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Technology and Equipment Manufacturing Opportunities in Food Processing Sector in India

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Foreword

Food processing is considered as one of the fastest growing industries in India. The growth of the industry is supported by the availability of a large raw material production base. India is the largest producer of milk, bananas, mangoes, guavas, papaya, ginger, okra, second largest producer of wheat, rice, fruits, vegetables, tea, sugarcane and cashew nut and the third largest producer of cereals, coconut, lettuce, chicory, nutmeg, mace, cardamom and pepper globally.

Given the natural supply advantage and a population of 1.3 billion people (that spend a high proportion of their disposable income on food), there is a potential to nurture mutually beneficial relationships with global food processing, food retail and related supply chain organizations who could realize significant business growth opportunities in India, through new technologies, innovations and other methods of value additions.

Further, India's geographical location gives it a unique advantage when it comes to exports, having convenient connectivity to Europe, Middle East & Africa from the western coast, and Japan, Singapore, Thailand, Malaysia, Korea, Australia & New Zealand from the eastern coast.

Food processing is a priority sector for the Indian Government, as well as one of the focus sectors in the Make in India initiative. Further, the availability of affordable credit and other fiscal incentives has also led to India being considered as one of the most favourable markets.

In light of the above factors, and with total consumption of the food and beverage segment in India expected to increase from US$ 369 billion to US$1.142 trillion by 2025, output of the food processing sector (at market prices) is expected to increase to US$ 958 billion for the same period. These estimates clearly evidence the vast market opportunity offered by the Indian food processing, food retail, transport, logistics and related infrastructure sectors to players in the food processing value chain.

We trust that this report would be a useful guide for international as well as domestic food processing, food retail and related supply chain companies that are looking to invest or expand their presence in India.

Preface

The report entitled, ‘Technology and Equipment Manufacturing Opportunities in Food Processing Sector in India’ is first of its kind of report that provides an insight into market of plant and machinery for the food processing sector.

This report attempts to estimate the market size of the food processing equipment manufacturing in India over next eight years, between the period 2017 to 2025, thus providing a view of the market and its growth potential. It is estimated that the market for plant and machinery in the food processing sector in the year 2024-25 will be USD 51.41 billion as compared to the current value of USD 17.3 billion (2016-17).

Leading Global Equipment Manufacturers (GEMs) are already present in India to address the needs of the food processing sector. Some of the leading GEMs are operating in India, by having their own manufacturing base or in partnership or through joint venture. This report also bring out an interesting perspective that a manufacturing base in India will help GEMs to not only serve the domestic market in a cost effective manner but also help in access to a large growing neighboring markets such as Asia. The current Indian food processing ecosystem and the impetus given by Government of India is the right time for the global equipment manufacturing firms to set up a manufacturing base for machinery and equipment.

Executive Summary

Many Global Equipment Manufacturers (GEMs) are already present in the country to address the needs of the food processing sector. The GEMs are operating in India, either with their own manufacturing base or in partnership or through joint venture. A manufacturing base in India will help GEMs to not only serve the domestic market in a cost effective manner but also help in access to a large growing Asian market. The present scenario of the food processing sector offers a huge opportunity for the global equipment manufacturing firms to set up a manufacturing base for machinery and equipment.

This report attempts to estimate the market size of the food processing equipment manufacturing in India in the next eight years, between the period 2017 to 2025, providing a view of the market and growth potential. It is estimated that the market for plant and machinery in the food processing sector in the year 2024-25 will be USD 51.41 billion as compared to the current value of USD 17.3 billion (2016-17). In the same duration, the fixed capital investment in the sector is expected to increase by more than two hundred per cent. This estimate is primarily based on the Annual Survey of Industries data, considering parameters of fixed capital and gross value of plant and machinery over a period of time. Furthermore, the report highlights the infrastructure gap that exists in the sector in India.

The Government of India, particularly the Ministry of Food Processing Industries (MoFPI), as part of the focus sectors under Make in India, is driving the sector's growth by creating an enabling environment for investments through sector-friendly policies and grant-in-aid support for the sector.

1 Overview: Food Processing Sector

India offers a great potential for the food processors of the world. India is the second largest producer of food and agri-commodities in the world, and thus plays an important role in the gobal food processing industry. It has a large geography with an estimated Gross Cropped Area (GCA) at 193.76 million hectares and total operated area of 159.59 million hectares[1]. It is host to diverse agro-climatic zones, climates, soils, terrains and crops. The agricultural production of India has consistently recorded higher output. India ranks number one in the world in the production of Milk, Clarified Butter (Ghee), Ginger, Banana, Guava, Papaya and Mangoes. Further, India ranks second in the world in the production of Rice, Wheat and several other vegetables and fruits.

The availability of a wide range of cereals, oilseeds, pulses, herbs, spices coupled with high level of consumption allows a unique opportunity for various international and global businesses to be a part of the food industry in India.

The contribution of the food processing sector to Gross Value Added (GVA), employment and investments is significant. Several factors such as high production as well as huge market size, combined with increasing income levels of the middle class, higher consumer awareness, high levels of consumption and low levels of processing in the country make India an ideal destination for investment in the sector.

Furthermore, the Government of India has taken several initiatives to support the sector with 100 per cent Foreign Direct Investment (FDI) in food processing, warehousing, storage and transportation for cold chains and marketing of food product produced and manufactured in India.[2] These initiatives provide an array of opportunities to the foreign players to invest in India.

The MoFPI is spearheading the initiatives of Government of India in supporting the food processing sector. The Ministry is making all efforts to encourage investments in the sector. It has approved proposals for joint ventures, foreign collaborations, industrial licenses and 100 per cent export oriented units. [3]

The Ministry has also launched the Pradhan Mantri Kisan Sampada Yojna (PMKSY) to supplement agriculture, modernize processing and decrease agri-waste. PMKSY is expected to augment technology infusion, create enhanced forward and backward linkages between farmer producer companies and the food processing industry, develop agro-processing clusters, create a robust supply chain infrastructure and promote skill development in the sector. PMKSY has an allocation of USD 901 million and is expected to leverage investment of USD 4.72 billion,

[1] Highlights of Agriculture Census 2010-11, http://pib.nic.in/newsite/PrintRelease.aspx?relid=132799
[2] http://mofpi.nic.in/sites/default/files/databank.pdf
[3] https://www.ibef.org/industry/indian-food-industry.aspx

handling 334 lakh Metric Tonnes(MT) agro-produces valuing USD 15.6 billion, benefit 20 lakh farmers and generate 530,500 direct or indirect employment in the country by the year 2019-20.[4]

With an increase in demand for food products, abundant supply of raw materials and several incentives offered by the Government, food processing sector has emerged as one of the major growth-oriented sectors in India. [5]

Medium and big players in food processing industry mostly import critical components required for their processes. For small players in the industry, cost of the imported equipment is a big constraint and hence they go for local fabricated machines and equipment supporting local food processing equipment manufacturing industry. However, currently the equipment manufactured in the country lack the precision required for complex processes involved in food processing, due to dearth of advanced technology owing to limited research and development facilities available for local manufacturers.

The Government is encouraging the technological advancements for the industry by providing specific incentives to the sector in terms of duty reductions, duty exemptions etc. Given this scenario, there is an abundant opportunity for various multinational companies to explore the manufacturing of equipment for food processing sector in India.

About the report

The report provides an insight on the appetite for food processing equipment market in India and analyses various sub-sectors and opportunities within each sub-sector. In addition, the report provides the details of the policy initiatives and reforms undertaken by the government to support the sector. It further provides a concise list of major global and Indian manufacturers in India in the sub-sectors within the food processing sector.

[4] http://pib.nic.in/newsite/PrintRelease.aspx?relid=170174
[5] Annual Report 2016-17, Ministry of Food Processing Industries(MoFPI)

2 Food Processing Equipment: Market Scenario & Growth Opportunities in India

2.1 Introduction

The growth in the processing equipment market in India is driven mainly by the increased demand for processed food products .The consumer is shifting towards more value-added food categories such as yoghurt, cheese, processed meat and ready-to-eat food products. In addition, there is a growing demand for processing basic products such as fruits, vegetables and grains which require technologically advanced equipment. Therefore, there is a need to adopt new methods, technology, and machinery for the food processing industry with least impact on sensory qualities such as colour and texture. Technological advancements are necessary for the growth of the sector and for the diversification of the existing production capacity of the food processing industry.

The next phase of growth of food processing sector will require creation of infrastructure across the value chain. There is a massive requirement for infrastructure creation, pack houses at the farm gate, cold storage facilities across the value chain, latest technology for processing of food products while retaining its nutritional value, multi-modal logistics, infrastructure at port gateways with phyto-sanitary facilitation etc.

There are equipment manufacturers specialising in manufacturing equipment used in the food processing sector and support infrastructure addressing unique features of the industry. Some of the key features of equipment used in food processing sector are high precision, automation with high speed, ability to withstand harsh cleaning agents, precise temperature control among others.

Food processing requires high precision in the equipment for quality, safety and hygiene. Stainless steel fabrication is must for any machinery that comes in direct contact with the food product and must be free of cracks and crevices that might retain food particles.

The automation requirement in food processing equipment is quite advanced and sophisticated. Largely, the machines used in the industry have similar automation and motion control needs, such as material conveying and positioning, heating, drying and cooling.

The food processing equipment has a constant need for cleaning and disinfecting, gentle handling and precise control of temperature, pressure, treatment times and other process parameters. A number of digital sensors, pipes, transmitters, tanks, tubes are used in the processing line. These equipment need to withstand harsh cleaning agents, ranging from steam and water to alkaline solutions, organic solvents, hypochlorites, iodine compounds and nitric acid.

Processing stages and characteristics of equipment

Raw Material Preparation

Each manufacturing plant contains a collection of industry-standard equipment and customized models configured to best suit a specific process.

- Liquids preparation requires storage tanks (jacketed and non-jacketed for heating and/or cooling), pumps and piping, and heat exchangers.
- Dairy preparation includes receiving, piping, storage tanks, pumps, pasteurizers, separators and dryers.
- Animal preparation is largely done by automated equipment specific to the industry,
- Vegetable preparation includes washing and chopping, sorting by color, adding preservatives or other processes prior to packaging.

Processing Equipment

Food processing is unique in that there are several ways to accomplish the same process.

- Processing liquids, such as soups and oils, requires heating and fractionating equipment, as well as vessels, many of which are jacketed to allow steam heating or cold water cooling.
- Dairy processing involves pasteurization, separation, and drying, mixing and cheese-making storage. Clean-in-place (CIP) systems are installed primarily in liquid processes, like dairy, for the purpose of cleaning the interior of the equipment without disassembling it.
- The conversion of meat products into finished goods can be done through grinding, cooking, blending, stuffing and trimming.
- Vegetable processing consists of color sorting, shucking, mixing, cooking and chilling.

Packaging Equipment

Every product has different packaging requirement.

