

# **EXTRUDED PELLETS FROM MAIDA FOR FRYING**

## **1. INTRODUCTION:**

Extruded pellets are one of the most popular snacks food items in India. Extruded pellets making process is simple. And any individual can start this business with small start-up capital investment. Extruded Pellets from Maida for Frying in various contents, formulations, and shapes have been the staple foods for many Asian countries. Since ancient time. Extruded Pellets from Maida based on wheat are prepared mainly from three basic ingredients; flour, water, and salt. The basic process of dough mixing, sheet forming, compounding, sheeting/reduction, and cutting are essentially constant for all machine-made extruded pellets. Different ingredients and their functionality in extruded pellets processing were discussed as well. Guidelines were provided to select the right ingredients to produce high quality extruded pellets products. Processing properties, appearance, and color of extruded pellets are the three key criteria used to judge a process and raw material quality. High quality extruded pellets should be bright in color with very slow discoloration, have an adequate shelf life without visible microbiological deterioration or oxidative rancidity, and have appropriate flavor and textural characteristics which will vary according to the extruded pellets type and region. Flour plays a key role in all aspects of extruded pellets quality. Protein content is positively correlated with extruded pellets firmness and sometimes negatively correlated with elasticity. Therefore, a correct range of protein content is important for textural characteristics. Adequate gluten strength and extensibility is required in all extruded pellets flours. Extruded pellets dough must be strong enough to withstand sheeting, but not as strong as to cause tearing or difficulty in sheet reduction. A good level of dough extensibility ensures that dough sheets do not shrink back during successive roll passes. The importance of the pasting properties of starch to the texture of cooked extruded pellets has been well-documented. The required soft, smooth, and elastic textural

properties of certain types of white salted extruded pellets can be best obtained from wheat with high starch paste viscosity and high swelling starch properties. Alkaline extruded pellets do not have the same requirement for high starch swelling properties. Extruded pellets made from flour with high swelling starches have softer texture than those with low swelling starch. Extruded pellets should be bright and slow in discoloration with time after manufacturing. For white salted extruded pellets, a white or creamy white color is desirable. The level of natural yellow pigment levels in flour is highly correlated with extruded pellets color, and this is wheat variety dependent. For yellow alkaline extruded pellets, a bright yellow color is required, although the preference for the degree of color development is regionally based. Extruded pellets darkening increases with the increases of flour extraction rate. This is due to the action of polyphenol oxidase (PPO) enzymes which are largely located in the bran layer. Low flour extraction and ash levels are preferred for the manufacture of extruded pellets with a clean and bright appearance. A relatively fine flour particle size enables even hydration during mixing and optimum, uniform gluten development during sheeting. Increased starch damage, however, is associated with poor extruded pellets color and undesirable high cooking loss and excessive surface swelling.

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

Generally, extruded pellets come in two different varieties. One is ready to eat or instant extruded pellets with spice, oil etc. Another is packed plain extruded pellets that demand to mix with other ingredients and preparation. However, the ready to eat type fetches more profits than the second one. Additionally, you can sell the fresh wet extruded pellets to the local snacks shop owners. Also, you can produce macaroni, spaghetti, vermicelli, egg extruded pellets, and chicken extruded pellets and pasta from the same unit. Additionally, you can sell the fresh wet extruded pellets to the local snacks shop owners. Also, you can produce macaroni, spaghetti, vermicelli, egg extruded pellets, and chicken extruded pellets and pasta from the same unit.

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

Promoter with high business skill is basic need for this type of project. Successful running this project does not require any specific qualification.

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

Developments in the snack-food industry are numerous and ever-changing. So much so, that it would be a difficult task to cover each of the developments in these pages. However, four areas of discussion will hopefully give a general idea of the recent extruded-snack trends in the industry:

- Multidimensional snack food production
- Use of super/subcritical fluids in snack food production
- New applicator/dryers for low- or no-fat applications
- New health benefits for extruded snack foods

Third-generation snack products or pellets, sometimes referred to as semi- or half-products, are not new to the snack-food industry. In fact, they have been very popular in many regions of the world. Extrusion systems for the production of multidimensional third-generation snacks are efficient, economical to run and result in a product with built-in marketing flexibility due to long shelf-life and high bulk density prior to frying or puffing.

