1 EGG POWDER

1.1 Introduction

The egg is the most nutritious natural product. Eggs are rich in protein, vitamins and minerals. During last three decades, the poultry industry in the country has made remarkable progress and grown into an organized and highly productive industry. Dried egg powder can be stored and transported at room temperatures. It is quite stable and has long shelf life. The manufacture of egg powder is an important segment of egg consumption. There is enough scope of an egg powder manufacturing plant, with a suitable capacity. Whole egg powder is consumed in hotels, hospitals, restaurants, and military establishment etc. It is also used in bakeries and cake mix manufacture. Dried albumen is used in cake mix manufacture, marinque powder manufacture and in candy making.

1.2 Objective

The primary objective of the model report is to facilitate the entrepreneurs in understanding the importance of setting up unit of egg powder. This model report will serve as guidance to the entrepreneurs on starting up such a new project and basic technical knowledge for setting up such a facility.

1.3 Raw Material Availability

The major raw material required is fresh eggs and the daily requirement is 20,000. Prior confirmed arrangements for this quantity are necessary. In the year 2003-04 the total egg production in the state of MP is 8962 lakh numbers.

1.4 Market Opportunities

Eggs are full of nutrients and minerals and are consumed in different forms since centuries. There was misconception that they are from non-vegetarian food category but now people at large have accepted them as a vegetarian item and their consumption is increasing year after year. Transportation of eggs is difficult as chances of breakage during transportation are higher and it is costly also. Egg powder is comparatively easier to transport and there is no question of any breakage during the transit.

1.5 Project description

1.5.1 Applications

Egg powder is one of the most common products in poultry industry in the country. Attempts have been made to prepare egg pudding also but this product has not yet been accepted by the consumers, whereas demand for egg powder is increasing year after year.

1.5.2 Availability of know how and compliances

CFTRI, Mysore, can offer the technical know-how. Compliance under the PFA Act is necessary. CFTRI, Mysore, has developed a process and the promoters may like to seek their help.

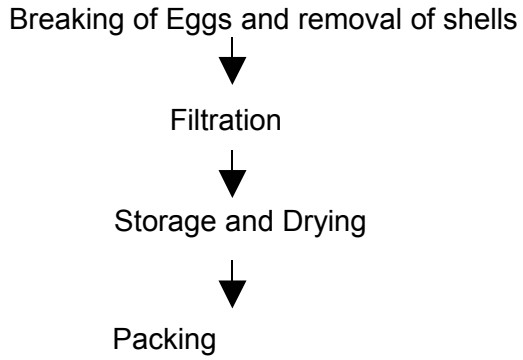
1.5.3 Capacity of the Project

240 MT per year of dry egg powder. The yield of the egg powder is around 80%.

1.5.4 Manufacturing process

Manufacture of dried egg powder starts with breaking of eggs and removing egg-shells. After removal of shells, the mixture is filtered and stored in storage tanks at about 4º C and then it is taken to tubular heater wherein it is dried at about 65º C for 8 to 10 minutes and it is filtered and passed to high pressure spray drier with the help of high pressure pump. The material which comes out of high pressure spray drier is not only in dried form but also in powder form which is then packed in poly-lined boxes. The average yield is around 80%.

A typical process flow chart would be as under:



The eggs are fed to a convectional egg breaking system. After breaking and separation of the egg and shell the whole egg is discharged into the filtration system of the process. The shells are deposited into a centrifuge where the residual liquid egg and shell are separated. After the special filtration process the egg is fed to the storage tank where it is cooled down to 40C by means of the chilled water jackets. Slow speed agitation is provided with these storage vessels.

From the storage tanks the egg is fed by a positive displacement pump to the tubular heater. This tubular heater is heated by hot water. The egg temperature is raised to 65O C. after heating the product is held at 65OC for 6 minutes gives sufficient pasteurization of the product for most situations and errs on the side of safety. Shorter holding times at 65OC are acceptable if the incoming egg quality allows this.