- Vegetable packaging is similar and also includes canning and freezing.
- Canning equipment has a strong secondary market due to its versatility, and spiral-type freezers are also desirable.
- Liquids are canned, boxed or bagged, and packaging for milk products varies depending on the end product.
- Meat can be packaged fresh or frozen. Although most modern packaging equipment has digital controls and operates at high speed, meat packaging remains labor-intensive.

Such advanced technological requirement for the food processing sector makes India one of the largest importer of plant and machinery in the sector. The technological advancements also create a need to replace older machines with new ones for the food processing companies. Therefore, India is poised to remain an attractive market for technology companies for their solutions to both new entrants as well as existing players for replacement of older machines.

2.2 Food Processing Equipment Imports

According to the database of the Department of Commerce, Government of India, India imported USD 168 million worth of plant and machinery in the year 2016-17. However, this number does not include generic equipment, which are not exclusively used in the food processing industry. Therefore, the actual size of the import of equipment used in food processing sector could be larger. The data presented in this report is taken from the segments which are defined as food processing according to the Department of Commerce, Government of India. Details of classification under food processing is given in Annexure 1.

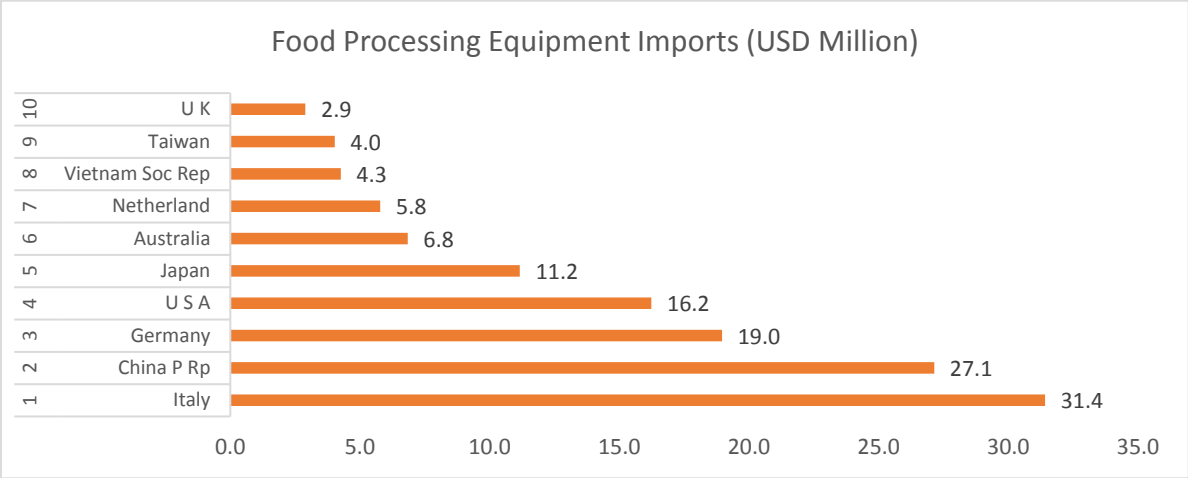
During the year 2016-17, out of the total import of USD 168 million for food processing equipment, import for dairy sector equipment was USD 16.75 million and for all other sub-sectors in the food processing was USD 151.63 million.

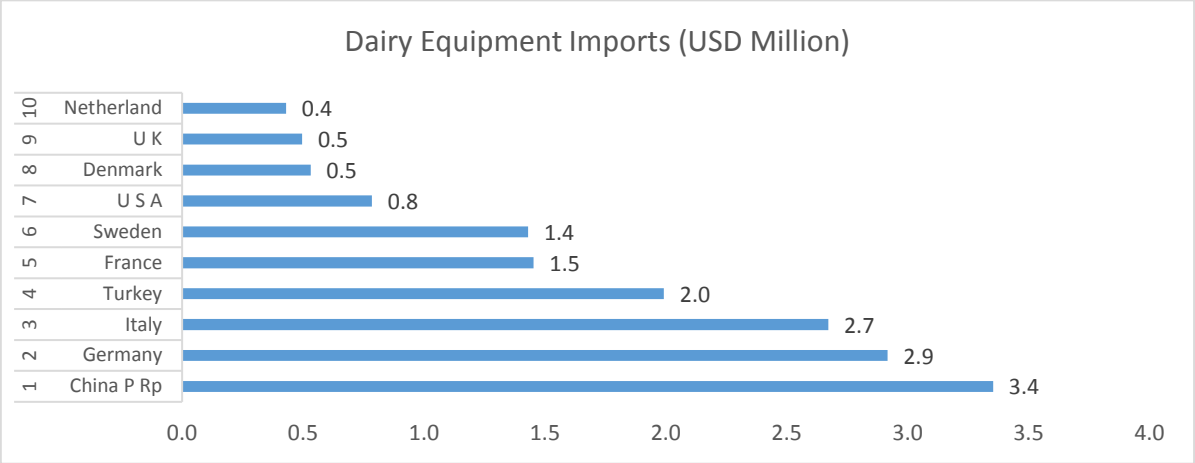
Year	A = Food Processing Equipment (Excluding Dairy) (USD Million)	B= Dairy (USD Million)	Total (A+B)
2014-2015	177.15	21.93	199.08
2015-2016	187.71	28.05	215.76
2016-2017	151.63	16.75	168.38

Source: Department of Commerce, Government of India

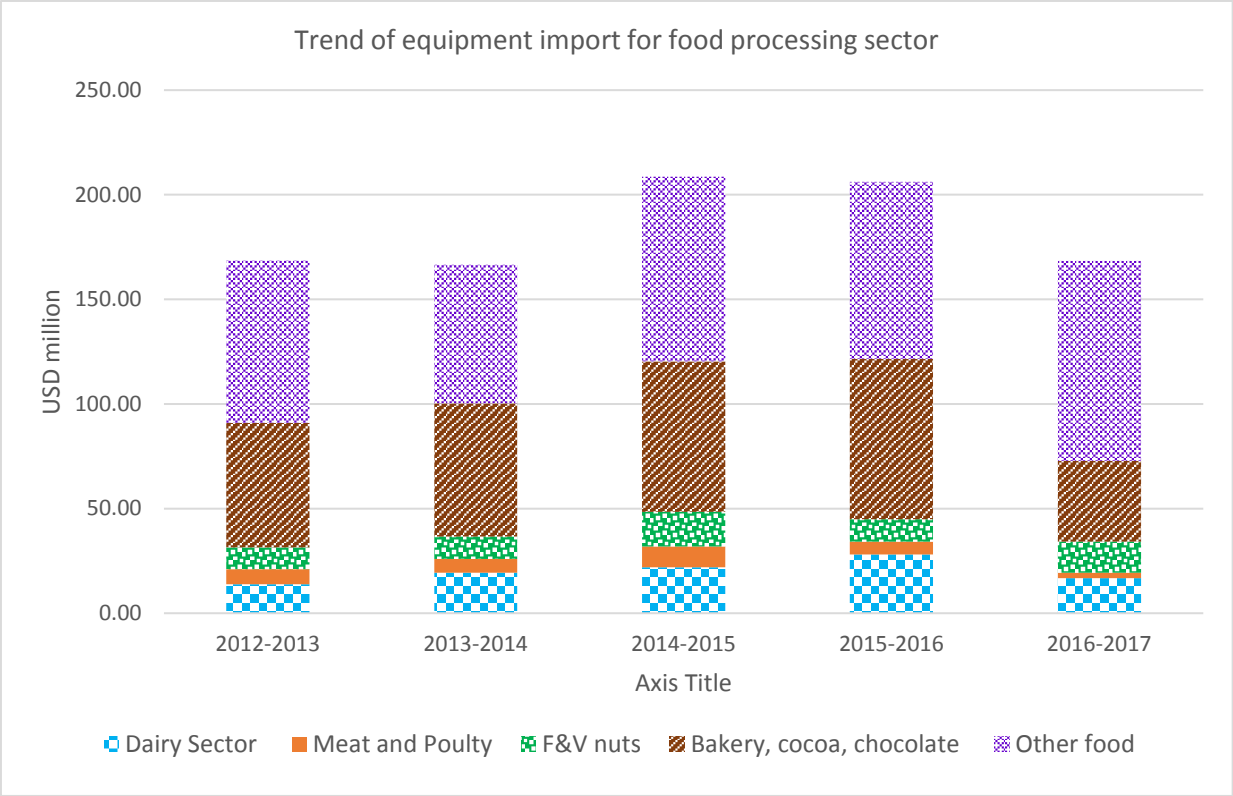
China, Germany and Italy are the top three countries from where India imported its food processing equipment in 2016-17. Sector wise, bakery and cereal processing is the single largest segment in terms of import of machinery.

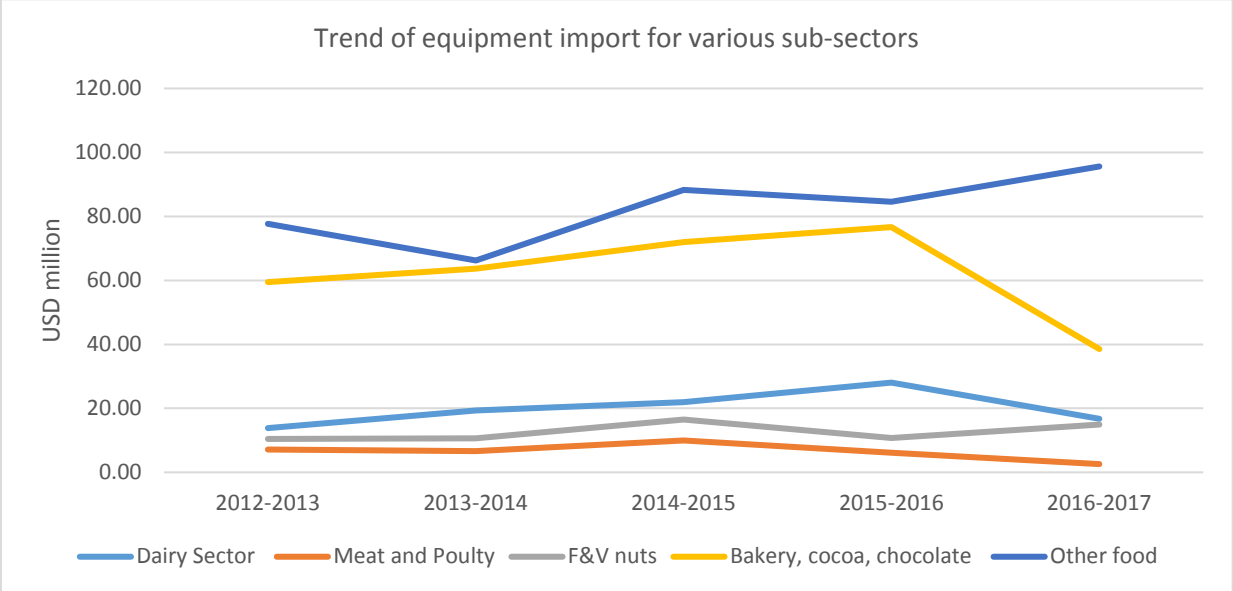
Following charts provide a synopsis of the top 10 countries in terms of source country (destination India) for import of equipment for food processing sector, excluding value of import for dairy equipment. The reference year is 2016-17.