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

The product has the good potential market in the both urban and rural areas of our country. And the popularity is increasing rapidly. Due to fast cooking properties, instant extruded pellets today have a hugely important position in almost every Indian kitchen. Additionally, some of the major reasons for its popularity are Increasing population of the country.

- Rapid industrialization in the country
- Increasing purchasing capacity of the people
- The durability of the product
- The changing eating habit of the population.

Increasing preference for ready to eat food because of the increasing numbers of working couples etc. extruded pellets are a value added item made from flour. Amongst processed cereal products in India, extruded pellets have a share of about 45% in terms of output and constitute the largest segment in this sector of the processed food market. Extruded pellets are relatively more popular in the north-eastern region where in some states they are consumed as regular breakfast item.

The demand for extruded pellets would be mainly from urban areas where there are working couples, and product, a distant market segment which has emerged is the children's and school, college going students' market. According to a survey, the annual demand for ready-to-serve product is estimated at 4.30 lakhs tones. This works out to a per capita demand of 0.50 Kg. per year. Even at the conservative level of 0.5 kg the demand for extruded pellets in a town having population of 3 lakh is estimated at 150 tons per annum. The population of major towns in the region varies from about 2 lakhs to 20 lakhs. As such, the demand could range from 100 tons to 1000 tons per year. At present, there are a few local units manufacturing extruded pellets. Taking the capacity of a tiny unit at 150 to 200 tons per year, there is scope for 4 to 5 units depending on the population.

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

The main raw materials required are flour, custard powder, refined vegetable oil; Packing materials include polythene bags, labels and cartoons. All these raw materials are available in the local market. According to the taste and flavor of your product, you will need to formulate the recipe. However, you can source the formula and manufacturing technology

from the reliable source. Additionally, you will need to procure the packaging consumables like pouches and outer boxes.

## **7. MANUFACTURING PROCESS:**

**Dry Mixing:** The average moisture content of dry mixes is 10-11%. First of all, you must blend the three ingredients Maida, starch, and soda bicarbonate in a vertical mixer. Additionally, you will need to mix the edible color.

**Dough Formation:** You can make satisfactory dough with the above blend only by using boiled water. You will find a gelatine form of the starch here. Then mix the ingredients in the dough mixer for about 12 to 15 minutes.

**Extrusion:** Then transfer the kneaded dough to the extruded pellets making machine. From here you can produce extruded material of desired shape and length. However, you must use an appropriate type of die. Adjust the distance between the dye surface and cutting blade. The moisture content of the product at this stage is about 33%.

**Pre-drying:** Then the cut extruded pellets go from the cutting machine fall on wooden trays. The product undergoes surface drying and becomes sufficiently hard enough to handle without sticking or being crushed. The moisture content of the pre-dried product is about 29.5%.

**Drying:** Now the moisture content of the product is 17%. The final stage is steaming. After proper steaming, you can get a quality product that has longer shelf-life. The steamed and subsequently dried product has a moisture content of about 10%. Extruded pellets are a consumer durable processed food product. Therefore, it demands to establish proper distribution channel, brand awareness, and sales promotion activity. Extruded pellets manufacturing is highly profitable business as far as revenue is concerned.

## 8. MANPOWER REQUIREMENT:

Sr. No.	Designation Of Employees	SALARY PER PERSON	Salary ₹	Number of Employees				
1	Operators	12000	12000	1	1	1	1	1
2	Helpers	10000	20000	2	2	2	2	2
3	Accounts/Stores Assistant	12500	12500	1	1	1	1	1
4	Office Boy	9000	12500	1	1	1	1	1
	Total		57000	5	5	5	5	5

## 9. IMPLEMENTATION SCHEDULE:

The project can be implemented in 4months' time as detailed below:

Sr. No.	Activity	Time Required (in months)
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>	4.00

## 10. COST OF PROJECT:

Sr. No.	Particulars	₹ in Lacs
1	Land	0.00
2	Building	0.00
3	Plant & Machinery	6.00
4	Furniture, other Misc. Equipments	0.50
5	Other Assets including Preliminary / Pre-operative expenses	0.60
6	Margin for Working Capital	12.00

	<b>Total</b>	<b>19.10</b>
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**11. MEANS OF FINANCE:**

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

Sr. No.	Particulars	₹in Lacs
1	Promoter's contribution	4.78
2	Bank Finance	14.33
	<b>Total</b>	<b>19.10</b>

