CORN AND MULTIGRAIN FLAKES

1. INTRODUCTION:

Corn flakes, or cornflakes, are a popular breakfast cereal made by toasting flakes of corn. The cereal was first created by John Harvey Kellogg in 1894 as a food that he thought would be healthy for the patients of the Battle Creek Sanitarium in Michigan where he was superintendent. The breakfast cereal proved popular among the patients and the Kellogg Company (Kellogg's) was set up to produce corn flakes for the wider public. A patent for the process was granted in 1896.With corn flakes becoming popular in the wider community, a previous patient at the sanitarium, C. W. Post, started to make rival products. Kellogg continued to experiment and various ingredients were added and different grains were used. In 1928, he started to manufacture Rice Krispies, another successful breakfast cereal. There are many generic brands of corn flakes produced by various manufacturers. As well as being used as a breakfast cereal, the crushed flakes can be a substitute for bread crumbs in recipes and can be incorporated into many cooked dishes.

2. PRODUCT & ITS APPLICATION:

Advantages of Flakes: Ready to Serve & Eat. Healthy & Energetic food, Low in Fat, Zero Cholesterol, Enriched with Minerals & Iron, Corn Flakes is manufactured keeping in mind the healthy breakfast requirements. Breakfast being an ideal meal of the day, it becomes necessary, to eat healthy in the morning. The healthy meal early in the day gives an individual mental and physical strength. These flakes have high amount of iron and vitamins. Corn flakes are a packaged cereal product formed from small toasted flakes of corn, usually served cold with milk and sometimes sugar. Since their original production, the plain flakes of corn have been flavoured with salt, sugar and malt, and many successive products with additional ingredients have been manufactured such as sugar frosted flakes and flakes. Though several other breakfast cereals are also available in the market but they are still to gain popularity.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Successful running this project does not require any specific qualification.

4. INDUSTRY LOOK OUT AND TREADS

In India and many others corn flakes are mostly taken in breakfast. Mostly it is taken with milk though it can be had in many other ways also depends one's taste. As a breakfast meal, corn flakes are soaked in milk and then taken. It is very quick meal and acts as appetizer also. Now a day's people don't like to have chapatis or paranthas in all the four meals which they have been having for long. Corn flakes are good substitute for such people. Corn flakes have very good taste. Though several other breakfast cereals are also available in the market but they are still to gain popularity. Besides the good taste, crispy nature, corn flakes are also popular because of their friable texture, blend flavour and above all the ease with which it can be prepared for consumption. Breakfast cereals may be conveniently divided into two major categories as follows: -

1. Those cereals such as oatmeal, which require cooling before they are served.
2. Those cereals, such as corn flakes, fully cooked and ready to eat.

The former class is probably about as old as civilization, since it is very likely that gruels and porridges made from crushed grains were among the first cereal foods of mankind. Prepared breakfast foods have a short and interesting history. Corn Flakes can be manufactured either of the two white or yellow corns. The only difference is that flake formed using yellow corn is more dark in color. Both types of corn are grown in India. These days, predominantly, hybrid type of yellow corn is used as raw material for the manufacture of corn flakes. The byproducts of this industry also find uses as animal feed and making of corn syrup or corn oil.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY

Corn flakes being one of most nutritious foods and is consumed as breakfast food not only in India but-elsewhere in the world. Basically, it is prepared from maize; this is the main raw material. Flavours, like sugar or salt are also added. Maize, the main raw material, is itself a corn grain. Corn flakes have very good taste. Though several other breakfast cereals are