Further, sub-sector wise import data presents the breakup of imports for the sub-sectors. Bakery, cocoa and chocolate processing is the largest sub-sector importing equipment for food processing. Also, there has been an overall increase in the imports in the last five years for most of the sub-sectors excluding dairy and bakery, which decreased in the year 2015-16 as compared to the year 2016-17.





2.3 Equipment Manufacturing Companies in India

The growth of food processing industry is fuelling the demand for equipment for the sector. The Indian food processing market has the presence of most of the global equipment manufacturing companies. These companies specialise in the manufacturing of equipment used for multiple food products and sub-sectors. Domestic equipment manufacturers are mostly small and medium sized, catering to the demand of small and medium food processing players in the market. A number of these Indian players also operate as importers for global equipment suppliers in India.

Global industry players such as GEA Group, Tetra Laval, Buhlar, Alfa Laval, Heat and Control and HRS process are present in India. These companies are supplying equipment for the processing of products across the value chain of sub-sectors. For example, German manufacturer GEA is building a turnkey plant for AmulFed, the largest milk powder plant in Asia, completely automatic and equipped with the latest technologies[6]. The plant will have a production capacity of 150 tonnes per day of skimmed milk powder and 120 tonnes per day of dairy whitener/baby food. The new plant will process around 90,000 litres per hour of milk to produce multiple value-added products.

Swiss Manufacturer, Buhler Group entered India as Buhler India Pvt. Ltd, a 100 per cent subsidiary of Buhlar and commenced its operations with a manufacturing plant at Attibele, near Bangalore. It is a leading supplier of equipment for rice milling, flour milling, colour sorting, animal feed technology, oil milling, grinding and dispersion technology and die casting systems, with a turnover of more than USD 35.6 million. Bühler's Atta process with PesaMil is the an industrial process technology, using circulation system with the high-compression that enables the production of authentic whole wheat *Atta* flour. Its taste and texture are identical to Atta flour produced on traditional Chakki stone mills in India. The Indian manufacturing facility also caters to the solutions; for the supplies to the neighbouring countries such as Pakistan, Nepal, Bangladesh, Burma and Sri Lanka.[7]

Similarly, another major global player in the food processing sector Alfa Laval considers India as a significant market. The company started its operations in India as early as 1937 and established its first manufacturing facility in Pune near Mumbai in 1961. Today Alfa Laval India has a large set up with around 1,200 employees, 5 manufacturing units and 14 sales and services centres spread across the country. Alfa Laval in India has its production based on Alfa Laval's three technologies; heat transfer, separation and fluid handling. Particularly, German manufacturers have a strong presence in equipment manufacturing segment in India.

German Engineering Association, VDMA has provided details regarding the Business of Association Members in India for this report.

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[6] *http://www.gea.com/en/news/corporate-news/2017/gea-to-build-asia-largest-milk-production-facility-in-india.jsp*

[7] http://www.buhlergroup.com/global/en/home.htm#.WdB0sWiCzIU

A Case Study of German Manufacturers in India

The food processing and packaging machinery industry is one of the largest industrial sectors within the German mechanical engineering industry. The sector stands for 6.5 per cent of the total German machinery production. In the year 2016, 600 mainly medium-sized companies with 56,960 employees' manufactured machines and equipment worth 13.3 billion euros, an increase of 2.4 per cent compared to the previous year. A large proportion of German production is sold to more than 100 countries worldwide. Last year's exports (2016) amounted to 8.3 billion euros and an increase of almost 4 percent compared to the previous year. Asia after Europe, is the most important sales region for German food processing and packaging machinery manufacturers. In 2016, machinery and equipment worth 1.4 billion euros was supplied to the Asian countries.

According to VDMA, India is the third largest sales market for food processing and packaging machines of Germany origin in Asia, after China and South Korea. In 2016, India imported food processing and packaging machines worth 136 million euros from Germany. At a value of 113 million euros, packaging machines had the largest share (83 per cent) followed by the food processing machines with a value of 23 million euros.

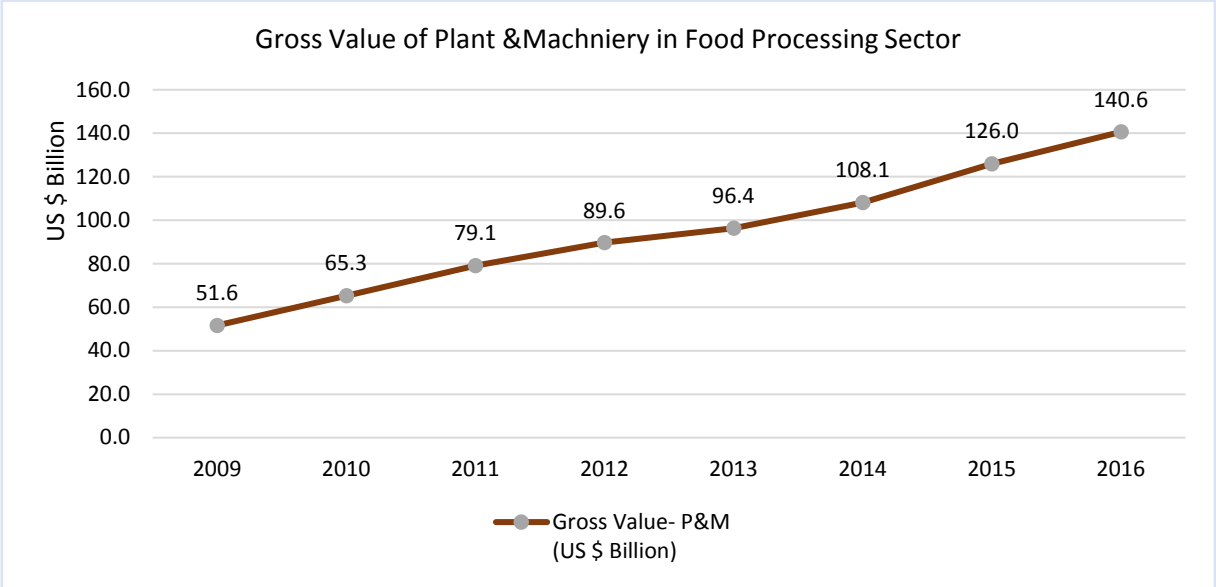
Source: VDMA

3 Opportunity for Equipment Manufacturers

This chapter is primarily based on the Annual Survey of Industries (ASI) database[8]. The objective of this chapter is to understand the pattern and trends of capital deployment in food processing sector in India and estimate the potential market size for equipment until 2024-25. The analysis is based on the data for the last seven years, i.e. from the year 2008-09 to 2014-15. As the ASI data is collected with reference to National Industrial Classification (NIC), a broad classification of subsectors is made within the food processing sector. Annexure 3, provides detailed information on the methodology used for this analysis.

Manufacturing Sectors:

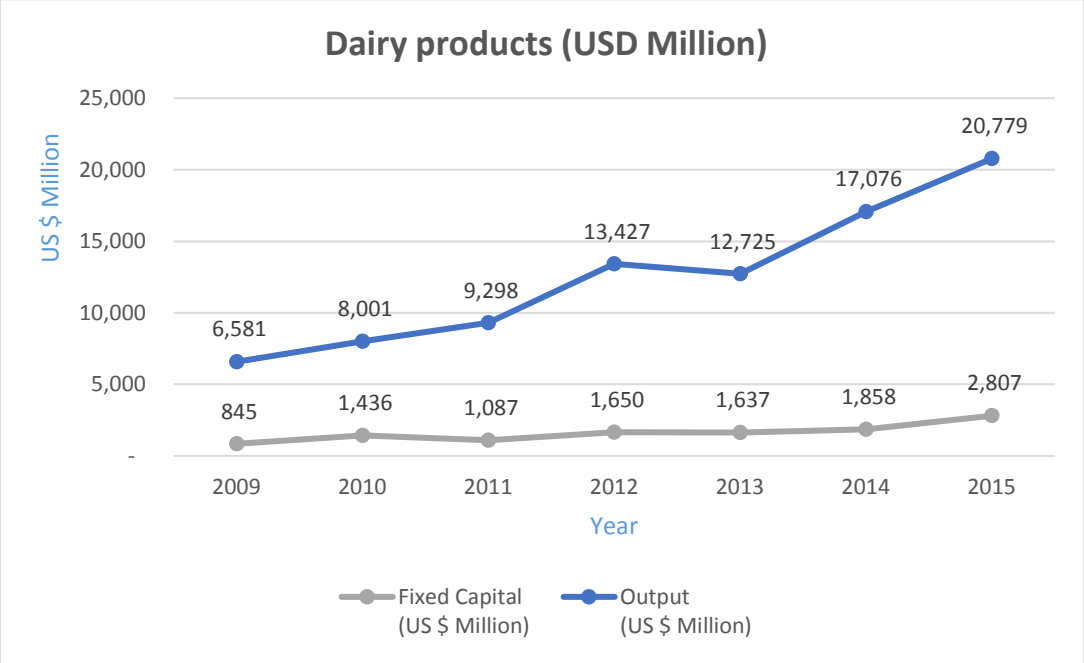
1. Dairy (Milk and Milk Products)
2. Fruits and vegetable processing
3. Cereal processing
4. Vegetable oil, animal oil and fat processing
5. Meat and meat products
6. Soft drinks, mineral water and other beverages
7. Prepared meals and other food
8. Sugar and sugar based confectionaries including cocoa
9. Animal feed processing



[8] Annual Survey of India, http://www.csoisw.gov.in/CMS/cms/Home.aspx

3.1 Dairy Products

The subsector manufacturing dairy products over seven years, from 2008-09 to 2014-15 had a compounded annual growth rate of 13 per cent in fixed capital and 16 per cent in total output. This reflects huge capital deployment in the segment as well as growth in the output for the segment.