The warm egg from the holding tube is fed to one of the two dryer balance tanks and then to the high pressure pump by a centrifugal feeding pump. From the high pressure pump the egg is fed to the atomizing nozzles via a high pressure line. The spray dryer is cylindrical with a conical outlet for air and powder. The filtered drying air is heated by steam and then introduced to the drying chamber by a specially designed venturi. Placed in this venturei are the atomizing nozzole lances. The product is finally atomized into the hot inlet air. Due to flash drying the hot air rapidly reduces in temperature, thus giving minimum product damage. The dry powder and drying air leave the chamber at the bottom of the cone and are transported to a cyclone where the power is separated from the air. The powder is then cooled and filled into a container.

1.6 Project component and cost

Major components of the projects and their costs are described in the table hereunder:

1.7 Land and Building

Particulars	Unit	Qty	Cost/unit	Total
LAND & BUILDING				**51.50**
Land	SqM	1,000	250.00	2.50
Land Development				
Land Area		1,000	500.00	5.00
Building				
Production Block				
Main Production Area	SqM	500	5,000.00	25.00
Store cum packing room & Sales Counter	SqM	300	5,000.00	15.00
Contingencies		10%		4.00
PLANT & MACHINERY				**74.75**
Egg breaker		4	50,000	2.00
Centrifuge		2	300,000	6.00
Filter		2	100,000	2.00
Storage Tank		4	75,000	3.00
Feed Pump		2	300,000	6.00
Tubular Heater		1	800,000	8.00
Balance Tank		4	75,000	3.00
Feed Pump		2	350,000	7.00
High Pressure Pump		2	400,000	8.00
High Pressure Spray Drier		1	750,000	7.50
Cyclone with Exhaust and Fan		1	350,000	3.50
Packaging Unit		1	500,000	5.00
Electrification and Installation		-		4.00
Contingencies		15%		9.75
MISCELLANEOUS FIXED ASSETS				**6.61**
Furniture and Fixture	LS	1	100,000	1.00
Vehicles-Delivery LCV	No	2	200,000	4.00
Weighing Scale	No	1	25,000	0.25
Others	LS	1	50,000	0.50
Contingencies		15%		0.86
PRE-OPERATIVE EXPENSES				**6.90**
Establishment		1	290,000	2.90
Professional Charges		1	100,000	1.00
Security Deposits		1	300,000	3.00
TOTAL				**140**

The cost of the various components will depend on the location of the project. Item wise assumptions are as under:

1.8 Plant and Machinery

The main machineries are egg breaker, centrifuge, filter, storage tanks, feed pump, tubular heater, balance tank, high pressure pump, high pressure spray drier, cyclone with exhaust and fan etc. The total cost of plant and machinery is Rs. 74.75 lakhs.

1.9 Building

The main production block will cost around Rs. 44 lakhs. The entire building will be divided into two zones – production, storage cum packing room and sales counter.

1.10 Miscellaneous Assets

A provision of Rs. 6.61 lakhs would take care of all the requirements.

1.11 Preliminary & Pre-operative Expenses

A provision of Rs. 6.90 lakhs would take care of pre-production expenses like establishment, professional charges, security deposits etc.

1.12 Working Capital Assessment

ITEMS	Year 1	Year 3	Year 5
STOCK OF RAW MATERIAL & PACKING MATERIAL	7.38	12.31	12.31
SUNDRY DEBTORS	25.53	42.55	42.55
TOTAL	**32.91**	**54.85**	**54.85**
MARGIN	8.23	13.71	13.71
MPBF	24.68	41.14	41.14
INTEREST ON WC	2.72	4.53	4.53

1.13 Means of Finance

EQUITY CAPITAL			35.00%	**51.80**
MOFPI SUBSIDY	25%	50.00	25.00%	**37.00**
TERM LOAN				
FINANANCIAL INSTITUTIONS		9.00%	40.00%	**59.20**
-Payable half yearly Installments	10	5.90		
TOTAL			100%	**147.99**

