

# **FOOD COLORS**

## **1. INTRODUCTION:**

Now a dyes, color and pigments are one of the important sections of the chemical industry. For making different food attractive to the consumer, it is required to make colored food items. Natural pigments like chlorophyll, turmeric powder etc. has large use in the industry as it is eco-friendly and it has very small side effect. Turmeric powder is used to make yellow color. Beet powder is used for making red coloration in the food material and making red colored soft drink and grape extract color is generally used for making soft drinks colors. There is very good market demand of food color synthetic and natural. There is maximum demand of natural food color. So we can predict that there is a good scope for a new entrepreneur.

## **2. PRODUCT & ITS APPLICATION:**

A wide gamut of Orange Red Food Color: Their precise applications make these a preferred market choice. Moreover, these are made using top grade inputs and advanced machinery so as to maintain their top quality standards. Fresh & pure without additives have longer shelf life derived from fruits like strawberries, oranges and apples. Food Colors, Liquid Food Colors, Synthetic Flavoring Essence, Flavor Emulsions, Sugar Free Products, Syrups Are the major food colors. The project envisions setting up of a Natural food colors extraction unit which will cater to domestic as well as global demand. The manufacturing facilities proposed in this unit will be multipurpose and hence will be processing more than one raw material. Annatto and Marigold being non-toxic in nature are widely acceptable food colors for food products that include dairy products like butter, ghee, cheese, ice cream and margarine as well as some oil and bakery products. They are also use d in preparation of cosmetic accessories, pharmaceutical s, crayons, textiles, floor wax, shoe polishes etc. Yellow color is extracted from Marigold flowers, while butter yellow color is extracted from Annatto seed. Some

known colors in markets are Tartrazine. Yellow, Sunset Yellow, Carmoisine. Red, Ponceau Red, Amaranth. Red, Allura Red, Brilliant Blue, Indigo Carmine.

### **3. DESIRED QUALIFICATIONS FOR PROMOTER:**

Successful running this project does not require any specific qualification.

### **4. INDUSTRY LOOKOUT AND TRENDS:**

The global natural food colors market size was estimated at USD 1.32 billion in 2015 and is likely to witness rapid growth over the forecast period owing to high demand in confectionery and bakery goods. In addition, stringent regulations pertaining to the use of synthetic and identical colors is likely to emerge as the major driver for the industry growth.

The industry is expected to exhibit substantial growth on account of rising demand for the products by the alcoholic and non-alcoholic beverages manufacturing industries. In addition, increasing demand for food colors obtained from non-synthetic sources coupled with rising consumer awareness in Asia Pacific and North America is expected to bolster the demand over the forecast period.

### **5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:**

The Food Processing Industry is estimated to be worth around USD 67 billion and expected to increase to USD 175 billion by 2025 The Processed Food sector has a potential of attracting USD 33 billion investment About 6% of the total Indian produce is processed There are over 25,000 registered units in the food sector with investments of Rs 840 billion The natural food color industry market is growing at 10% - 15% annually. The rationale for growth is increasing awareness among the developed countries like USA, UK, Germany, Europe, Japan etc. about the harmful effects and consequences of using synthetic color. Since the product is expensive, it is consumed in countries having high income strata .The reason

for accelerating demand of the natural food colors in international market is the growing awareness of environmental hazards of synthetic colors and harmful impact of chemicals used for manufacturing them. European countries have not only put total ban on manufacturing of synthetic dye based colors and the products containing such colors but also banned the imports of products from the countries using such colors. Food industry is the major segment attracting investors. Natural color market products promise a good and vast market for dyes. Due to foreseen pollution problems and environmental erosions, synthetic dyes tend to be soon out of use at least in food preparations which will further give thrust to

products like Annatto dyes The world market potential for food color is expected to increase to 9000 MT by the year 2020. Global Natural food color market has touched to US \$ 1 billion. Encouragement for using Natural food colors in novel products like infant toys and crayons,

organic textile printing, handmade paper etc; India has a major agribusiness sector which has achieved remarkable successes over the last three and a half decades. Unprocessed foods are susceptible to spoilage by biochemical processes, microbial attack and infestation. The right post harvest practices such as good processing techniques, and proper packaging, transportation and storage (of even processed foods) can play a significant role in reducing spoilage and extending shelf life. The industry consists of segments like processed fruits and vegetables, cereal based products, dairy products, meat, poultry and fishery products, beverages and confectionery. Gujarat is having well developed dairy industry manufacturing butter, cheese, flavored milk, and lassi, shrikhand, yogurt and ice cream where both these natural colors will find ready market. Large pool of Chemical, Pharma, cosmetics and textile units can generate demand for Natural colors in India.