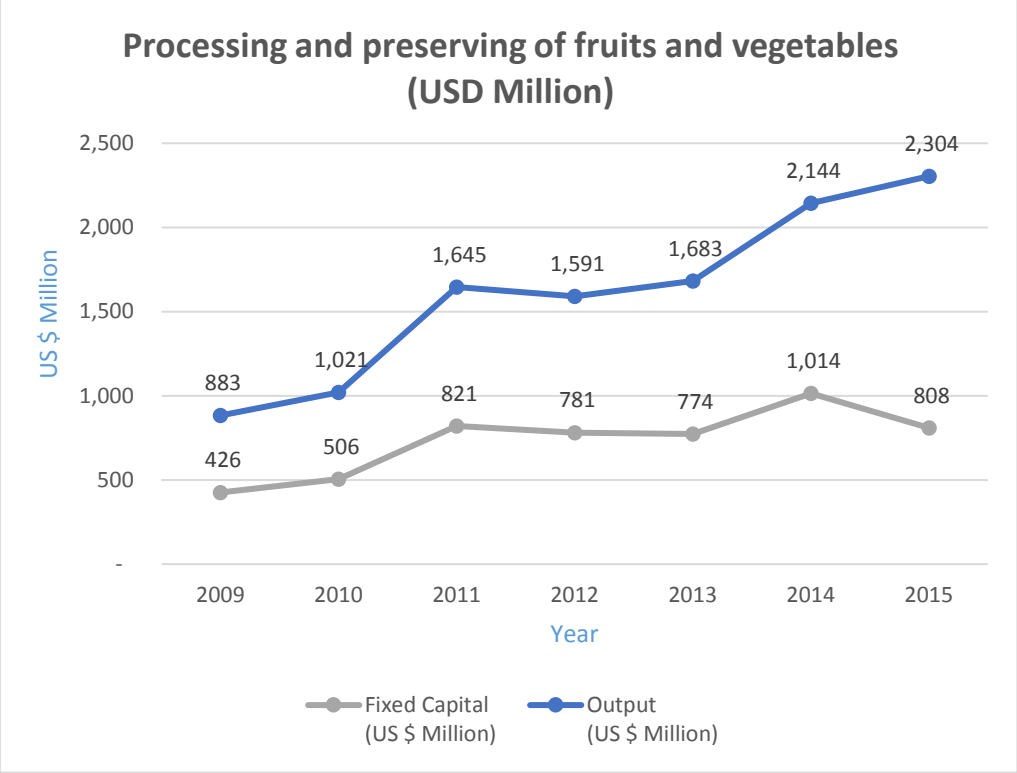
In the last seven years during 2008 to 2015, investment in plant and machinery for the segment was on an average around 81 per cent of the fixed capital. During this period, gross value of plant and machinery witnessed a compounded annual growth of 11 per cent. In the year 2013-2014, with 13 per cent growth rate in fixed capital as compared to previous year's fixed capital – the output grew by 2.5 times in terms of growth rate as compared to previous year.

Projecting the growth of the segment for the next 10 years at the current growth rate of 13 per cent, the investment in fixed capital is estimated to be USD 9,815 million by the year 2024-25. Factoring the growth for gross value of plant and machinery at 81 per cent of fixed capital, the expected size of the segment is estimated to be USD 7,951 million by the year 2024-25.

3.2 Processing and Preserving Fruits and Vegetables

Processing and preserving fruit and vegetables sector, over the last seven years, from 2008-09 to 2014-15 had a compounded annual growth rate of 8 per cent in fixed capital and 12 per cent in total output. This reflects that huge output has been obtained with the deployment of fixed capital. The sector has observed a parallel positive trend between fixed capital and output for the year 2010-12 and 2013-14.

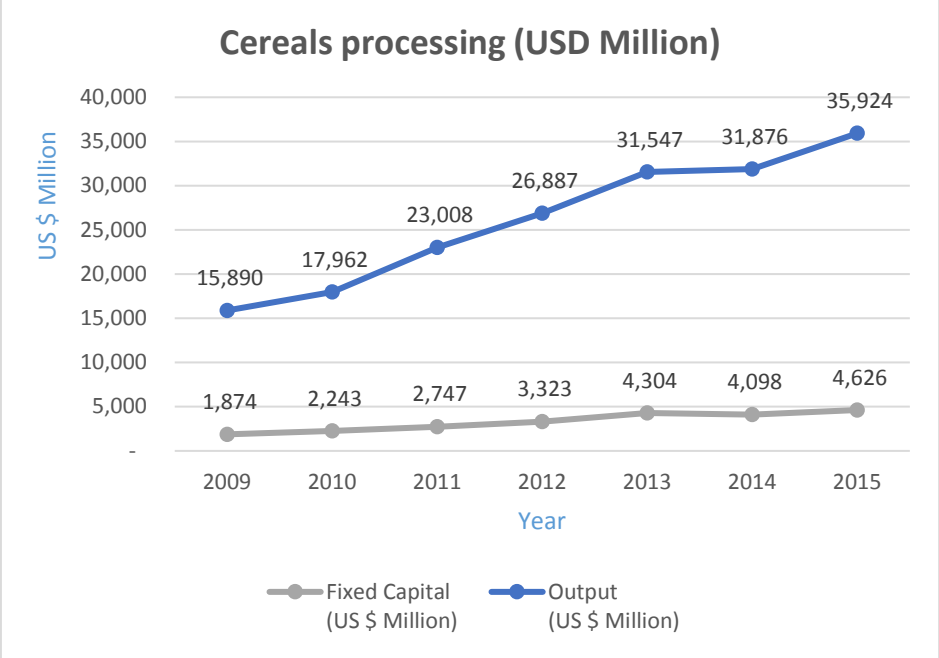
In the last seven years from 2008 to 2015, investment in plant and machinery for the segment was on an average around 65 per cent of the fixed capital. During the same period, gross value of plant and machinery witnessed compounded annual growth of 11 per cent.



Projecting the growth of the segment for the next the 10 years at the current growth rate of 8 per cent, the investment in fixed capital is estimated to be USD 1,774 million by the year 2024-25. Factoring the growth for gross value of plant and machinery at 65 per cent of fixed capital, the expected size of the segment will be USD 1,152 million by the year 2024-25.

3.3 Grain Mill Products, Starches and Starch Products and Bakery Products

The cereal processing (comprising grain mill, starch and products, bakery sub- sectors together) over the period of seven years, from 2008-09 to 2014-15 had a compounded annual growth rate of 14 per cent in fixed capital and 12 per cent in total output. On analyzing the segment closely, it can be inferred that fixed capital deployment and output has faced parallel growth across multiple years.



In the last seven years from 2008 to 2015, investment in plant and machinery for the segment was on an average around 54 per cent of fixed capital. During the same period, gross value of plant and machinery witnessed compounded annual growth of 14 per cent.

Projecting the growth of the segment for the next 10 years at the current growth rate of 14 per cent, the investment in fixed capital is estimated to be USD 16,647 million by the year 2024-25. Factoring the growth for gross value of plant and machinery at 54 per cent of fixed capital, the expected size of the segment is estimated at USD 8,990 million by the year 2024-25.


A
B
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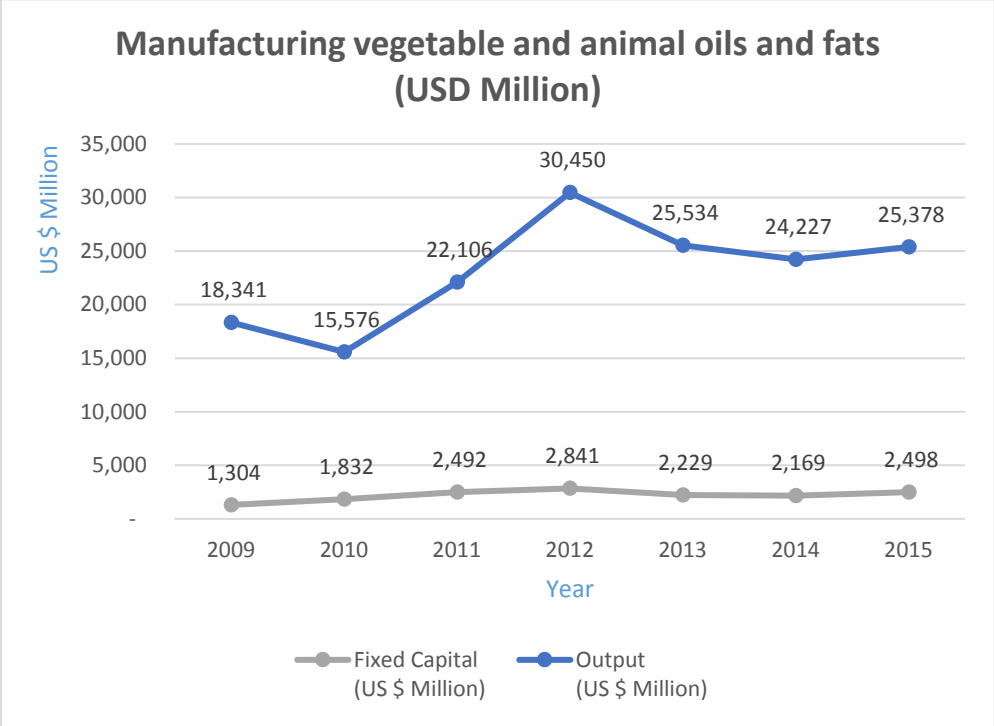
3.4 Vegetable and Animal Oils and Fats

Manufacturing vegetable and animal oils and fats sector, over seven years, during 2008-09 to 2014-15 had a compounded annual growth rate of 4 per cent in fixed capital and 6 per cent in total output. The sector during the period 2008-2015, has witnessed a slow and consistent growth in fixed capital and output growth rate. From 2011-12 to 2012-13, fixed capital growth rate was 42 per cent and 38 per cent respectively, but for these years, the output growth rate was 10 per cent and 4 per cent respectively. Hence, the segment has a variable relation between fixed capital and output.

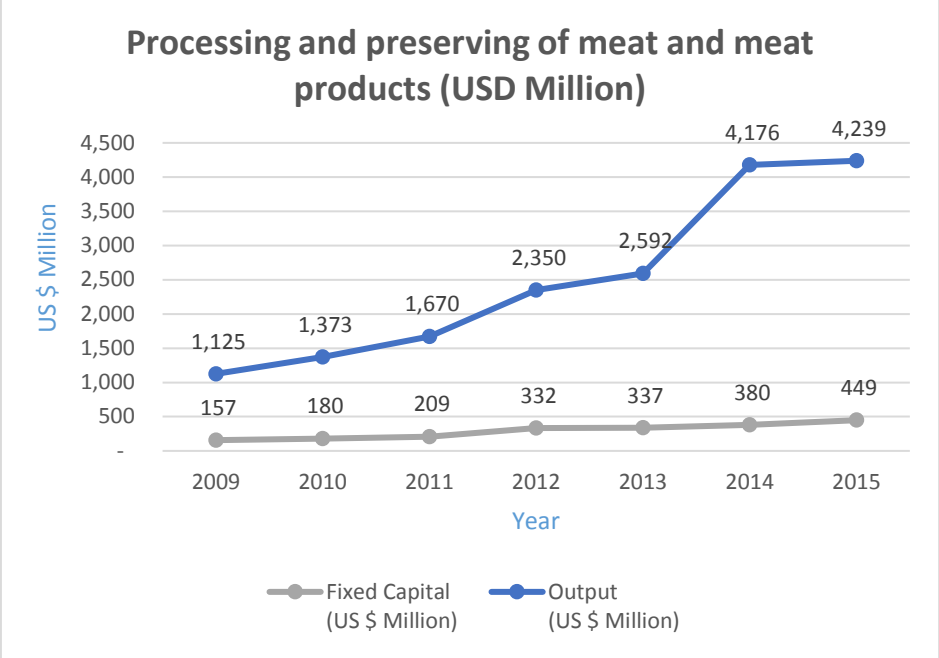


In the last seven years from 2008 to 2015, investment in plant and machinery for the segment was on an average around 87 per cent of fixed capital. During the same period, gross value of plant and machinery witnessed compounded annual growth of 5 per cent for the sector.

