

1 BAKING POWDER, JELLY CRYSTALS AND CUSTARD POWDER

1.1 Introduction

With increasing disposable incomes and changing life-styles, eating habits have also witnessed a definite shift. This phenomenon is no more restricted to the urban elites but it is spreading very fast to other areas as well. Thus, the contemplated products have experienced continuous increase in demand during last few years. Consistent advertising by some established manufacturers have made these products very popular across the country which would help the new entrants provided product quality is comparable and prices are competitive.

Baking Powder is a dry chemical leavening agent used in baking and deodorizing. There are several formulations; all contain an alkali, typically [sodium bicarbonate](#) (baking soda), and an [acid](#) in the form of salt crystals, together with starch to keep it dry. When dissolved in water the acid and alkali react and emit carbon dioxide gas, which expands existing bubbles to leaven the mixture.

1.2 Objective

The primary objective of the model report is to facilitate the entrepreneurs in understanding the importance of setting up unit of baking powder, jelly crystals and custard powder technology. 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

Baking powder is made from sodium bi-carbonate, edible starch and sodium aluminium sulphate whereas *jelly crystals* from sugar, fumaric acid, potassium citrate, edible gums, salt, carageena and food colours and flavours. Making of *custard powder* requires edible starch, corn flour and food colours and flavours.

Total production of sugarcane in the state is 2.148 lakh MT. the other raw materials are also available, thus the availability of raw material would not be a problem.

1.4 Suitable Location

This unit can be set in any part of the district as none of the raw material is location specific.

1.5 Market Opportunities

Last few years have witnessed overall improvement in the standard of living of people along with a definite shift in their mind set. People are willing to spend on many so-called luxurious items without bothering for future. Eating habits have also seen significant changes with traditional items being gradually replaced by convenience food items and this trend is fast spreading due to urbanisation. Fast food items, cakes and pastries, instant mixes and many such items have become extremely popular in households, restaurants, clubs, bakeries, with caterers and so on.

1.6 Project description

Applications

Baking powder is used to hold the raised batter till it is properly set while baking. It imparts uniform crumb and prevents shrinkages. Jellies are generally of 2 types viz. high solid jellies or fruit jellies and low solid or dessert jellies. Custard powder is a popular dessert item and is served with egg pudding, jelly crystals etc. These are not location specific products and can be made in Madhya Pradesh as market for these products is growing in the country.

Baking powder is most often found in [quick breads](#) like pancakes, waffles, and muffins. Generally, one teaspoon of baking powder is used to [raise](#) a mixture of one cup of flour, one cup of liquid, and one egg. However, if the mixture is acidic, baking powder's additional acids will remain unconsumed in the chemical reaction and often lend an unpleasant chemical taste to food. High acidity can be caused by ingredients like [buttermilk](#), [lemon](#), [yoghurt](#), [citrus](#), or [honey](#). When excessive acidity is present, some of the baking powder is replaced with [baking soda](#). For example, one cup of flour, one egg, and one cup of buttermilk requires only ½ teaspoon of baking powder -- the remaining leavening is caused by buttermilk acids reacting with ¼ teaspoon of baking soda.

Availability of know how and compliances

Certification under the PFA Act and FPO is required. BIS has specified quality standards vide IS 1159:1957 for Baking Powder.

Capacity of the Project

The installed capacity of the unit is 42 MT per annum.

Manufacturing process

Manufacturing process is standardized and simple. Various ingredients are dried to bring down the moisture level before grinding. Then they are mixed in the required proportion and blended thoroughly and then packed. *Baking powder* is made from *sodium bi-carbonate, edible starch and sodium aluminium sulphate* whereas *jelly crystals* from *sugar, fumaric acid, potassium citrate, edible gums, salt, carageena and food colours and flavours*. *Making of custard powder* requires *edible starch, corn flour and food colors and flavours*.

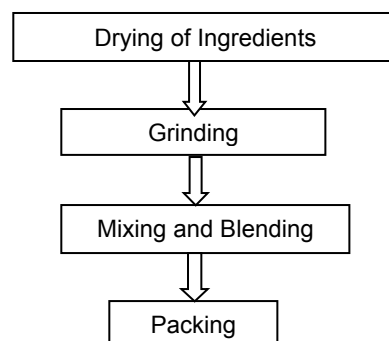
The method of production used to produce the jelly crystals is to mix sugar, gelatine, colours and flavours together and place into the ribbon mixer for approx five minutes to ensure that all ingredients are evenly distributed and blended together.

