

PROJECT PROFILE

ON

SPIRULINA

Month & Year
Aug 2010

**PREPARED BY
TANSTIA-FNF SERVICE CENTRE
B-22, INDUSTRIAL ESTATE
CHENNAI-600032**

Supported by

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STIFTUNG **FÜR DIE FREIHEIT**

SPIRULINA

1. Introduction

Spirulina is a green algae. It is used as a natural health food; slimming nutrient; and as a natural green colouring matter. It cures anemia, diabetes, helps in healing wounds and lowers cholesterol. It is used as a protein supplement for malnourished children and adults; in feeds for poultry, cattle, pig and aquatic animals; in health foods; in medicine; in therapeutic preparations; and in sericulture and horticulture media.

2. Market

The product is being marketed through various medical shops because of its therapeutic properties. It therefore finds placement in all medical shops in towns and cities.

3. Packaging

Spirulina is packed as capsules. Around 50 or 100 capsules are packed in a bottle and sold.

4. Production capacity

- Cultivation - Three shifts, each of 8 hours duration.
- Drying - one shift of 8 hours duration.
- The yield of wet biomass per annum would be around 200 metric tonnes which on drying will yield 10 tonnes of the dried product.
- The time period required for achieving full capacity utilisation is one year.

5. Sales revenue

- With an ex-factory selling price at Rs. 900.00 per kilogram, the annual sales revenue would be Rs. 90.00 lakhs.

6. Production process outline.

The production consists of:

- Cultivation
- Harvesting
- Processing

Selected strains of algae are used for cultivation in constant agitation of water. This is an important parameter in the cultivation of spirulina. Agitation of algae culture is necessary to keep nutrients evenly dispersed and also to expose all the cells to sunlight. The algal biomass is carefully harvested using specially made filters to recover the biomass. The harvested biomass is dried using the cross flow drier. The produce obtained is in the form of flakes. It is ground in the pulveriser to get the powder of the desired mesh size. To get an optimal yield, maintenance of required nutrient level, cell density, culture depth etc., are some of the critical parameters in the process of spirulina cultivation. The yield of spirulina is expressed as grams per cubic metre per day.

7. *Quality specifications*

- Moisture - 3%
- Protein - 65%
- Fat - 7%
- Crude fibre - 9%
- Carbohydrates - 16%
- Energy - 346 K cal / 100 grams
- Mold and fungus - absent
- It should be free from any fermented odour, coliforms, salmonella and streptococci bacteria.

8. *Pollution control measures*

Not necessary as there are no pollutants or effluents.

9. *Energy conservation measures*

Common measures will do.

10. Land and construction cost for the proposed unit

Land required - 2 acres @ Rs. 1.00 lakh per acre = Rs. 2.00 lakhs.

Constructed area is 9000 square feet as follows:

SI	Description	Sq. feet
1	Cultivation Ponds 50' X 20' (5 nos)	5000
2	Process building	1000
3	Raw material store	500
4	Finished goods store	200
5	Laboratory	500
6	Administration office	500
7	Machinery spares area	300
8	Toilets	400
9	Miscellaneous area	600
10	Total	9000

Construction cost – Rs. 600 per square foot

Total cost of civil works – Rs. 54.00 lakhs

Total cost of land and civil works – Rs. 56.00 lakhs.

11. Costing of machinery and equipment

SI	Description	Rs. lakhs
1	Paddle wheel and motors – 5 nos	2.000
2	Vibratory sieve – 1 no	1.500
3	Cross flow type tray dryer – 1 no	1.500
4	Pulveriser – 1 no	0.500
5	Packing machine	1.500
6	Water treatment plant	3.000
7	Effluent treatment plant	3.000
8	Total	13.000
11	Laboratory equipment	3.000
12	Grand total machinery and equipment	16.000