Projecting the growth of the segment for the next 10 years at the current growth rate of 4 per cent, the investment in fixed capital is estimated to be USD 3,749 million by the year 2024-25. Factoring the growth for gross value of plant and machinery at 87 per cent of fixed capital, the expected size of the segment is estimated at USD 3,264 million by the year 2024-25.

3.5 Processing and Preserving Meat, Fish, Crustaceans and Molluscs Products

The segment comprising processing and preserving of fish, meat etc., over the period of seven years, from 2008-09 to 2014-15 had a compounded annual growth rate of 16 per cent in fixed capital and 24 per cent in total output. Hence, the sector has witnessed a huge growth in output with growth in fixed capital deployment. In the year 2013-14, output rate declined by 3 per cent despite the increment of 10 per cent in fixed capital.

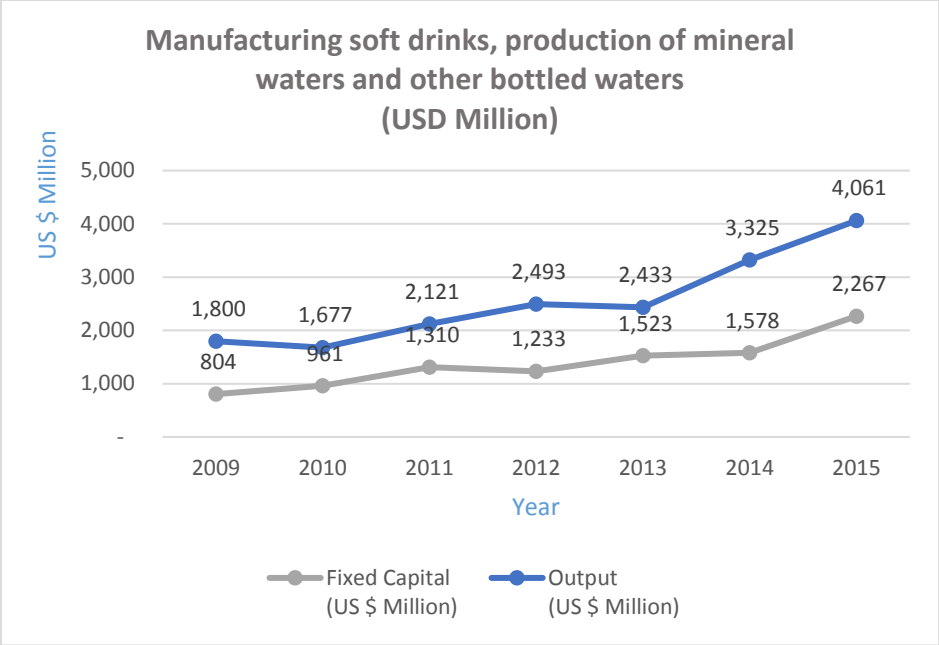


In the last seven years from 2008 to 2015, investment in plant and machinery for the segment was on an average around 63 per cent of fixed capital. During the same period, gross value of plant and machinery witnessed compounded annual growth of 12 per cent.

Projecting the growth of the segment for next 10 years at the current growth rate of 16 per cent, the investment in fixed capital is estimated to be USD 3752 million by the year 2024-25. Factoring the growth for gross value of plant and machinery at 63 per cent of fixed capital, the expected size of the segment is estimated at USD 2250 million by the year 2024-25.

3.6 Soft Drinks, Production of Mineral Waters and other Bottled Waters

Manufacturing soft drinks; production of mineral waters and other bottled waters sector, over the seven years, from 2008-09 to 2014-15 had a compounded annual growth rate of 12 per cent in fixed capital and 22 per cent in total output. Hence, the sector has witnessed parallel relation between fixed capital deployment and output produced. For instance, in the year 2010-11, the fixed capital increased by 36 per cent as compared to last year, for the same period- the output increased by 26 per cent as compared to the previous year.

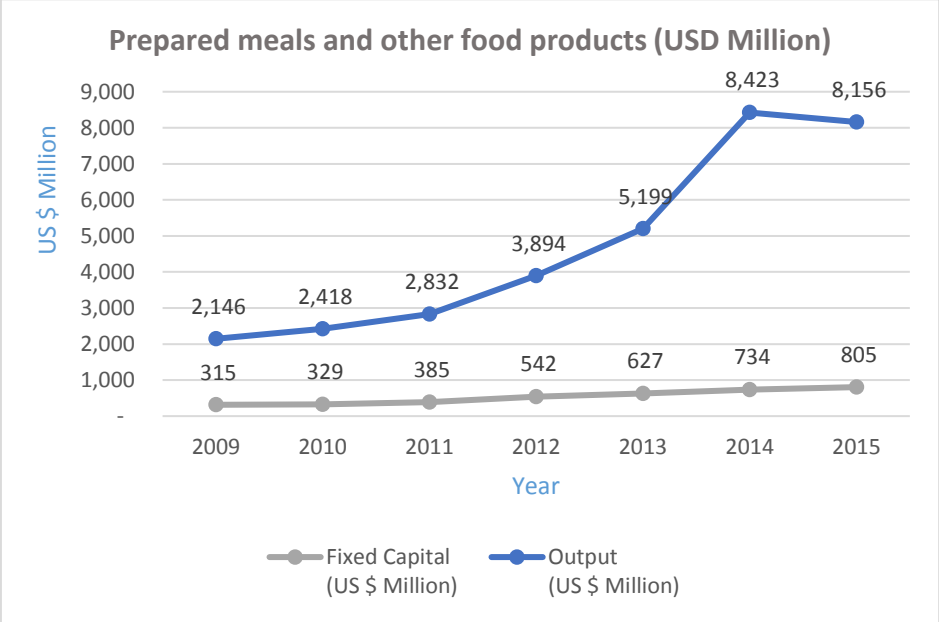


In the last seven years from 2008 to 2015, investment in plant and machinery for the segment was on an average around 78 per cent of the fixed capital. During the same period, gross value of plant and machinery witnessed compounded annual growth of 12 per cent and 5 per cent for employment.

Projecting the growth of the segment for next 10 years at the current growth rate of 12 per cent, the investment in fixed capital is estimated to be USD 6903 million by the year 2024-25. Factoring the growth for gross value of plant and machinery at 78 per cent of fixed capital, the expected size of the segment is estimated at USD 5416 million by the year 2024-25.

3.7 Prepared Meals and Dishes and Other Food Products

The sector comprising prepared meals, dishes and other food products, over the seven years, from 2008-09 to 2014-15 had a compounded annual growth rate of 17 per cent in fixed capital and 15 per cent in total output. Therefore, the sector has witnessed positive relation between fixed capital deployment and output produced.



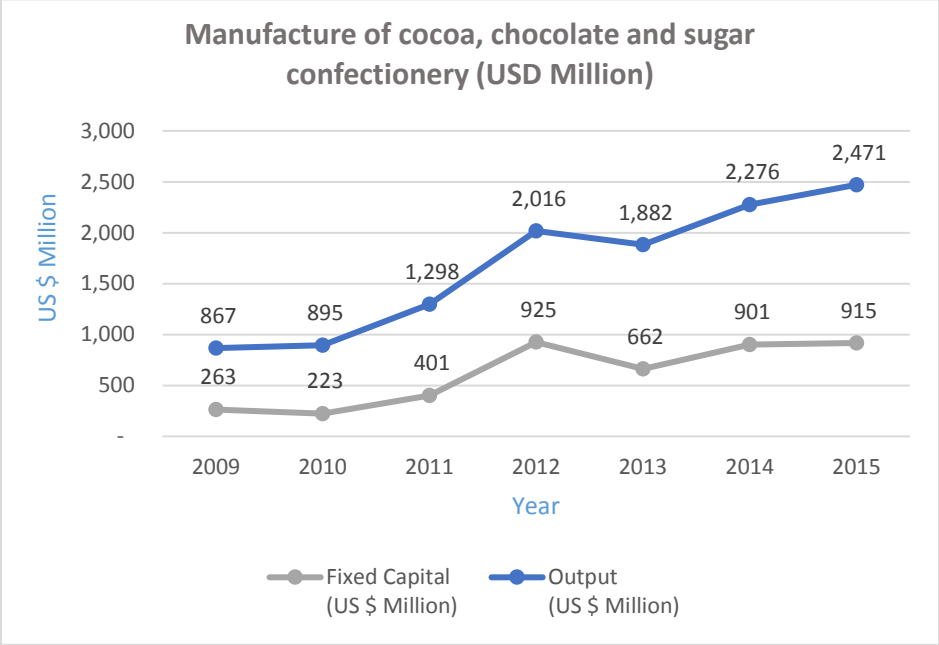
In the last seven years from 2008 to 2015, investment in plant and machinery for the segment was on an average around 67 per cent of fixed capital. During the same period, gross value of plant and machinery witnessed compounded annual growth of 10 per cent and 1 per cent for employment.

Projecting the growth of the segment for the next 10 years at the current growth rate of 17 per cent, the investment in fixed capital is estimated to be USD 12897 million by the year 2024-25. Factoring the growth for gross value of plant and machinery at 60 per cent of fixed capital, the expected size of the segment is estimated at USD 8641 million by the year 2024-25.

3.8 Cocoa, Chocolate and Sugar Confectionery

Manufacturing cocoa, chocolate and sugar confectionery sector[9], over the period of seven years, from 2008-09 to 2014-15 had a compounded annual growth rate of 23 per cent in fixed capital and 17 per cent in total output. The sector has witnessed a consistent growth rate in both fixed capital and output over the period.

In the last seven years from 2008 to 2015, investment in plant and machinery for the segment was on an average around 86 per cent of fixed capital. During the same period, gross value of plant and machinery witnessed compounded annual growth of 17 per cent and 5 per cent for employment. Hence, the sector has a strong reliance on plant and machinery and the maximum fixed capital has been deployed for the same. Also, the sector is fixed capital intensive, therefore – the cost of plant and machinery for the sector is on the higher side.