also available in the market but they are still to gain popularity. Besides the good taste, crispy nature, corn flakes are also popular because of their friable texture, blend flavour and above all the ease with which it can be prepared for consumption. Corn Flakes can be manufactured either of the two white or yellow corns. The only difference is that flake formed using yellow corn is more dark in color. From raw corn flakes (before roasting) corn syrup can be prepared. It is prepared by removing starch from maize by soaking and treating with chemicals. It is also being used by liquor industry for manufacture of beer etc.It all began with Kellogg's entry in India with its cornflakes. It was marketed by the establishment of a 100% subsidiary as Kellogg's India, being the parent company's 30th manufacturing facility, at a total investment of USD 30mn at Taloja, near Mumbai (Maharashtra). India is considered as one of the largest market for breakfast cereals worldwide. The company was aiming at a business volume of Rs 2bn in three years' time.When Kellogg's entered India, the per capita consumption of breakfast cereals was a low 2 gm per family per annum which increased to 4.5 gm against 5 kg per annum globally.Few Indian Major Players are as under:-Bagrrys India Ltd., K C L Ltd., Kellogg India Pvt. Ltd. Mohan Meakin Ltd., Mysore Sales International Ltd., Riddhi Siddhi GlucoBiols Ltd.

6. RAW MATERIAL REQUIREMENTS

The major raw material used for the manufacture of corn flakes is **maize (hybrid yellow and white corns)**.

Maize is widely produced in all parts of the country the varieties grown are mixtures of white, yellow and purple seeds where it is largely produced by the private farms. Sugar is another raw material used for the manufacture of corn flakes. White sugar, which is used in the manufacture of corn flakes, is also available. This exhibits the presence of ample raw material. Other ingredients including cocoa powder and flavors are also available.

7. MANUFACTURING PROCESS

The milling process removes the corn kernels from the cobs and turns them into flaking sized 'grits'. Malted barley can be added to enhance the flavor of the Corn Flakes. The corn grits are cooked in steam pressure cookers, at temperatures exceeding 100C. This cooking process lasts for an hour and softens the hard grits. During cooking additional water is incorporated in the form of steam which condenses and the water content in the batch rises to 30-35%. Then the hot 7 grits are transported from the cookers to large driers via the

network of pipes. The grits spend several hours in the hot-air driers in order to red use their moisture content. The corn grits are milled using rollers, which squeeze the grits flat. The flakes are then tumble toasted in huge cylindrical ovens. The air in the ovens is heated by 600C 0 gas flames and the flakes are tossed around in a rotating drum. The drum is angled so that the flakes whirl around and pass through it quite quickly, and stops them spending too long in the fierce heat. The flakes are then coated with chocolate on demand and also sprayed with flavors, minerals to make them as nutritious as possible. The Corn flakes are then bagged up with the help of a bagging machine, which uses rolls of polythene. The alternative technology is related to the volume of production. That is, for a large quantity of production (such as 600-800kg/hr) the alternative option is more appropriate. This choice requires a fully automated system at all steps-in production, packaging and boxing.

8. MANPOWER REQUIREMENT:

Sr. No.	**Designation**	**SALARY**	**Salary**	**Number**	**Number**	**Number**	**Number**	**Number**
	Working Staff		**PER ANNUM**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
1	PRODUCTION MANAGER	18000	18000	1	1	1	1	1
2	OPERATORS	12000	36000	3	3	3	3	3
3	HELPERS	10000	60000	6	6	6	6	6
			114000	10	10	10	10	10
1	**Fixed Staff:**							
2	ADMIN MANAGER	15000	15000	1	1	1	1	1
3	Accounts/Assistant	12500	50000	4	4	4	4	4
	Office Boy	9000	18000	2	2	2	2	2
	sub-total		83000	5	5	5	5	5
	Total		197000	15	15	15	15	15

9. IMPLEMENTATION SCHEDULE

The project can be implemented in 9 month's time as detailed below:

Sr. No.	Activity	Time Required *(in months)*
1	Acquisition of premises	1.00
2	Construction (if applicable)	2.00
3	Procurement & installation of Plant & Machinery	2.00
4	Arrangement of Finance	1.00
5	Recruitment of required manpower	1.00
	Total time required *(some activities shall run concurrently)*	9.00

10. COST OF PROJECT

The project shall cost Rs. 156.00 Lacs as detailed below:

Sr. No.	Particulars	₹ in Lacs
1	Land	10.00
2	Building	15.00
3	Plant & Machinery	60.00
4	Furniture, other Misc. Equipments	5.00
5	Other Assets including Preliminary / Pre-operative expenses	6.00
6	Margin for Working Capital	60.00
	Total	**156.00**

11. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of project cost.

