

1 POTATO FLAKES

1.1 Introduction

Potato flakes are the most important form of dehydrated potato products, which also include potato granules, pellets, powder, shredded and sliced potato. Dehydrated potato flakes are made by pressing cooked mashed potatoes onto a drum drier, which forms a sheet that can be broken up and ground to the required density. Potato flakes can be used anywhere, where one would use mashed potatoes.

They are also used in commercially available products, like instant mashed potatoes, croquettes, pasta and fabricated snacks. As a thickener, they enhance creamy frozen desserts, gravies and chocolate milk. Like other dehydrated potato products, they extend the shelf life of baked goods.

After wheat, rice and maize, potato is the most important food crop in the world. It contributes to almost 50% of the total tuber and root crop production. Potato has a good food value as compared to other staple food crops as it is rich in carbohydrates and also contain proteins, minerals like calcium and potassium and vitamins like vitamin C. Boiling the potatoes increase their protein content even more than maize has and almost doubles their calcium content. It is vastly consumed as a vegetable and is also used in various forms such as starch, flour, alcohol, dextrin and livestock fodder.

1.2 Objective

The primary objective of the model report is to facilitate the entrepreneurs in understanding the importance of setting up a unit of potato flakes. 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 available raw material is potato. In Madhya Pradesh, it is cultivate in 47602 ha area with production of 7.140 lakh MT potato and productivity 15 MT/Ha.

1.4 Market Opportunities

India is a very insignificant player in the global trade of dehydrated potato products. The exports of dehydrated products from India are only to neighboring countries in form of dehydrated slices, dehydrated chips, powder, etc manufactured by small scale units.

At present, good quality flakes at affordable prices are not available in the country. Therefore, only the manufacturers of premium products have been in a position to use this product. Further, as flakes are generally imported in container loads, only bulk users can afford keep stocks and the agents importing the products have never tried to reach to the small end users. The consumption of potato flakes in India can increase manifold, once a good quality product, at an economical price is available. There are very good prospects for the growth of potato flakes in India. The following factors are likely to drive demand.

❖ **Fast growth of fast food chains**

During the last five years, fast growth of foreign and Indian fast food chains has been observed in India. The companies are now trying to open outlets not only in Metros but also in Class I towns and destinations of tourist interest. The fast food chains are recording good turn over, as given below:

Annual sales of fast food chains

Mc Donald's	Rs. 125-150 crores
Nirula's	Rs. 110-130 crores
Pizza Hut:	Rs. 100 crores
Dominos	Rs. 80-100 crores
Haldiram:	Rs. 60-70 crores
Pizza corner	Rs. 30 crores

The fast food chains use flakes for processing of formed products like cutlets, burger, meat products and Indian delicacies like pau bhaji and there are possibilities of using flakes for several other delicacies.

❖ **Increased availability**

With setting up of potato flakes units the availability will increase in market. Many small users who cannot buy in bulk would be in a position to buy small quantities.

❖ **Price affordability.**

The price of imported flakes is very high due to high basic price and customs duties etc. With the development of the domestic industry, a 30-40 % reduction in price is expected, which will increase the consumption.

❖ **Latent demand**

There is a latent demand of flakes among the small producers of snacks, using fresh or low quality substitute like dehydrated potatoes. These could switch over to potato flakes, if available at reasonable prices.

❖ **Substitution of potato flakes in traditional Indian foods**

Potato flakes are functionally like fresh potatoes could be used for making traditional snacks like samosa, dosa, tikki, paranthas etc. The production of some of these items has started in organized sector, which offers potential for use of consistent quality and round the year availability. Through product development efforts, ready to use potato fillings could be introduced in India.

❖ **Product innovation**

Big companies are constantly investing R&D efforts in innovating new products constantly to explore new market possibilities. Recently, a leading potato snack company has conducted a market survey for new products, containing potato with egg and potato with chicken. The response was encouraging among the household in Metros, which may result in new product launch in the coming months. Similarly, there are immense possibilities of developing Indian snacks.

1.5 Project description

1.5.1 Applications of potato flakes

India is a very insignificant player in the global trade of dehydrated potato products. The exports of dehydrated products from India are only to neighboring countries in form of dehydrated slices, dehydrated chips, powder, etc manufactured by small scale units

Potato flakes are most often used as an ingredient in manufactured snacks or bakery foods. However, they are far more versatile than that. A few examples of how these products enhance the taste, value and quality of different foods are:

❖ **As a Thickener**

As a replacement for cornstarch or wheat flour, dehydrated potato flour, flakes and granules add volume to soups, stews, sauces, and broths.

❖ **As a Binder**

The starch in dehydrated potato products makes them perfect for use as a binding agent in meat, fish or vegetable patties, sausages and cakes.

❖ **As a Baking Ingredient**

Because of their subtle earthy flavor, dehydrated potato products are popular in baked goods such as breads, cakes, muffins, etc. Moreover, they retain water better than substitute flours, increasing the shelf life of bakery goods.