## **6. RAW MATERIAL REQUIREMENTS:**

Gujarat produced 17559 MT of Marigold Flowers from 2187 hectare of cultivated area in the year 2004 - 2005. Marigold cultivation is increasing in the state as high value floriculture, activities along with other agriculture activities. Annatto

seeds are cultivated in Gujarat presently by a private sector Bio-tech company under buy back arrangement by supplying tissue culture plants of Annatto - Bixa. Availability of canal irrigation will lead to development of value added horticulture crops like Marigold and Annatto, and such processing unit will provide ready market for growers in Gujarat. Recently cultivation of Annatto seed has started in several parts of Gujarat that is basically done through contract farming. The adjoining states of Rajasthan (mari - gold flowers), Madhya Pradesh (Annatto seeds) and Maharashtra would also help in getting the raw material in required quantum. Gujarat's marigold production is shown an escalating trend since 2002-03 to 2005 - 06 growing at an average CAGR of 54% for the last 4 years. The extraction of natural food colors depends on the coloring Content in the raw material. Different processes are used to extract the coloring content from raw material that may vary from 4 to 7% Suggested.

## **7. MANUFACTURING PROCESS:**

There are two methods for extracting natural colors. One is the conventional method that is batch type percolation which uses suitable organic solvent for extraction of the coloring material from natural materials. While Super Critical Extraction (SCE) is the advance technology used for extracting natural colors in the purest form. In India the technology for SCE has been developed by Chemical Engineering Department IIT - Mumbai. Imported technology can be sourced from Germany and Austria It can separate components in single extraction process with use of process variables like temperature and pressure and can process multiple commodities and even improve economic viability. Cold Percolation This is a traditional method of extraction used by herbalists throughout the world and it's very simple. Above a flask or vessel is suspended a cone or tube. The bottom of the tube has a perforated base which holds ground herb in place. Solvent is poured into the top of the tube where it soaks through the herb leaching out the extract and then falling out the bottom end of the tube into the flask. If desired, the percolation tube can be wrapped in heating tape to help facilitate the extraction. High Pressure - Supercritical/Sub critical Extraction This is the most technologically advanced extraction system in the world. Super Critical Fluid

Extraction (SFE) involves taking gases, usually CO<sub>2</sub>, and compressing them into a dense liquid. This liquid is then pumped through a cylinder containing the material to be extracted. From there, the extract laden liquid is pumped into a separation chamber where the extract is separated from the gas and the gas is recovered for re-use. CO<sub>2</sub>'s solvent properties can be manipulated and adjusted by varying the pressure and temperature that one works at. The advantages of SFE are the versatility it offers in pinpointing the constituents you want to extract from a given material and the fact that your end product has virtually no solvent residues left in it. (CO<sub>2</sub> evaporates completely) The downside is that this technology is quite expensive. There are many other gases and liquids that are highly efficient as extraction solvents when put under pressure

## 8. MANPOWER REQUIREMENT:

The enterprise requires 10 employees as detailed below:

Sr. No.	Designation	SALAR Y	Salary ₹ Per annum	Number of Employees				
				Year-1	Year-2	Year-3	Year-4	Year-5
	<b>Working Staff</b>							
1	Production Manager	18000	36000	2	2	2	3	3
2	Operators	12000	60000	5	5	5	7	7
3	Helpers	10000	100000	10	10	10	12	12
			196000	17	17	17	22	22
1	<b>Fixed Staff:</b>							
2	Admin Manager	15000	30000	2	2	2	2	2
3	Accounts/Stores Assistant	12500	50000	4	4	4	4	4
	Office Boy	9000	27000	3	3	3	3	3
	<i>Sub-Total</i>		107000	8	8	8	8	8
	Total		303000	25	25	25	30	30

