk length should preferably be kept 0.5-1 cm. long.

(b) Sorting and Grading: Diseased, damaged/bruised, shrivelled and browned mushrooms are discarded and only the healthy white and tight buttons are selected and separated into two grades i.e. cap. diameter up to 2.5 cm with compact head as 'A' and cap. diameter beyond 2.5 cm as 'B' grade.

(c) Washing: Graded mushrooms are thoroughly washed 3-4 times in cold running water to remove adhering dirt, soil, etc. without damaging or rubbing them excessively.

(d) Blanching: To inhibit enzymatic activity, blanching is necessary. It also inactivates micro-organisms and removes the air from the raw materials to achieve a satisfactory and uniform pack.

Mushrooms are blanched in boiling water for 2-3 minutes followed by immediate cooling in cold water. However, to reduce leaching losses, steam blanching is preferred, because the leaching losses in boiling water had been estimated to be about 30%.

(e) Filling of Cans: Mushrooms are commercially packed in two can sizes i.e. A-1 tall can and A-2.5. A-1 tall cans are preferred by retailers while A-2.5 cans are liked by hoteliers, exporters and other establishments.

The blanched mushrooms are filled into cans with declared drain weight i.e. 440 gms in A-2.5 can.

(f) Brining: After filling the cans with mushrooms strained hot brine solution of 2% common salt, 1% sugar and 0.05% citric acid is added upto the brim of the can. Brining adds flavour to the product, reduces processing time and enhances the shelf life of canned mushrooms.

(g) Exhausting: After brining, cans are exhausted to remove any entrapped air and other accumulated gases from the product to ensure a longer shelf life.

Cans filled with brine solution are fed to the exhaust box for a specified period of time depending upon the length of exhaust tunnel and size of container. The shorter the tunnel, the longer will be the time required for exhausting. Exhausting can also be performed by placing the filled cans in boiling water till temperature of the centre of can reaches 85 - 90° C for 1-2 mts.

(h) Seaming/Can Closing: Immediately after exhausting, cans are sealed with the help of a double seamer to get hermetically sealed container. Sealed cans are then placed in upside down position to sterilize the closed lids.

(i) Processing/Sterilization: Processing, also designated as sterilization, is an indispensable unit operation in canning. This is accomplished by processing the hermetically sealed cans at a pressure of 15 lbs PSI for a specified period of time depending upon the size of can and altitude of processing place. However, for areas like Shimla, processing time for A-2.5 size cans is recommended to be 45 minutes.

(j) Cooling: Cooling of cans is done immediately after sterilization in cold running water to room temperature in order to give an abrupt shock to the micro-organisms to get rid of their adverse activities.

(k) Labelling and Storage: The cooled cans are stored in a cool dry place and smeared with grease to remove any adhering moisture from the

can body to avoid rusting. Cans are kept at ambient temperature for 8-10 days to check any swell, leakage, puffing and other disorders before labelling.

Before the cans are exposed for sale, proper labelling is done to meet statutory requirements of Fruit Products Order, 1955, Prevention of Food Adulteration Act, 1954 and Packed Commodities (Regulation) Act, 1975.

Quality Control and Standards

The specifications of Fruit Products Order, 1955 and Prevention of Food Adulteration Act, 1954 Certification are mandatory. The canned mushrooms should conform to the specifications laid down in F.P.O. 1955.

The ISO 9000-2000, HACCP, ISO-14000 series and European norms series standards promise a frame work which may guide the entrepreneurs towards fulfilment of a commitment of quality of products.

ISO series standards are available with the Bureau of Indian Standards from their headquarters office: 9, Bahadurshah Zafar Marg, New Delhi-110002.

Production Capacity (per annum)

(a) Quantity: 9,00,000 A-2.5 size cans
(b) Value: Rs. 445.50 lakhs.

Motive Power 30 KW

Pollution Control

The entrepreneurs are advised to contact concerned State Pollution Control Board for detailed guidance in the matter.

However, the water effluent in this industry is generated during cleaning, washing, pre-treatment, blanching of raw materials. It is advisable to test the water discharge as per specifications laid down by the Bureau of Indian Standards. The provision of such treatment has been made in the profile.

Energy Conservation

Although the energy requirement is small yet some important points for conservation of energy are given below:

1. In electrical installations appropriate electric motors should be used and properly installed.
2. There should be no leakage of steam from pipe line.