## 12. LIST OF MACHINERY REQUIRED:

This type of manufacturing operation doesn't demand a lot of space. However, you will need to secure a space of at least 7000 Sq. Ft for small scale operation. The main equipment required for extruded pellets making are – Chow extruded pellets making machinery, Measuring, cutting and folding equipment, and drying equipment. The main infrastructure requirements are Covered area: 5000 sq. ii) Power: 20 H.P. iii) Water: 3000 liters/day. You can start an extruded pellets manufacturing project by two ways. One is as semi-automatic and another is fully-automatic. Different types of machines are available in the market. Here we put some of the basic requirements.: Vertical type powder mixer with motor, Dough mixer blade type, extruded pellets making power operated machine with different size die-heads, Weighing scales platform type, Wooden trays, Plastic Buckets, Aluminum/Galvanised iron water tape pipeline fittings, Water boiler-fuel heated, Pouch filling and sealing machine.

Sr. No.	Particulars	UOM	Qty	Rate (₹ in Lacs)	Value (₹ in Lacs)
	<b>Plant &amp; Machinery / equipments</b>				
<b>a)</b>	<b>Main Machinery</b>				
1	Vertical type powder mixer	Nos	1	1.00	1.00
2	Dough mixer	Nos	1	0.80	0.80
3	extruded pellets unit	Nos	1	1.50	1.50

Sr. No.	Particulars	UOM	Qty	Rate (₹ in Lacs)	Value (₹ in Lacs)
4	Weighing scales	Nos	1	0.50	0.50
5	Wooden trays	Nos	1	0.30	0.30
6	Water boiler	Nos.	1	0.80	0.80
7	OTHER MACHINES AND	LS	1	1.10	1.10
	<i>sub-total Plant &amp; Machinery</i>				<b>₹ 6.00</b>
	Office furniture and Electrification	LS	1	0.50	0.50
1	<i>sub total</i>				<b>₹ 0.50</b>
	<b>Other Assets</b>				
	preliminary and preoperative	LS			0.60
1	<i>sub-total Other Assets</i>				0.60
	<b>Total</b>				<b>7.10</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:

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



- P Square Technologies  
3, Swami Mahal,  
Gurunanak Nagar,  
Off. Shankarsheth Road Bhavani Peth,  
Pune - 411002,  
Maharashtra, India
  
- Ricon Engineers  
10 To 13, Bhagwati Estate,  
Near Amraiwadi Torrent Power,  
Behind Uttam Dairy,  
Rakhial, Ahmedabad - 380023,  
Gujarat, India
  
- Kamdhenu Agro Machinery  
Plot No. 6, Near Power House,  
Wathoda Road Wathoda,  
Nagpur - 440035,  
Maharashtra, India

### 13. WORKING CAPITAL CALCULATION:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	6.00	0.25	1.50	4.50
2	Receivables	3.00	0.25	0.75	2.25
3	Overheads	3.00	100%	3.00	0.00
4	Creditors	-		0.00	0.00
	<b>Total</b>	12.00		5.25	6.75

#### 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	36.00	42.00	48.00	54.00	60.00
3	Raw Materials & Other direct inputs	₹. In Lacs	31.37	36.60	41.83	47.06	52.29
4	Gross Margin	₹. In Lacs	4.63	5.40	6.17	6.94	7.71
5	Overheads except interest	₹. In Lacs	2.52	2.68	2.99	3.09	3.15
6	Interest @ 10 %	₹. In Lacs	1.43	1.43	0.96	0.72	0.57
7	Depreciation @ 30 %	₹. In Lacs	4.20	3.00	2.10	1.50	1.35
8	<b>Net Profit before tax</b>	₹. In Lacs	<b>-3.53</b>	<b>-1.71</b>	<b>0.12</b>	<b>1.64</b>	<b>2.64</b>

The basis of profitability calculation:

This unit will have 150 tonnes/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. BREAK-EVEN ANALYSIS:

The project shall reach cash break-even at 48.29 % of projected capacity.

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	60.00
2	Variable costs	₹. In Lacs	52.29
3	Fixed costs incl. interest	₹. In Lacs	3.72
4	$BEP = FC/(SR-VC) \times 100 =$	% of capacity	48.29%

## **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.

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, 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, Kajjehundi, Mysuru  
Karnataka – 570020

Udyamimitraportal ( 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.