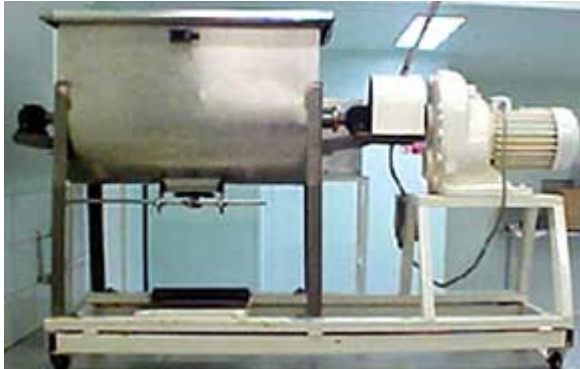
This is then discharged through the bottom outlet into a stainless steel tub set up on a roller platform and positioned close to the sachet machine. The crystals are then placed into hopper attached to the sachet machine ready for filling into sachets.

The size of the sachets are determined by the forming box fitted on machine and is capable of producing sachets with a max size up to 120mm x 120mm or as small as 50mm x 25mm and is capable of an output of 75 sachets per minute.

The machine was previously packing 55 x 44g sachets per minute containing jelly crystals in assorted colors and flavours each weighing 44g. These sachets were then placed into a pack 75mm x 120mm. The packs were then sealed by carton sealer ready to be placed into the outer shipper for distribution.

The Process Flow Chart would be as under:





Ribbon Mixer (above) is used to obtain an even distribution of the jelly mix ingredients to ensure that the finished product is of the highest quality.

Machinery Involved with the Jelly Crystal Production

1	Dry food packing room. This room is enclosed and was used to keep dry goods away from other production areas and is complete with nine double fluorescent tubes built into ceiling.
1	Stainless steel 250kg ribbon mixer, 5hp motor, on mobile frame.
1	Chiong Taiw volumetric form fill & seal sachet machine with Unimark hot foil printer.
1	Kliklok VCL carton glueing machine fitted with zenner electronic speed control.
5	Stainless steel heavy duty holding bins with lids 900 x 650mm x 25 litres (used with sachet machine).
1	Electrically powered take-off conveyor belt 3m L x 100mm W (used with sachet machine).
1	Richardson fume extraction unit complete with ducting filter, stainless steel painted hood 800mm x 800mm.
1	5Hp air condition unit.
1	Wooden platform vinyl top 2.5 x 2.1 metres (ribbon mixer stand).
1	Aucluc 4-bag dust collector.
1	Regent dual bag dust collector.
1	Dux 140 litre hot water system.
2	Stainless steel packing benches 1800mm x 600mm.
2	National ultra violet insect-o-cutors.
1	Ishida electronic digital scale (15kg).
1	Steel frame for twin tub plus basin and bench.
1	Avery balance scale (50kg).
2	Mild steel hoppers with mild steel frames (painted).

1.7 Project component and cost

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

1.8 Land and Building

PARTICULARS	Unit	Qty	Cost/unit	Total
LAND & BUILDING				13.25
Land	SqM	300	250.00	0.75
Land Development				
Land Area		300	500.00	1.50
Building				
Production Block				
Main Production Area	SqM	150	5,000.00	7.50

Store cum packing room & Sales Counter	SqM	50	5,000.00	2.50
Contingencies		10%		1.00
PLANT & MACHINERY				4.77
Micro pulveriser		1	120,000	1.20
Sifter		1	30,000	0.30
Double shaft mixer		1	75,000	0.75
electrically operated oven		1	150,000	1.50
Weighing Scale	LS	1	22,500	0.23
Contingencies		20%		0.80
MISCELLANEOUS FIXED ASSETS				2.40
Misc. Assets	LS	1	200,000	2.00
Contingencies		20%		0.40
PRE-OPERATIVE EXPENSES				5.14
Establishment		1	344,000	3.44
Professional Charges		1	50,000	0.50
Security Deposits		1	120,000	1.20
TOTAL				25.56

1.9 Plant and Machinery

The total cost of the plant and machinery is Rs. 4.77 Lakhs.

1.10 Building

The main production block will cost around Rs. 11 lakhs.

1.11 Miscellaneous Assets

A provision of Rs. 2.40 lakhs would take care of all the requirements.