FINANCIAL ASPECTS

A. Fixed Capital

i) Land and Building	Area	Rate (In Rs.)	Amount (Rs. in lakhs)
Land	1000 sq mtr	@ 250 per sq mtr	2.50
Built-up area	700 sq mtr	@ 2500 per sq mtr	17.50
Factory shed	300 sq mt.		
Raw material store:	100 sq mtr		
Finished goods store:	100 sq mtr		
Others:	200 sq mtr		
		Total	20.00

(ii) Machinery and Equipments

Sl. No.	Description	Qty.	Amount (Rs. in lakhs)
1.	S.S. Steel Tables Size-6"×3" @ Rs 13,400	2	0.268
2.	Washing machine Rotary Rod washer equipped with spray arrangement, collection tank, etc.	1	0.660
3.	Blanching equipments consisting of three S.S. tanks each of 380×1140 mm complete with two trays of size 1015 mm × 350 mm × 180 mm and the top folds of trays 30 mm × 12 mm and S.S. Steam Coil 25 mm along three sides of tank	1	0.577
4.	S.S. tilting type steam Jacketed Kettle. (Capacity 50 Gallons)	1	0.536
5.	Straight line exhaust box. Exhaust box tunnel of 3962 mm long with 2 HP Electric motor with reduction gear boxes to accommodate four cans of A-2.5 size at a time	1	0.700
6.	Canning retorts Size-810 × 915 mm and 5 mm thick with dial thermometer, pressure gauge, safety valve, etc. @ Rs 49,200 each	2	0.984
7.	Crates for canning retors @ Rs 6600 each	8	0.528
8.	Can reformer for reforming flattened can body	1	0.505
9.	Flanger with one change part Addl. change part of the above	1 1	0.538 0.140
10.	Flange rectifier	1	0.208
11.	Semi automatic can seamer Addl. Change part of above	1 1	0.850 0.145
12.	Can end embossing machine Addl. Change part for the above	1 1	1.065 0.180
13.	Water storage tanks (Plastic) Capacity 15 Kl	1	0.500
14.	Concrete tank lined with tiles size (8'×8'×3.5')	1	0.200
15.	Steam Boiler (Oil fired) capacity-500 Kgs/hr	1	3.000
16.	Wide mouthed empty plastic container @ Rs 150 each-Capacity 50 Kgs each	100	0.150
17.	Cold storage cap-2 tonnes Area 1500 cu Ft	1	1.500
18.	Can Tester pneumatically operated with two pressure cylinders and water tanks	1	0.450
19.	(a) Miscellaneous equipments such as buckets, cutting, pealing, knives, Weighing balance Trays, box streping machine, etc.	LS	0.230
	(b) Laboratory equipments such as-weighing balance, dehydrator, etc.	LS	1.000
20.	Pollution Control equipments discharge of water treatment tanks	LS	0.350
	Total		15.264
	Packing, forwarding C.S.T. and other charges @ 10%		1.526
	Erection and electrification charges @ 10%		1.526
	Cost of office equipment including almirah office furniture, computers etc.		1.000
	Total		19.316
(iii)	Pre-operative Expenses		0.750
	Total Fixed Investment (i+ii+iii)		40.066

B. Working Capital (per month)

(i) Personnel

Designation	No.	Salary	Total (Rs . in lakhs)
Administration			
Manager	1	8000	0.08
Purchase Asstt.	1	4000	0.04
Salesman	3	4000	0.12
Accountant	1	4000	0.04
Store Keeper/Clerk	1	3000	0.03
Computer Operator	1	3000	0.03
Peon	1	2000	0.02
Watchman	2	2000	0.04
		Total	0.40

Designation	No.	Salary	Total (Rs. in lakhs)
Technical			
Plant Manager	1	8000	0.08
Food Technologist	1	7000	0.07
Production Supervisor	1	4000	0.04
Skilled Workers	2	3000	0.06
Foreman	1	4000	0.04
Boiler Attendant	1	3000	0.03
Unskilled Workers	9	2000	0.18
Sweeper	1	2000	0.02
		Total	0.52
Grand Total (0.40+0.52)			0.92
		Perks @ 15%	0.138
		Total	1.058

(ii) Raw Material

Particulars	Quantity	Rate (In Rs.)	Amount (Rs. In lakhs)
1. Mushroom 'A' grade (Canning Quality)	55 tonnes	35,000 per tonne	19.25
2. Salt, Sugar, Citric Acid, Chemicals, Preservatives	L.S.		0.25
3. A-21/2 Can	75000	12.00 each	9.00
4. Carton Boxes Labels, Gums, Box	6250	15.00 each	0.94
5. Strapping etc. Wastage of canes, cartons	L.S.		0.85
6. Boxes, Labels etc.	L.S.		0.15
		Total	30.44

(iii) Utilities	Amount (Rs. in lakhs)
1. Power 30KW Units @ Rs 3 (30×8×25×0.90×3)	0.162
2. Fuel (Furnace Oil) 4000lts @ Rs 8	0.320
3. Water 500K.lts @ Rs. 1/- K.lt	0.005
Total	0.487
or Say	0.50

(iv) Other Contingent Expenses

	Particulars	Amount (Rs. in lakhs)
i)	Postage and Stationery	0.01
ii)	Consumable Stores	0.02
iii)	Repair and Maintenance	0.02
iv)	Transport Charges	0.14

	Particulars	Amount (Rs. in lakhs)
v)	Advertisement and Publicity	0.10
vi)	Insurance, Taxes, Telephone Bills, etc.	0.08
vii)	Miscellaneous	0.03
	Total	0.40

Total Recurring Expenses (per month) Rs. 32.390 lakhs

(V) Working Capital for 3 months Rs. 97.170 lakhs

Total Capital Investment		Amount(Rs. in lakhs)
i)	Fixed Capital	40.066
ii)	Working Capital (For 3 months)	97.170
	Total	137.236

MACHINERY UTILISATION

In the process of canned mushroom, the bottle-neck operation is processing in canning retorts. Efforts should be made to keep all machinery and equipments properly maintained at regular intervals for maximum utilization of machines as the process involves some manual operations also.