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	39.00
2	Bank Finance	117.00
	Total	**156.00**

12. WORKING CAPITAL REQUIREMENT

The project requires working capital of Rs.60.00 Lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	30.00	0.25	7.50	22.50
2	Receivables	15.00	0.25	3.75	11.25
3	Overheads	15.00	100%	15.00	0.00
4	Creditors	-		0.00	0.00
	Total	60.00		26.25	33.75

13.LIST OF MACHINERY REQUIRED:

1. Flour mixer, 2.Spiral Elevator, 3.Extruder, 4.Cooling Vibration, 5.Air Conveyor, 6.Spreading & Cooling Machine, 7.3-layer Cooling Machine, 8.Large Elevator, 9.5-layer Fuel Oven, 10.Large Elevator, 11.Double-drum Spraying Machine, 12.Spreading Vibrator, 13.5-layer Fuel Oven14.5 Meters Cooling Conveyor.

A detail of important machinery is given below:

Sr. No.	Particulars	UOM	Qtty	Rate	Value
	Plant & Machinery				**60.00**
	Furniture / Electrical installations				
1	Office furniture	LS	0	150000	1.50
	Stores Cupboard	LS	0	250,000	2.50
	Computer & Printer	LS	1	100000	1.00
1	*sub total*				**5.00**
	Other Assets				
	Preliminary and preoperative				6.00
	sub-total Other Assets				6.00
	Total				**71.00**

All the machines and equipments are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to

have modern and flexible designs. It may be worthwhile to look at reconditioned imported machines, dies and tooling. Some of the machinery and dies and tooling suppliers are listed here below:

1. Fry-Tech Food Equipments Private Limited
S. No. 4, Ravi raj Industrial Estate,
Bhikhubhai Mukhi Ka Kuwa Bharwadvash,
Ramol, Ahmedabad - 380024,
Gujarat, India

2. Hindustan Vibrotech Pvt. Ltd.
Office No. 2, Ground Floor,
Vrindavan Building, Vile Parle East,
Mumbai – 400057,
Maharashtra, India

3. Electrons cooling systems Pvt. Ltd.
S-27, SIDCO Industrial Estate
Kakkalur Industrial Estate
Tiruvallur – 602003,
Tamil Nadu, India

4. Springboard Enterprises India Ltd.
1st, 2nd & 3rd Floor,
Plot No. 7, 8 & 9,
Garg Shopping Mall,
Service Centre, Rohini Sector 2
New Delhi – 110085,
Delhi, India

14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	180.00	210.00	240.00	270.00	300.00
3	Raw Materials & Other direct inputs	₹. In Lacs	147.41	171.98	196.54	221.11	245.68
4	Gross Margin	₹. In Lacs	32.59	38.02	43.46	48.89	54.32
5	Overheads except interest	₹. In Lacs	11.17	11.87	13.26	13.68	13.96
6	Interest @ 10 %	₹. In Lacs	11.70	11.70	7.80	5.85	4.68
7	Depreciation @ 30 %	₹. In Lacs	18.00	12.60	9.18	7.20	5.40
8	**Net Profit before tax**	₹. In Lacs	**-8.28**	**1.86**	**13.21**	**22.16**	**30.28**

The basis of profitability calculation:
This unit will have 3000 MT/Annum capacity. The growth of selling capacity will be increased 10% per year.(This is assumed by various analysis and study, it can be increased according to the selling strategy.)

Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per litre. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at 34.32 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	300.00
2	Variable costs	₹. In Lacs	245.68
3	Fixed costs incl. interest	₹. In Lacs	18.64
4	BEP = FC/(SR-VC) x 100 =	% of capacity	34.32%

16. STATUTORY / GOVERNMENT APPROVALS

The Ministry of Food Processing Industries has been operating several plan schemes for the development of processed food sector in the country during the 10th Plan. One of the schemes relates to the Technology Up-gradation/ Establishment/ Modernisation of food processing industries.