## 9. IMPLEMENTATION SCHEDULE:

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

Sr. No.	Activity	Time
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		<b>Required (in months)</b>
1	Acquisition of premises	2.00
2	Construction (if applicable)	2.50
3	Procurement & installation of Plant & Machinery	2.50
4	Arrangement of Finance	1.00
5	Recruitment of required manpower	1.00
	Total time required <i>(some activities shall run concurrently)</i>	9.00

#### **10. COST OF PROJECT:**

The project shall cost ₹ 196.20 lacs as detailed below:

<b>Sr. No.</b>	<b>Particulars</b>	<b>₹ in Lacs</b>
1	Land	20.00
2	Building	32.00
3	Plant & Machinery	72.00
4	Furniture, other Misc Equipments	5.00
5	Other Assets including Preliminary / Pre-operative expenses	7.20
6	Margin for Working Capital	60.00
	<b>Total</b>	<b>196.20</b>

#### **11. MEANS OF FINANCE:**

Bank term loans are assumed @ 75 % of fixed assets.

<b>Sr. No.</b>	<b>Particulars</b>	<b>₹ in Lacs</b>
1	Promoter's contribution	49.05
2	Bank Finance	147.15
	<b>Total</b>	<b>196.20</b>

#### **12. WORKING CAPITAL CALCULATION:**

The project requires working capital of ₹68.25 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
	<b>Total</b>	60.00		26.25	33.75

### 13. LIST OF MACHINERY REQUIRED:

Sr. No.	Particulars	UOM	Qty	Rate (₹)	Value
					(₹ in Lacs)
	<b>Plant &amp; Machinery / equipments</b>				
a)	<b>Main Machinery</b>				
1	Glass lined reactors	Nos	1	8.50	8.50
2	Stainless steel vessels	Nos	2	15.00	15.00
3	Pulverizer, Granulate	Nos	1	9.50	9.50
4	Crystallizer, Centrifuge, Filters Dryers	Nos	1	13.00	13.00
5	Utility Equipments		1	17.00	17.00
	Installation, Taxes and Transportation			9.00	9.00
	<i>sub-total</i>				<b>72.00</b>
	<b>Furniture / Electrical installations</b>				
a)	Office furniture	LS	1	150000	1.50
b)	Stores Cupboard	LS	1	250,000	2.50
c)	Computer & Printer	LS	1	100000	1.00
	<i>sub total</i>				<b>5.00</b>
	<b>Other Assets</b>				
a)	Preliminary and preoperative				7.20
	<i>sub-total Other Assets</i>				7.20
	<b>Total</b>				<b>84.20</b>

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, Raviraj 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. Electronics 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
5. Flour Tech Engineers Private Limited  
Plot No. 182, Sector 24,  
Faridabad - 121005,  
Haryana, India



6. P Square Technologies  
 3, Swami Mahal,  
 Gurunanak Nagar,  
 Off. Shankarsheth Road Bhavani Peth,  
 Pune - 411002,  
 Maharashtra, India

7. Ricon Engineers  
 10 To 13, Bhagwati Estate,  
 Near Amraiwadi Torrent Power,  
 Behind Uttam Dairy,  
 Rakhial, Ahmedabad - 380023,  
 Gujarat, 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	140.11	163.46	186.82	210.17	233.52
4	Gross Margin	₹. In Lacs	39.89	46.54	53.18	59.83	66.48
5	Overheads except interest	₹. In Lacs	24.67	26.21	29.30	30.22	30.84
6	Interest @ 10 %	₹. In Lacs	14.72	14.72	9.81	7.36	5.89
7	Depreciation @ 30 %	₹. In Lacs	50.40	36.00	25.20	18.00	16.20
8	<b>Net Profit before tax</b>	₹. In Lacs	<b>-49.90</b>	<b>-30.39</b>	<b>-11.12</b>	<b>4.25</b>	<b>13.55</b>

The basis of profitability calculation:

This unit will have 18,000 Kg/Annum capacity (per day 50 kg average). 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 55.24% 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	233.52
3	Fixed costs incl. interest	₹. In Lacs	36.73
4	$BEP = FC/(SR-VC) \times 100 =$	% of capacity	55.24%

## 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/ Modernization 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.

FSSAI 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 FSSAI and rules and regulations which as notified by the Government on 5th of August 2011 will be applicable.**

### **Key Regulations of FSSAI**

- 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, Retail 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](http://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.

Source:- Udyami Mitra/Sidbi