FINANCIAL ANALYSIS

(1) Cost of Production	Amount (Rs. in lakh)
1. Total Recuring Expenditure (per year)	388.680
2. Depreciation on Building @ 5%	0.875
3. Depreciation on Machinery and Equipment @ 10%	1.526
4. Depreciation on Office Furniture, Fixture etc. @ 20%	0.200
5. Interest on Total Investment @ 14%	19.213
Total	410.494

(2) Turnover (per year)

	Item	Qty.	Rate	Amount (Rs. in lakhs)
1.	Canned Mushrooms A-2 1/2	9,00,000	55	495.00
2.	Commission, Brokerage & Marketing Expenses		10%	(–) 49.50
			Total	445.50

(3) Net Profit per year (Rs. in Lakhs) 35.006

(4) Net Profit Ratio

$$= \frac{\text{Net Profit (per year)} \times 100}{\text{Turnover (per year)}}$$

$$= 7.86\%$$

(5) Rate of Return

$$= \frac{\text{Net Profit (per year)} \times 100}{\text{Total Investment}}$$

$$= 25.51\%$$

(6) Break-even Point

(i) Fixed Cost	Amount (Rs. In lakhs)
(a) Depreciation on machinery and equipment	1.526
(b) Depreciation on building	0.875
(c) Depreciation on office furniture and fixtures	0.200
(d) Interest on total investment	19.213
(e) Insurance	0.360
(f) 40% of salary and wages	4.416
(g) 40% of other contingent expenses	1.584
(h) Power charges	0.360
Total	28.534

(ii) Net Profit (per annum) Rs. 35.06

$$\text{B.E.P.} = \frac{28.534 \times 100}{63.54}$$

$$= 44.91\% \text{ Say } 45\%$$

Addresses of Machinery and Equipment Suppliers

1. M/s. Somani International Corporation,
   1510, Maker Chamber V,
   Nariman Point, Mumbai-400 021
2. M/s. B. Sen Berry and Company
   65/11, Rohtak Road, Karol Bagh,
   New Delhi-110005
3. M/s. Narang Corporation
   P-25, Connaught Place,
   (Below Madras Hotel,)
   New Delhi-110001
4. M/s. Raylons Metal Works
   Kondivita Lane, Post Box-17426,
   J.B. Nagar, P.O. Andheri (E),
   Mumbai-400 059
5. M/s. K.S.J. Foods and Services (P) Ltd.,
   7/87, Vishnu Prasad Mehant Road, Vile Parle, Mumbai-400 057
6. M/s. Mather and Platt (India) Ltd.
   805-806, Ansal Bhavan,
   16, Kasturba Gandhi Marg,
   New Delhi-110001.

Addresses of Raw Material and Packaging Material Suppliers

CANS

1. M/s. Cowel Can Ltd.
   Industrial Area
   Barotiwala, Distt. Solan, (H.P.)
2. M/s. Divecha Glass Industries
   249, Bal Rajeshwar Road,
   Office L.B.S. Marg, Mulund (W),
   Mumbai-400080
3. M/s. Poysha Industries Co. Ltd.
   Nehru House,
   4, Bahadurshah Zafar Marg,
   New Delhi-110002

CHEMICALS

1. M/s. S.B. Mehta and Associates
   2-B, Ganga Vihar, 94,
   Kazi Sayed, St.
   Mumbai-400003
2. M/s. Balaji Dyechem
   5, Prajulla Bhavan, 130,
   Khara Ghat Road, Dadar,
   Mumbai-400014
3. M/s. Sesu Trading Corporation
   R. No. 2, (4th Flour,) Sai Chambers,
   367-369, Narsi Natha Street,
   Mumbai-400009
4. M/s. T. Alimohammed and Co.
   144/45, Sarang Street,
   Near M.J. Phule Market,
   Mumbai-400003
5. M/s. S.S. Enterprises
   299, Katra Pera,
   Tilak Nagar, Delhi-110006
6. M/s. Devendra Cottage Industries
   Sector-22-G,
   Chandigarh
7. M/s. Citurgla Bio-Chemical Limited
   Nevelle House, Heredia Marg,
   Bellerad Estate,
   Mumbai-400038

Material Suppliers

Local Market