1.14 Cash flow statement

PARTICULARS	Year 1	Year 3	Year 5	Year 7
SOURCES OF FUNDS				
EQUITY CAPITAL	-	-	-	-
SUBSIDY				
NET PROFIT	4.77	24.66	23.80	23.23
(INTEREST ADDED BACK)				
DEPRECIATION	9.79	9.79	9.79	9.79
PRELIMINARY EXP.W/O	0.99	0.99	0.99	0.99
INCREASE IN TERM LOAN	-	-	-	-
INCREASE IN BANK BORROWINGS-WC	24.68	4.11	-	-
TOTAL	**40.23**	**39.55**	**34.57**	**34.01**

1.15 Projected balance sheet

PARTICULARS	Year 1	Year 3	Year 5	Year 7
LIABILITIES				
EQUITY CAPITAL	51.80	51.80	51.80	51.80
RESERVES & SURPLUS	33.73	61.43	96.84	134.65
TERM LOAN	53.30	29.70	6.10	(0.00)
BANK BORROWINGS-WC	**24.68**	**41.14**	**41.14**	41.14
TOTAL	**163.50**	**184.06**	**195.87**	**227.59**

1.16 Profitability statement

PROFITABILITY STATEMENT				
Particulars	**Year 1**	**Year 3**	**Year 5**	**Year 7**
INCOME	93.60	144.00	144.00	144.00
EXPENDITURE	77.58	111.86	112.73	113.29
VARIABLE	58.29	86.19	85.42	84.66
FIXED	19.29	25.68	27.31	28.64
GROSS PROFIT	16.02	32.14	31.27	30.71
PROFIT BEFORE TAX	(2.85)	13.63	14.89	15.68
RETAINED PROFIT	(2.85)	13.63	14.89	15.68

1.17 Key Indicators

NET PRESENT VALUE at current Inflation (Rs. in lakhs)	154.11
INTERNAL RATE OF RETURN %	23.42
AVERAGE DSCR	2.06
BREAK EVEN POINT %	73.78
PAY BACK PERIOD (YEARS)	4.89

1.18 Man Power Requirement

PARTICULARS	NOs.
SUPERVISORY STAFF	
Production Manager	1
Machine Operators	2
Accountant	1
WORKERS	
Skilled Workers	6
Semi-Skilled Labour	4
Unskilled-Skilled Labour	10
Salesman	1
Clerk	1
TOTAL	**26**

1.19 Assumptions

Project & Financing			
Contingencies on Building			10%
Contingencies on Equipment			15%
Term Loan			40%
Rate of Interest on Term Loan			9%
Subsidy Considered	Subject to ceiling		25%
Expected time of Installation		Months	10
Moratorium		Months	6
CAPACITY			
Rated Capacity Per Annum	80% of Installed capacity	TPA	240
Number of Operational Days	DAYS		300
Working Hours Per day	Hrs		20
CAPACITY UTILIZATION			
Year I			60%
Year II			90%
Year III			100%
SALES PRICE			
W S Price			25,000
OTHER EXPENSE			
Commission			10.0%
Marketing Expenses			2.5%
POWER			
Connected Load	HP		75
DEPRICIATION AS PER COMPANY'S ACT			
BUILDING			3.34%
PLANT & MACHINERY			10.34%
MISC. FIXED ASSETS			7.07%
LAND & SITE DEVELOPMENT			1.63%
MAINTENANCE			
BUILDING			1.00%
PLANT & MACHINERY			2.00%
MISC. FIXED ASSETS			1.50%
LAND & SITE DEVELOPMENT			1.00%

1.19.1 Sources of technology

- Techno Equipments, 31, Parekh street, Girgaum, Mumbai-400004
- GR Engg. Works Pvt Ltd, Worli, Mumbai 400 018 and Apurva Engg. Works, Boriwali, Mumbai 400 098
- FMC Technologiy, Hong Kong Ltd., 2 Bhubhaneshwar Housing Soc., Pashan Rd., Pune 411008. Tel No. 25893700.
- Flavourire Foods and Services Pvt. Ltd. 208 Manas Bhavan, 11 RNT Marg, Indore 452008. Tel No. 2527644-5046500

The actual cost of projects may deviate on change of any of the assumptions.