❖ **As an Ingredient for formed products**

Formed product like Burgers, Patties etc can be conveniently made from potato flakes.

❖ **As an Ingredient for packed snacks**

Long shelf snacks like extruded products, fabricated chips are made from potato snacks.

Apart from the above uses, in Indian snacks, a variety of applications can be made by using dehydrated potato products. Potato flakes can be used for various Indian delicacies like Aloo bhujia, fillings for Samosa, Dosa etc.

1.5.2 Capacity of the Project

The installed as well as rated capacities of the various products in the optimum year have been considered as under:

Potato processing project capacity		Fresh Potatoes	Dehydrated flakes	Total Rs in Lakh
Installed capacity / day MT		16.80	12.00	29
Usable capacity	%	100	90	
Usable capacity - MT		16.80	10.80	190
Available days of supply season		250	250	500
Available capacity(3shift) MT		4200	2700	6900
Planned days		150	150	300
Planned capacity MT		2520	1620	4140
Capacity utilisation %		60	60	60.00

1.5.3 Manufacturing process

The process flow of potato flakes is depicted in the diagram below:

Flow chart for potato flakes

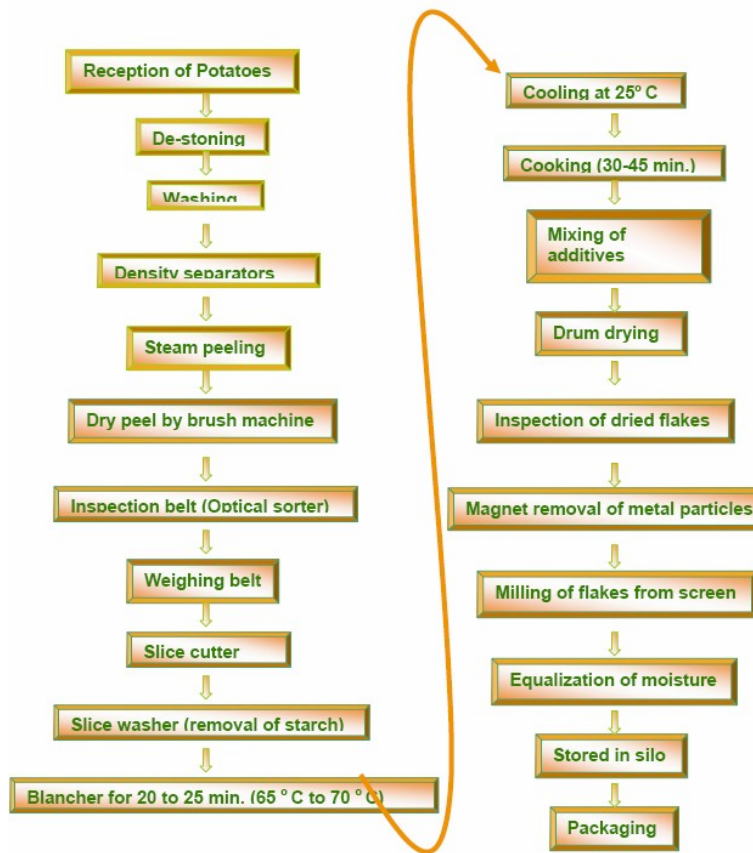


Figure 1 Flow chart for potato flakes

1.6 Project component and cost

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

PARTICULARS	AMOUNT
LAND	16.30
BUILDING	105.82
PLANT & MACHINERY	1091.57
MISC. FIXED ASSETS	16.40
CONTINGENCIES	66.61
PRE-OPERATIVE EXPENSES	89.50
MARGIN MONEY FOR WORKING CAPITAL	61.22
TOTAL	1447.43

1.7 Land and Building

The building is divided into different zones raw material hall, production hall, packing area, hygiene room etc. the total cost for the development of the building is around Rs. 122.12 lakhs.

1.8 Plant and Machinery

The total cost of the plant and machinery is Rs.1091.57 lakhs.

	DESCRIPTION	AMOUNT (IN LAKHS)		TOTAL
		INDIAN (RS Lacs)	IMPORTED (RS Lacs)	
A.	FLAKE PLANT			
1	STEAM PRESSURE PEELER PV/350	-	62.48	62.48
2	COOLING TANK WITH SCREW ELEVATOR	-	11.03	11.03
3	CONTINUOUS WASHER/BRUSHER	-	28.29	28.29
4	CUTTING ,BLANCHING , COOLING & COOKING	-	176.93	176.93
5	MASHING & DRYING	-	252.42	252.42
6	AIR TRANSPORT ,INSPECTION, GRINDING & MILLING	-	97.05	97.05
7	STORAGE- silo 5m3		7.88	7.88
8	ENERGY - AIR COMPRESSOR INC. DRYER		13.13	13.13
9	CONTROL SYSTEM		39.38	39.38
B.	PACKAGING SYSTEM			29.51
D.	UTILITIES			
1	D.G.SET(2 NOS. EACH 75 KVA)	25		25
2	REFRIGERATION PLANT(Raw Material)	54.45		54.45
3	SLOTTED ANGLE GI RACKS STORAGE SYSTEM	20		20
4	WATER SYSTEM	5		5
5	EFFULENT TREATMENT PLANT(ETP)	25		25
5	WATER TREATMENT PLANT	2		2
6	BOILER FOR BLANCHER	7		7
7	LAB EQUIPMENTS	10		10
8	OIL STORAGE TANK	4		4
9	FUEL STORAGE TANK	3		3
		170.45	703.07	873.55

1.9 Miscellaneous Assets

A provision of Rs. 16.40 lakh would take care of all the requirements.