1.12 Preliminary & Pre-operative Expenses

A provision of Rs. 5.14 lakhs would take care of pre-production expenses like establishment, professional charges, security deposits etc.

1.13 Working capital assessment

ITEMS	Year 1	Year 3	Year 5
STOCK OF RAW MATERIAL & PACKING MATERIAL	1.76	2.21	2.21
SUNDRY DEBTORS	5.73	7.16	7.16
TOTAL	7.49	9.36	9.36
MARGIN	1.87	2.34	2.34
MPBF	5.62	7.02	7.02
INTEREST ON WC	0.62	0.77	0.77

1.14 Means of finance

EQUITY CAPITAL			35.00%	9.60
MOFPI SUBSIDY	25%	50.00	25.00%	6.86
TERM LOAN				
FINANANCIAL INSTITUTIONS		10.00%	40.00%	10.97
-Payable half yearly Installments	10	1.10		
TOTAL			100%	27.43

1.15 Cash flow statement

PARTICULARS	Year 1	Year 3	Year 5	Year 7
SOURCES OF FUNDS				
EQUITY CAPITAL	-	-	-	-
SUBSIDY				
NET PROFIT	1.67	4.85	3.97	3.07
(INTEREST ADDED BACK)				
DEPRECIATION	1.07	1.07	1.07	1.07
PRELIMINARY EXP.W/O	0.73	0.73	0.73	0.73
INCREASE IN TERM LOAN	-	-	-	-
INCREASE IN BANK BORROWINGS-WC	5.62	0.70	-	-
TOTAL	9.09	7.35	5.77	4.87

1.16 Projected balance sheet

PARTICULARS	Year 1	Year 3	Year 5	Year 7
LIABILITIES				
EQUITY CAPITAL	9.60	9.60	9.60	9.60
RESERVES & SURPLUS	6.81	11.42	17.45	22.45
TERM LOAN	9.87	5.47	1.07	-
BANK BORROWINGS-WC	5.62	7.02	7.02	7.02
TOTAL	31.90	33.51	35.15	39.08

1.17 Projected profit and loss account

Particulars	Year 1	Year 3	Year 5	Year 7
INCOME	42.00	52.50	52.50	52.50
EXPENDITURE	38.53	45.85	46.73	47.63
VARIABLE	25.64	30.75	30.75	30.75
FIXED	12.89	15.10	15.98	16.87
GROSS PROFIT	3.47	6.65	5.77	4.87
PROFIT BEFORE TAX	(0.05)	3.36	2.92	2.30
PROFIT AFTER TAXES	(0.05)	3.36	2.92	2.30
RETAINED PROFIT	(0.05)	3.36	2.92	2.30

1.18 Key indicators

NET PRESENT VALUE at current Inflation (Rs. in lakhs)	26.32
INTERNAL RATE OF RETURN %	22.06
AVERAGE DSCR	1.86
BREAK EVEN POINT %	89.43
PAY BACK PERIOD (YEARS)	5.14

1.19 Manpower Requirement

PARTICULARS	NO.
SUPERVISORY STAFF	
PRODUCTION SUPERVISORS	2
WORKERS	
SKILLED WORKERS	2
SEMI-SKILLED LABOUR	4
SALESMAN	1

1.20 Assumptions

Contingencies on Building		10%
Contingencies on Equipment		20%
Term Loan		40%
Rate of Interest on Term Loan		10%
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	42
Number of Operational Days	DAYS	330
Working Hours Per day	Hrs	16
CAPACITY UTILIZATION		
Year I		80%
Year II		90%
Year III		100%
SALES PRICE		
W S Price		125000
OTHER EXPENSE		
Commission		7.5%
Marketing Expenses		2.5%
POWER		
Connected Load	HP	30
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		3.00%
MISC. FIXED ASSETS		2.00%
LAND & SITE DEVELOPMENT		1.00%

Sources of technology

- Archana Machinery Stores from Guwahati (Assam).
- KGN Engg., Plot No. 174, Old Airport Road, Secunderabad- 500001. Tel No. 27952147
- Rolex Tin and Metal Works, 21 Yacoob Street, Nr. JJ Hospital, Mumbai-400003.
- Tel No. 23472420/23411034
- Container Industries, C 299, Ghatkopar Industrial Estate, 72 LBS Marg, Mumbai- 400080

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