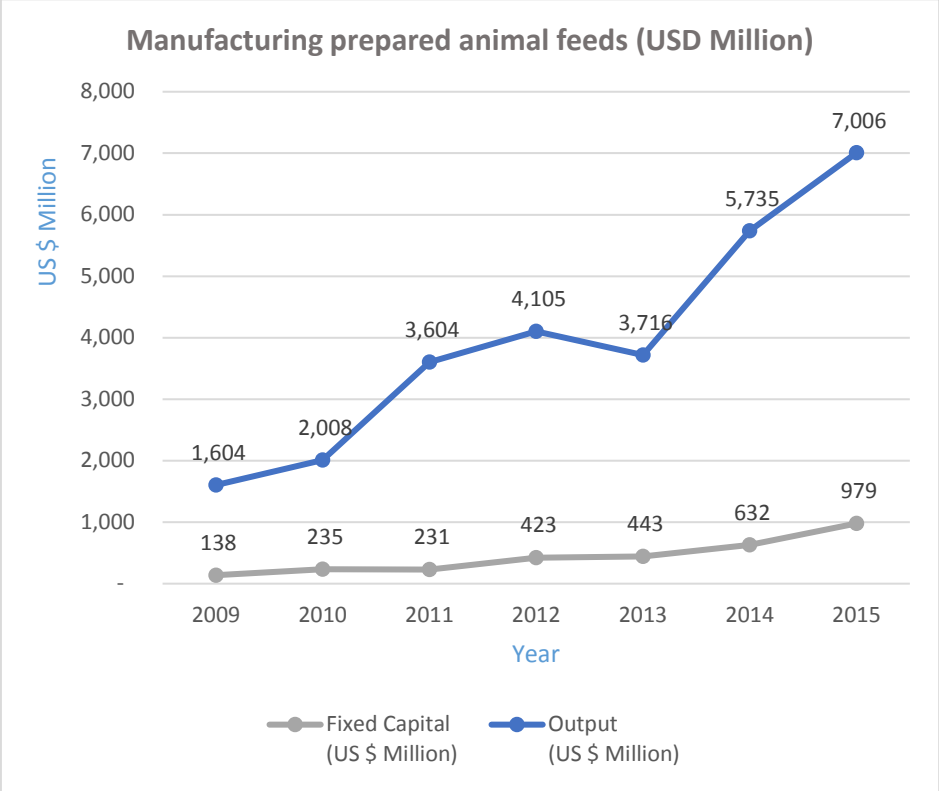


Projecting the growth of the segment for the next 10 years at the current growth rate of 23 per cent, the investment in fixed capital is estimated to be USD 7138 million by the year 2024-25. Factoring the growth for gross value of plant and machinery at 86 per cent of fixed capital, the expected size of the segment is estimated at USD 6148 million by the year 2024-25.

[9] ***Does not include NIC-1072- Manufacture of Sugar Sector***

3.9 Prepared Animal Feeds

Manufacturing prepared animal feeds sector, over the seven years, from 2008-09 to 2014-15 had a compounded annual growth rate of 28 per cent in fixed capital and 18 per cent in total output. The sector is highly capital focused and the huge deployment of capital has helped in raising the output growth rate up to 80 per cent as in the year 2010-11.



In the last seven years i.e. 2008 to 2015, investment in plant and machinery for the segment was on an average around 67 per cent of fixed capital. During the same period, gross value of plant and machinery witnessed compounded annual growth of 25 per cent and 9 per cent for employment. Hence, the sector has close dependency on both machinery and labor. Also, the increasing cost and need for plant and machinery has been observed for the sector.

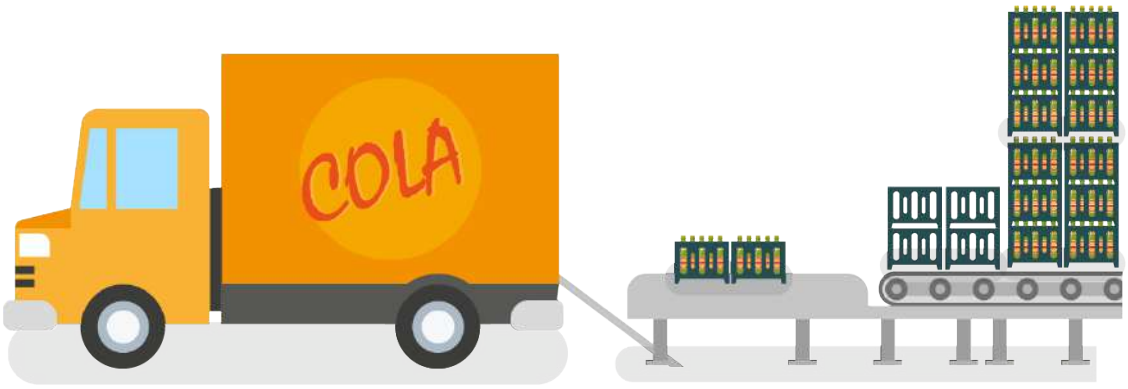
Projecting the growth of the segment for the next 10 years at the current growth rate of 28 per cent, the investment in fixed capital is estimated to be USD 11296 million by the year 2024-25. Factoring the growth for gross value of plant and machinery at 60 per cent of fixed capital, the expected size of the segment is USD 7607 million by the year 2024-25.

3.10 Infrastructure Gap

According to a study conducted by National Center for Cold Chain Development on capacity assessment of cold chain infrastructure, *All India Cold-chain Infrastructure, 2015*, there are massive capacity gaps in cold chain infrastructure in India. The study highlights the gaps in infrastructure at various levels such as modern pack house, reefer transport, ripening chambers and cold chambers. As per the study, maximum gaps exist for preservation infrastructure immediately after harvest such as pack houses (99.6 per cent gap between requirement and existing) and ripening chambers (85 per cent gap between requirement and existing) followed by transportation infrastructure of reefer transport (91 per cent gap between requirement and existing).

Table 7: All India Gap Assessment in Cold Chain Infrastructure[10]

Type of infrastructure	Total Requirement (A)	All India Existing (B)	All India Gap (A-B)	Per cent share of Gap to Required
Modern pack house	70080 units	249 units	69831 units	99.6 per cent
Reefer Transport	61826 units	9000 units	52826 units	85 per cent
Ripening Chambers	9131 units	812 units	8319 units	91 per cent
Cold Chamber (Bulk)	34164411 MT	31.82 MT	3. 276962 MT	10 per cent



[10] NCCD.2015 All India Cold-chain Infrastructure Capacity (Assessment of Status & Gap), Delhi

3.11 Strong Demand and Growth opportunities for the Equipment Manufacturers

It is estimated that the gross value of plant and machinery deployed in food processing sector, by the year 2024-25 will be USD 51.19 billion.

The large contribution to this market size are cereals processing, dairy processing, prepared meals and all other food products.

Sectors	Fixed Capital (USD mn) 2016-17	GV of Plant & Machinery (USD mn) 2016-17	Fixed Capital (USD mn) 2024-25	GV of Plant & Machinery (USD mn) 2024-25
1. Dairy products	3606	2353	9816	7951
2. Processing and preserving of fruit and vegetables	946	721	1774	1152
3. Cereal processing : grain mill products, starches and starch products bakery products	5977	3253	16647	8990
4. Processing of Vegetable and animal oils and fats	2710	2668	3749	3264
5. Processing and preserving of meat fish, etc	1084	637	3572	2250
6. Soft drinks, mineral waters and other bottled waters	2833	2213	6903	5416
7. Prepared Meals and other food products	3757	2247	12897	8641
8. Cocoa, chocolate and, sugar confectionary	1381	2213	7138	6148
9. Prepared animal feeds	1597	1018	11296	7607
Total	**23,890**	**17,323**	**73,792**	**51,419**

4 Government Policy Support Aiding Growth

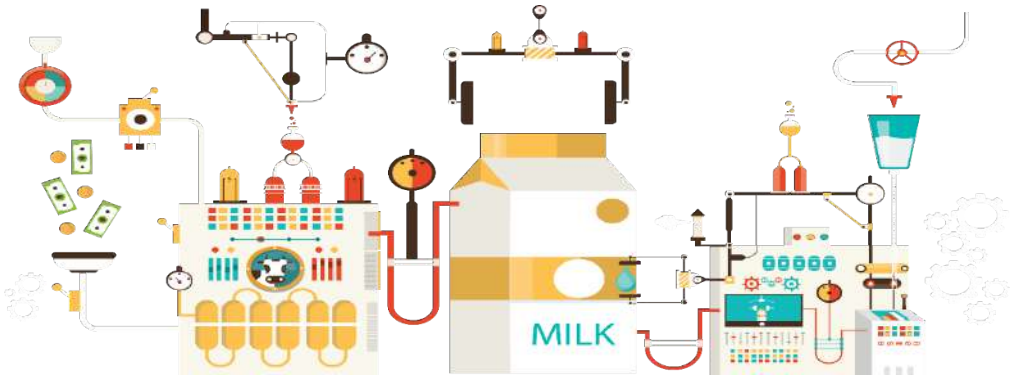
The Ministry supports the sector with financial incentives in the form of grants and low-cost credit for the sector that acts as a catalyst and encourages investment.

This chapter outlines the initiatives by the Government of India to support the food processing sector.

4.1 Foreign Direct Investment in Food Processing

To provide impetus to investment in food processing and retail sector, the Government of India has allowed 100 per cent FDI in food processing comprising sub-sectors like warehousing, storage and transportation for cold chains, trading comprising e-commerce, with respect to food products manufactured and / or produced in India. Also, the Government has allowed 100 per cent FDI in marketing of food products, produced and manufactured in India.[11] These initiatives have opened up vast opportunities for foreign industry players and has boosted the business environment and investment climate in the sector in India.

Details of Make in India initiative and support for manufacturing in India can be accessed at, Make in India: http://www.makeinindia.com/about .



[11] http://mofpi.nic.in/sites/default/files/databank.pdf

4.2 Credit Infusion

Food and agro-based processing units and cold chain infrastructure have been brought under the ambit of Priority Sector Lending (PSL) to provide an additional credit for the food processing activities and infrastructure. Thereby, boosting food processing, reducing wastage, creating employment and increasing the farmers' income. Loans to food and agro-based processing units and cold chains have been classified under agriculture activities for PSL as per the revised RBI Guidelines[12] issued dated 24 March 2015.

The Government has set up a Special Fund of INR 2000 crore (USD 300 million), in National Bank for Agriculture and Rural Development (NABARD) to make low cost credit available to designated food parks and agro processing units in the designated food parks. There is a Special Fund for INR 5000 Crores (USD 750 million), to support infrastructure creation for the storage of agricultural commodities (min 5000 MT).

[12] http://pib.nic.in/newsite/PrintRelease.aspx?relid=159621

4.3 Grant Support

4.3.1 Pradhan Mantri Kisan Sampada Yojana (PMKSY)

The Ministry has approved a new Central Sector Scheme - SAMPADA (Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters) for the period 2016 to 2020. It is expected to facilitate handling of 334 lakh MT agro-produce by the year 2019-20.[13]

Financial Package: PMKSY scheme has an allocation of INR 6,000 crore (USD882 million) for the period 2016-20 and it is expected to leverage investment of INR 31,400 crore (USD 4.71 billion) through this scheme in the food processing sector.