12. Project cost

SI	Description	Rs. lakhs
1	Land	2.000
2	Civil works	54.000
3	Plant machinery	10.000
4	Laboratory equipment	3.000
5	Transport vehicle (Tata Ace)	3.760
6	Effluent treatment plant	3.000
7	Energy conservation equipment	0.000
8	Piping work for ponds	1.250
9	Cost of power connection	0.500
9	Cost of electrification	1.000
10	Erection and commissioning	1.000
11	Cost of machinery spares	0.200
12	Cost of office equipment	1.000
13	Deposits if any	0.000
14	Company formation expenses	0.100
15	Gestation period expenses	0.500
16	Sales tax registration expenses	0.100
17	Initial advertisement and publicity	5.000
18	Contingencies	0.500
19	Working capital margin money	2.034
20	Total	88.944

13. Working capital requirements per month

a. Salaries and wages

SI	Description	No of persons	Total salary / month (Rs. lakhs)
1	Production Manager	1	0.400
2	Production supervisor	2	0.500
3	Skilled workers	1	0.060
4	Unskilled workers	8	0.320
5	Packing workers	2	0.080
6	Administrative staff	1	0.250
7	Driver	1	0.070
8	Security	3	0.150

7	Total	19	1.830
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b. Raw material requirement per month

SI	Description	Qty (kgs)	Rate / kg (Rs)	Value (Rs. lakhs)
1	Sodium bicarbonate	2167	24.00	0.520
2	N.P.K. Fertilizer	500	27.00	0.135
3	Super Phosphate	83	20.00	0.016
4	Magnesium Sulphate	100	20.00	0.020
5	Effluent treatment chemicals	200	20.00	0.040
6	Water for ponds			0.050
2	Total raw material	3050		0.781

c. Packaging material requirement per month

SI	Description	Qty	Rate / unit (Rs)	Value (Rs. lakhs)
1	Poly propylene pouches	17000 nos	0.50	0.085
2	Cartons and straps	170 nos	40	0.068
3	Total			0.153

Total raw + packaging material = Rs. 0.0.934 lakhs

d. Utilities per month

SI	Description	Rs. lakhs
1	Power 5000 kwh @ Rs. 5.50 per unit	0.275
2	Water	0.050
3	Boiler fuel	0.000
4	Total utilities	0.325

e. Contingent expenses per month

SI	Description	Rs. lakhs
1	Rent for processing shed	0.000
2	Postage and stationery	0.010
3	Telephones, fax etc.	0.050
4	Consumable stores	0.020
5	Repairs and maintenance	0.087
6	Local transports, loading and unloading	0.200
7	Advertisement and publicity @ 20% of sales	1.333
8	Insurance	0.005
9	Sales expenses @ 1% of sales	0.066
10	Miscellaneous expenses @ 1% of sales	0.066
11	Trade incentives @ 2% of sales	0.133
12	Taxes @ 4%	0.266
13	Total contingent expenses	2.236

f. Total working capital requirement per month

SI	Description	Rs. lakhs
1	Salaries and wages	1.830
2	Raw material and packaging material	0.934
3	Utilities	0.325
4	Contingent expenses	2.236
5	Total	5.325

14. Means of finance

SI	Description	Rs. lakhs
1	Total Project Cost	88.944
2	Equity	29.352
3	Debt	59.592
4	Working capital margin money	2.034

15. Financial analysis

SI	Description	Rs. lakhs
1	Total recurring cost per year	63.900
2	Depreciation on land and building	5.600
3	Depreciation on machinery and vehicle	1.350
4	Depreciation on furnaces	0.000
5	Depreciation on moulds and fixtures	0.020
6	Depreciation on office equipment	1.000
7	Interest on long term loan @ 13.5%	8.045
8	Interest on short term borrowings@ 13.5%	0.444
9	Total cost of production	80.359

16. Turnover per year

SI	Item	Qty	Rate/unit (Rs)	Total Rs. lakhs
1	Spirulina	10000 kgs	900	90.00

17. Viability analysis

SI	Description	Value
1	Net profit before income tax (Rs. lakhs)	9.641
2	Net profit ratio	10.7%
3	Internal rate of return	14.8%
4	Break even percentage	62%
5	Debt service coverage ratio	1.864

List of machinery supplier for drying of Spirulina

1. SSP Limited, 13 Mile Stone, Mathura Road, Faridabad, Haryana; Tel : 0129 - 25277442; Fax: 0129 - 25277441