1.10 Preliminary & Pre-operative Expenses

A provision of Rs. 89.50 lakhs would take care of pre-production expenses like establishment, professional charges, security deposits etc.

1.11 Working capital assessment

ITEMS	HOLDING PERIOD	YEAR ENDING MARCH				
		IN DAYS	Year I	Year II	Year III	Year IV
RAW MATERIALS	90	69.96	93.28	116.61	116.61	116.61
LABOUR COST	30	0.68	0.90	1.13	1.13	1.13
FINISHED GOODS	60	82.41	109.88	137.36	137.36	137.36
TOTAL		153.05	204.07	255.09	255.09	255.09
MARGIN(%)	30	45.92	61.22	76.53	76.53	76.
MPBF(%)	70	107.14	142.85	178.56	178.56	178.56

1.12 Means of finance

EQUITY	%		698.72	48.27
Private Promoter	100	699		
SUBSIDY				
MFPI - Equipment		50	50.00	3.45
TERM LOAN			698.72	48.27
FIs				
	TOTAL		1447.43	100

1.13 Cash flow statement

PARTICULARS	Year 1	Year 3	Year 5	Year 7
SOURCES OF FUNDS				
INCREASE IN SHARE CAPITAL	-	-	-	-
NET PROFIT	115.25	272.32	213.55	172.65
(INTEREST ADDED BACK)				
DEPRECIATION	62.97	62.97	62.97	62.97
PRELIMINARY EXP.W/O	9.40	9.40	9.40	9.40
INCREASE IN TERM LOAN	-	-	-	-
INCREASE IN WC	107.14	35.71	-	-
	294.76	380.40	285.92	245.03

1.14 Projected balance sheet

PARTICULARS	Year 1	Year 3	Year 5	Year 7
LIABILITIES				
SHARE CAPITAL	698.72	698.72	698.72	698.72
RESERVES & SURPLUSES	18.55	316.74	657.10	966.51
TERM LOAN	698.72	509.12	256.32	-
W.C	107.14	178.56	178.56	178.56
TOTAL	1,523.12	1,703.13	1,790.69	1,843.79

1.15 Projected profit and loss account

	Year 1	Year 3	Year 5	Year 7
NET SALES REALISATION	835.93	1,393.22	1,393.22	1,393.22
TOTAL COSTS	646.80	1,032.83	1,048.07	1,066.51
GROSS PROFIT	189.13	360.39	345.15	326.72
DEPRECIATION	62.97	62.97	62.97	62.97
INTEREST	96.70	78.73	48.39	21.43
PRELIMINARY EXP.W/O	9.40	9.40	9.40	9.40
PROFIT BEFORE TAX	20.05	209.29	224.39	232.92
TAXES	1.50	15.70	59.23	81.69
PROFIT AFTER TAX	18.55	193.59	165.16	151.23
RETAINED PROFIT	18.55	193.59	165.16	151.23

1.16 Key Indicators

NET PROFIT AFTER TAX (Rs. in lakhs)	175.21
INTERNAL RATE OF RETURN %	23.61
DEBT SERVICE COVERAGE RATIO	1.98
BREAK EVEN POINT %	49.19
PAY BACK PERIOD (YEARS)	6.57

1.17 Man Power Requirement

PARTICULARS		NO.
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PERMANENT STAFF		
MANAGER		1
TECHNOLOGIST/MANAGERS		1
MARKETING/SALE EXE.		1
EXTENSION ADVISORS		2
ACCOUNTANT		1
ELECTRICIAN/MACHANIC		2
WATCHMAN/GUARD		4
REFRIGRATION /TECHNICAL STAFF		4
PRODUCTION		
SUPERVISORY STAFF		5
STORE		
STORE OFFICERS		2
TOTAL		23

1.18 Assumptions

TERM LOAN		
Term Loan		48.27
Rate of Interest		12%
CAPACITY		
Capacity Per Annum	TPA	4140
Number of Operational Days	DAYS	300.00
Working Hours Per day	Hrs	20
SALES PRICE		
Bulk Sale		42000
Export		42900
POWER		
Connected Load	KWA	100
DEPRICIATION AS PER COMPANY'S ACT		
BUILDING		3.34%
PLANT & MACHINERY		5.28%
MISC. FIXED ASSETS		6.23%
LAND & SITE DEVELOPMENT		1.63%
MAINTENANCE		
BUILDING		
PLANT & MACHINERY		
MISC. FIXED ASSETS		2%

1.19 Source of technology

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