PMKSY is an umbrella scheme, incorporating the ongoing schemes and the new schemes of MoFPI to support the sector. It is a comprehensive package to give a renewed thrust to the food processing sector in the country.

PMKSY is supporting the ongoing schemes for Mega Food Parks, Integrated Cold Chains and Value Addition Infrastructure, Food Safety and Quality Assurance Infrastructure. There are several new schemes introduced under PMKSY encompassing Infrastructure for Agro-processing Clusters, Creation of Backward and Forward Linkages, Creation or Expansion of Food Processing and Preservation Capacities. These schemes are aimed at the development of modern infrastructure to encourage entrepreneurs to set up food processing units based on cluster approach. Furthermore, these schemes provide effective and seamless backward and forward integration for processed food industry by plugging the gaps in supply chain and creating processing and preservation capacities along with the modernization or expansion of existing food processing units. The implementation of PMKSY will result in the creation of modern infrastructure with efficient supply chain management from farm gate to retail outlet. There are seven major schemes under PMKSY[14], mentioned in detail in the table below. In addition to the various schemes of MoFPI, there are other agencies, which provide a number of grants to the sector.

[13] http://pib.nic.in/newsite/PrintRelease.aspx?relid=161512
[14] http://www.mofpi.nic.in/sites/default/files/important_notice-sampada-19.05.2017.pdf

Grant support for the food processing sector: Ministry of Food Processing Schemes (PMKSY)

#	Name of Schemes	Schemes targets upto Year 2019-20		Pattern of support under the scheme
		Allocation (INR Crores)	**No of Projects**	
1.	Mega Food Park (Ongoing)	1500 (USD 2.34 Million)	42	• one time capital grant of 50 per cent of the project cost (excluding land cost) subject to a maximum of INR 50 crore in general areas and 75 per cent of the project cost (excluding land cost) subject to a ceiling of INR 50 crore in difficult and hilly areas. (USD 7.5 million)
2.	Integrated Cold chain and Value addition infrastructure (Ongoing)	1650 (USD 2.58 Million)	150	• grant-in-aid of 50 per cent the total cost of plant and machinery and technical civil works in general areas and 75 per cent for difficult areas subject to a maximum of INR10 crore.(USD 1.5 million)
3.	Creation/ expansion of processing & preservation facilities (New)	1290 (USD 2.02 Million)	400	• 35 per cent of the total project, max INR 5 crores (USD 0.75 million) in General areas • 50 per cent of the total project, max INR 5 crores (USD 0.75 million) in difficult areas
4.	Infrastructure for agro-processing clusters (New)	750 (USD 1.17 Million)	100	• INR 10 crores (USD 1.5 million) grants-in-aid @ 35 per cent of eligible project cost in general areas and @50 per cent of eligible project cost in the North East States including Sikkim and difficult areas • Requires minimum investment INR 25 crores (US$ 3.75 million) and at least 5 units
5.	Creation of backward and forward linkages (New)	150 (USD 0.23 Million)	50	• 35 per cent of the total project, max INR 5 crores (USD 0.75 million) in general areas • 50 per cent of the total project, max INR 5 Crores (USD 0.75 million) in difficult areas
6.	Food Safety and quality assurance scheme (Ongoing)	165 (USD 0.26 Million)		• grant-in-aid of entire cost of laboratory equipment required for laboratories • 25 per cent of the cost of technical civil works to house the equipment

			and furniture and the fixtures associated with the equipment for general areas and 33 per cent for difficult areas
7.	Human resources & institutions (ongoing)	285 (USD 0.45 Million)	

MoFPI's capital grant under PMKSY is one of the key drivers to facilitate investment in the food processing sector in India. The Government grants are mainly aimed towards reducing the cost of plant and machinery and technical civil work. For a food processing project, the cost of plant and machinery contributes towards a major share of the total project cost, roughly 70 per cent of it. With an assumption that the Government gives an average grant of 25 per cent of the total project cost, it is estimated that every dollar spent on grants induces an investment of 2.8 dollars on plant and machinery. Therefore, PMKSY, with an allocation of INR 6,000 crore (USD 882 million) by the year 2019-20, will induce an investment of INR 16,800 Crores (USD 2.5 billion) in plant and machinery during this period. This provides a huge opportunity for the equipment manufacturers.

Similarly, there are many other schemes by the Government of India implemented through various agencies which have similar features of grant support for the sector.

What is in it for the equipment manufacturers?

Government subsidy linked projects are direct opportunity for equipment manufactures as most of these projects are new and are related to encouraging investments in plant and machinery.

4.3.2 Other Organizations Offering Grant Support

A summary of schemes supported by other Government organizations for creation of cold chain infrastructure and other incentives to support food processing sector are given in the table below.

Grant support for the food processing sector: Schemes from other Government agencies

	Agencies	Pattern of assistance
1	National Horticulture Board (NHB) - Capital Investment subsidy for construction/expansion/ modernization of cold storage for Horticulture Products	• subsidy for cold storage is upto 40 per cent of the project cost subject to ceiling INR 30 lakhs (USD 40,000) whichever is lower
2	National Horticulture Mission (NHM)	• subsidy for cold storages to the extent of 35 per cent of the eligible project cost subject to an ceiling of INR 2.1 crore (USD 0.31 million)
4	Agricultural and Processed Food Products Export Development Authority (APEDA)	• The food processors can get up to 40 per cent of the cost of the cold storage infrastructure, subject to limit of INR 0.75 crores (USD 110,000) in the period of 5 years.
5	NABARD	• Dairy Entrepreneurship Development Scheme: capital subsidy of 25 per cent of the project outlay, interest free loan for 50 per cent of the project outlay and 50 per cent interest subsidy for the bank loan taken for balance outlay of the project.
6	Venture Capital by Small Farmer Agri-Business Consortium (SFAC)	• To meet the funding gap in the means of finance for FPOs, to be refunded to SFAC after payment of the term loan • 2012-2017, INR 302 crores (USD 44 million) has been given in assistance to over 1000 projects and facilitating investments over INR 3650 crores (USD 538 million).
7	Ministry of Micro, Small and Medium Enterprise Credit Linked Capital Subsidy Scheme (CLCSS)	• On purchase of plant and machinery worth INR 1 crore (USD 0.15 million), given assistance of 15 per cent i.e. INR 15 lakh (USD 22,500).
8	Horticulture Mission for North Eastern Region and Himalayan States (HMNEH)	• The assistance is for up to 50 per cent of the eligible project cost with a ceiling of INR 4 crores (USD 0.6 million)

Annexure 1: Imports in Food Processing Equipment

The table below exhibits the five year data (Department of Commerce) on import of Food Processing and Dairy Equipment (with classification code). Values in INR Lakhs

S.No.	HSCode	Commodity	2016-2017	2015-2016	2014-2015	2013-2014	2012-2013
1	84381010	BAKERY MACHINERY	10,320.54	11,201.99	8,549.06	10,759.08	16,013.90
2	84381020	MCHNRY FR MNFCTR OF MACARONI/SMLR PRDCTS	4,725.34	1,311.68	6,398.63	4,246.40	2,613.93
3	84382000	MACHINERY FOR THE MANUFACTURE OF CONFECTIONERY,COCOA OR CHOCOLATE	9,612.95	36,548.61	31,117.82	25,754.09	19,460.06
4	84383010	SUGAR CRANE CRUSHERS	4.01	5.83	72.87	34.64	70.92
5	84383090	SUGAR MANUFACTURING MCHNRY(EXCL CNTRFGS)	1,365.15	2,157.87	3,984.82	2,240.93	3,565.43
6	84384000	BREWERY MACHINERY	2,725.23	2,351.55	348.76	2,664.99	1,310.92
7	84385000	MCHNRY FOR PRPRTN OF MEAT/POULTRY	1,644.33	6,373.80	3,906.75	4,255.71	4,585.32
8	84386000	MCHNRY FR PRPRTN OF FRUITS,NUTS/VGTBLS	9,549.69	10,562.05	6,890.44	6,791.23	6,677.95
9	84388010	AUXILIARY EQPMNTS FR EXTRUSION COOKNG PLNT	311.28	1,922.27	1,077.43	670.57	908.72
10	84388020	MCHINERY FOR PRODUCTION OF SOYAMILK OR OTHER SOYA PRODUCTS(EXCEPT SOYA OIL)	76.85	715.78	2,457.61	184.75	33.4

S.No.	HSCode	Commodity	2016-2017	2015-2016	2014-2015	2013-2014	2012-2013
11	84388030	DIFFUSING MACHINES (DIFFUSORS)	39.74	19.27	2.36	45.35	5.62
12	84388040	TEA LEAF ROLLING OR CUTTING MACHINE	184.89	26.59	102.14	54.3	513.7
13	84388090	OTHERS	41,925.90	27,995.57	30,865.22	22,154.92	28,878.01
14	84389010	PARTS OF SUGAR MANUFACTURING MACHINERY	543.78	2,871.48	1,455.63	637.72	175.67
15	84389090	PARTS OF OTHR FOOD PROCESSING MACHINERY	14,015.48	16,073.22	16,146.93	13,693.27	14,246.20
16	8434	MILKING MACHINES AND DAIRY MACHINERY	10,717.50	14,036.30	17,949.53	12,376.26	8,846.60
Total of Food Processing	8438	MCHNRY,N.E.S.,FR INDSTRL PRPTN/MNFCTR OF FOOD/DRNK,EXCL MCHNRY FR EXTRCTN/PRPRTN OFANML/FXD VGTBL FATS/OILS	97,045.16	120,137.56	113,376.47	94,187.95	99,059.74

Annexure 2: List of Equipment Manufacturing Companies in India

Annexure 2 provides a concise list of companies, both international and Indian arranged according to the major segments in which the equipment are used for the processing of food products, for the purpose of segmentation. For presentation purposes, the list is divided into global and Indian companies under each segment. The list is only for representation and is not exhaustive in nature. The information and facts provided with regard to these firms is captured from respective websites.