The Indian food processing industry is regulated by several laws which govern the aspects of sanitation, licensing and other necessary permits that are required to start up and run a food business. The legislation that dealt with food safety in India was the Prevention of Food Adulteration Act, 1954 (hereinafter referred to as "**PFA**"). The PFA had been in place for over five decades and there was a need for change due to varied reasons which include the changing requirements of our food industry.The act brought into force in place of the PFA is the Food Safety and Standards Act, 2006 (hereinafter referred to as "**FSSA**") that overrides all other food related laws.

FSSA initiates harmonization of India's food regulations as per international standards. It establishes a new national regulatory body, the Food Safety and Standards Authority of India (hereinafter referred to as "**FSSAI**"), to develop science based standards for food and to regulate and monitor the manufacture, processing, storage, distribution, sale and import of food so as to ensure the availability of safe and wholesome food for human consumption. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

All food imports will therefore be subject to the provisions of the FSSA and rules and regulations which as notified by the Government on 5th of August 2011 will be applicable.

Key Regulations of FSSA

A. Packaging and Labelling
B. Signage and Customer Notices
C. Licensing Registration and Health and Sanitary Permits

17. BACKWARD AND FORWARD INTEGRATIONS

The objective of the scheme is to provide effective and seamless backward and forward integration for processed food industry by plugging the gaps in supply chain in terms of availability of raw material and linkages with the market. Under the scheme, financial assistance is provided for setting up of primary processing centres/ collection centres at farm gate and modern retail outlets at the front end along with connectivity through insulated/ refrigerated transport.

The Scheme is applicable to perishable horticulture and non-horticulture produce such as, fruits, vegetables, dairy products,meat,poultry,fish,Ready to Cook Food Products,Honey,Coconut,Spices,Mushroom,Retails Shops for Perishable Food Products etc.The Scheme would enable linking of farmers to processors and the market for ensuring remunerative prices for agri produce.

The scheme is implemented by agencies/ organizations such as Govt./ PSUs/ Joint Ventures/ NGOs/ Cooperatives/ SHGs / FPOs / Private Sector / individuals etc.

Backward Linkage:

- Integrated Pack-house(s) (with mechanized sorting & grading line/ packing line/ waxing line/ staging cold rooms/cold storage, etc.)
- Pre Cooling Unit(s)/ Chillers
- Reefer boats
- Machinery & equipment for minimal processing and/or value addition such as cutting, dicing, slicing, pickling, drying, pulping, canning, waxing, etc.
- Machinery & equipment for packing/ packaging.

Forward Linkage:

- Retail chain of outlets including facilities such as frozen storage/ deep freezers/ refrigerated display cabinets/cold room/ chillers/ packing/ packaging, etc.
- Distribution centre associated with the retail chain of outlets with facilities like cold room/ cold storage/ ripening chamber.

18. TRAINING CENTERS AND COURSES

There are few specialised Institutes provide degree certification in Food Technology, few most famous and authenticate Institutions are as follows:

1. Indian Institute of Food Science & Technology,
   Plot No.1, Near Maa-Baap ki Dargah,Opp to Nath Seeds,
   Paithan Road Aurangabad
   Aurangabad - 431005

Maharashtra, India

2. MIT College of Food Technology, Pune
   Gate.No.140, Raj Baugh Educational Complex,
   Pune Solapur Highway,
   Loni Kalbhor, Pune – 412201
   Maharashtra, India

3. CSIR - Central Food Technological Research Institute (CFTRI)
   Cheluvamba Mansion, Opp. Railway Museum,
   Devaraja Mohalla, CFTRI Campus, Kajjihundi, Mysuru
   Karnataka –570020

Udyamimitra portal (link : www.udyamimitra.in) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.