Annexure 2A: Dairy Sector

Milk and milk products – Global companies

Name	Brief Profile
GEA **(Germany)**	GEA Process Engineering Ltd., operating as a subsidiary of the GEA Group, is one of the largest global dairy equipment manufacturers in India and provides complete solution to the dairy industry in the country. It is present across the product range in the sector including evaporation and crystallization plants, paddle dryers, column dryers and coolers, ring dryers, and flash dryers for chemical, fertilizer, and petrochemical industries, cream processing units, evaporators, and milk reception units for dairy industries; and batch plant rays, freeze dryers, fluid bed dryers, and spray dryers etc. Website: http://www.gea.com/
Alfa Laval **(Sweden)**	Alfa Laval entered the Indian market in 1937 and have been providing solutions to various industries including food, dairy and beverage and marine industry through its Indian arm Alfa Laval India Limited. It is headquartered in Pune with five manufacturing units and 14 sales unit across the country. Alfa Laval´s operations is based on three key technologies: heat transfer, separation and fluid handling. Alfa Laval´s business is divided into three divisions covering Energy, Food &Water, and Marine. For dairy industry, it provides various solution specializing in Cheese processing, Ice cream processing, Milk and cream processing, Whey casein and Lactose processing, Yogurt and Cultured Milk processing. Website: http://www.alfalaval.in/
Tetra Laval International **(Switzerland)**	Tetra Laval Group consists of three industry groups, Tetra Pak, Sidel and DeLaval, all focused on technologies for efficient production, packaging and distribution of food. While DeLaval is more focused on dairy farming and animal husbandry, Tetra Pak is focusing on processing and packaging technologies. Tetra Pak operates in more than 175 countries around the world. In India, Tetra Laval, operates through, Tetra Pak India Pvt. Ltd. It has two major domains; processing and packaging for application processing of dairy processing, beverages processing, prepared food processing, Ice cream processing, Cheese and Whey processing. It is a pioneer of packaging and key work domains are manufacturing of Filling Machines, Downstream Equipment, and Automation. Website: http://www.tetrapak.com/in

Milk and milk products – Indian Firms

Name	Brief Profile
IDMC Limited	IDMC Ltd. provides diversified services as an equipment manufacturing and project engineering company. The Company offers services in process automation, fabrication, manufacturing, designing, and marketing of process equipment. Some of the major machineries tankages, process vessels, plate heat exchangers, flow items and specialized key process equipment. IDMC Limited was set up in 1978 to manufacture dairy components and equipment and to contribute in moderating their prices. IDMC was incorporated as a wholly owned subsidiary company of the National Dairy Development Board (NDDB) in 1992. IDMC's major activities are Supply, Installation, Testing and Commissioning (SITC) of projects in the Dairy, Pharmaceuticals, Beverages sector and Thermal Management Systems. IDMC forayed into turnkey projects for setting up cattle feed plants in 2011. Website: http://idmc.com/index.php
Unicorn Industries Limited	Unicorn Industries Ltd, established in 1974 manufactures and trades for equipment in Dairy, Food, Beverage, and Pharmaceutical and Allied Process Industries. Some of the major machineries are Brewery Fermenter, Sugar Syrup Preparation System, Pipe Rack Structures, Ghee Machine and Equipment, Liquid Dumping Station, CIP System, Automatic Pasteurizer, Agitator Vessels. Website: http://idmc.com/index.php
SSP Pvt Ltd	SSP is a process engineering company offering equipment and process solutions in the Food, Dairy, Beverages and Chemical Industries. The company was established in 1977. Major product categories of SSP are Dairy Industry, Instant Coffee & Instant Tea, Starch & Derivatives, Fruit & Vegetables, Nutraceuticals & Protein Food, Edible and Pharma Grade Salt, Dairy Alternatives, Egg/ Honey Processing Plant. Website: http://www.sspindia.com/about-us.html

Annexure 2B: Fruits and Vegetables

Fruits and Vegetable Processing – Global firms

Name	Brief Profile
Atlas Pacific Engineering Company **(USA)**	Atlas Pacific Engineering Company, Inc, established in 1945, is a global leader in the fruit processing industry, offering a full line of fruit processing machinery. They work under three different businesses, Magnuson Corporation, Luthi Machinery Company and Brown International Corporation, each operating in different product segment. Magnuson product lines include Peelers, Feeders, and Corn Processing Equipment (CCM - Computer Controlled Machines). Luthi Machinery is mainly in can filling technology for the tuna industry, offering machines for solid pack, chunk, or flake, specializing in leased and sold filling equipment for the chunk and solid pack. Brown's citrus system typically include extractors, finishers, by-product recovery systems and plant processing control and information systems; with non-citrus processing solutions include Extractors, Finishers, Pulpers, Classifiers, Separators, De-waters and Refiners. It does not have a manufacturing plant in India. Most of the machinery in India are imported. Website: https://www.atlaspacific.com/
Bucher (Switzerland)	The Bucher Group is present in India with Bucher Hydraulics Pvt. Ltd and has its production facility in Manesar, Haryana. Bucher Hydraulics is a leading international manufacturer of advanced hydraulic systems which customers all over the world integrate into their products. The group overall comprises four specialized divisions in industrially related fields of mechanical engineering and vehicle construction as well as an area with independent individual transactions. It is one of the world's leading supplier of specialized agricultural machines for soil cultivation, sowing technology, fertilization, plant protection and landscape maintenance, animal feed and feeding technology. Website: http://www.bucherindustries.com/en/divisions/bucher-specials Website: http://www.bucherindustries.com/en/about-us/locations
Heat and Control (USA)	Heat and Control is one of the world's leading manufacturers of food processing, seasoning, conveying, packaging and inspection equipment systems. In India, they are present as Heat & Control South Asia Private Limited. They manufacture a wide range of equipment across the value chain of food processing. They provide complete solutions in: Process Prepared Systems, Packaging Systems, Snack Systems, French Fry Systems, Product Handling Systems, Inspection Systems and Control Automation System. Website: http://www.heatandcontrol.com/contact.asp

Fruits and vegetable processing – Indian Firms

Name	Brief Profile
Bajaj Processpack	Bajaj Processpack was established in 1988 as a food processing and packaging company. It manufactures and provides turnkey solutions in equipment for fruits, vegetables and beverages for small and medium level processing units. Equipment for processing of fruits and vegetables include pulp, puree, paste, juice concentrates, jams, juices, ketchup, dehydrated fruits and vegetables and end-packaging in cans, bottles and pouches. Website: http://www.bajajmachines.com/
Economode Food Equipment	Economode Food Equipment established in the year 2001, manufactures automatic machines. Processing lines- fully automatic potato chips line and fully automatic nik-nak (corn and rice puff) and namkeen /ethnic snacks production lines, peak performing continuous frying systems and batch frying systems and extruders such as cheese ball extruders, kurkure extruders etc. Website: http://www.economode.in/
MAZDA Speciality Machine Systems,	Mazda group which is Mumbai based, manufactures food and beverage processing plants, including design, fabrication manufacture and installation. The group's production scope includes specialized manufacturing facilities in India and with collaborators, associates in Europe. Their specializations include: French Fries / Potato Products plants, Tomato Paste and Ketchup Plants, Fruits extractions plants- juices, purees, pulps, Frozen Fruits and Vegetables, Cold Chain elements. Including Aseptic Packaging and Storage, Meats and Sea Food projects, RTE Food Projects. Website: http://www.mazmach.com/index.html

Annexure 2C: Cereals Processing

Cereals Processing (rice/ pulses/ millets etc) – Global firms

Name	Brief Profile
Buhler AG (Switzerland)	Buhler entered Indian market in 1992 with Buhler India Pvt Ltd, a 100 per cent subsidiary of its parent firm with an investment of USD 1.34 billion for manufacturing food processing equipment. Buhler India Pvt Ltd provides integrated process solutions along the entire industrial food manufacturing production chain. Its manufacturing plant in India is based in Attibele, near Bangalore and has sales offices in 8 cities in India. Buhler India is primarily recognised as a leading supplier of equipment for rice milling, flour milling, colour sorting, animal feed technology, oil milling, grinding and dispersion technology and die casting systems. In line with Buhler's global strategy, Buhler India intends to sharpen its focus on rice processing segment, in which it is already a market leader. Consolidation of over 40,000 small commercial rice processors into larger operating units is expected to happen over the course of time, which presents a lucrative business opportunity for Buhler India. Website: http://www.buhlergroup.com/global/en/home.htm#.WagwsrIjHIU
Satake Corporation (Japan)	Satake India Engineering is a 100 per cent subsidiary of Satake Corporation, Japan. Satake commenced its operation in India in the year 1996. Satake produces individual machines, integrated systems and engineered solutions for the processing of rice, wheat and other grains. It works in design, supply, installation and commissioning of machinery for food industry like Rice, Wheat Flour, Maize and Lentils, etc. They have commissioned more than 150 modern Rice Milling plants and over 700 Color Sorters. Website: http://www.satakeindia.com/
ANKO Food Machine (Taiwan)	ANKO Food Machine Co., Ltd. is a leading company in Taiwan food machine industry, offering a wide range of food equipment. They supply their machines to more than 109 countries across the globe. ANKO prdocuts range from frozen food machines to specialized bakery machineries such as Puff pastry, Mammoul, Burrito, Bliny, Apple pie, Cinnamon Roll, machines for seafood and meat value added products. In addition to individual machines, ANKO provides turnkey project from factory planning, raw material processing, production line planning, production process optimization, new product development and customization. For Indian market, they provide automatic machineries for a large number of Indian food products ranging from lachchha parathas to samosas, dumplings, namkeen and peda etc. Website: https://www.anko.com.tw/en/country/IN.html

Cereals Processing (rice/ pulses/ millets etc) –Indian Firms

Name	Brief Profile
Sifter International	Sifter International was established in 1978. Starting with manufacturing of the cleaning and grading equipment for grain processing industry, Sifter is manufacturing equipment across a range of products. Sifter International deals in food processing machines, turnkey project solutions food processing plants, food packaging plants and machineries as well as exports the equipment and turnkey solutions. It is executing project for flour mill, rice mill, spice plant, cleaning and grading plant, solvent extraction plant, maize mill, cornflakes plant, tomato processing plant, different industrial dryer, guar gum plant, fruit and vegetable processing plant, dehauling of seeds etc. Website: http://www.sifterinternational.com/index.php
E S Food Technologies Pvt Ltd	E & S Food Technologies Pvt. Ltd. was established in the year 2012. It manufactures range Food Processing Machine, Storage Silos, Spiral Conveyor, Pasta Machines and Snacks Dryers, Cookies Making Machine, Material Handling Station System, Food Processing Machinery, Snacks Stamping Machine, Pasta Machine, Spiral Conveyor, Stuffing Machine, Macaroni Making Machine, Storage Silos, Dryer Machine, Automatic Pasta Lines Machine, Pasta machine Die and Inserts. Website: http://www.esfoodtechnologies.com Website: http://www.esfoodtech.com/
Indopol Food Processing Machinery Pvt. Ltd.	Indopol Food Processing Machinery is an independent family-run business group operational since 1983 and manufactures various types of cereal milling machinery and accessories, ready-to-eat energy foods as well as provides technical consulting for food processing; import and export. The company specializes in flour and rice milling. Some of its products are Roller Flour Mills, Hi-tech Rice Cleaning, Parboiling and Drying, Milling and Grading Plants, Blended Cereal Foods and Food Extrusion Systems, Pulses Cleaning, Grading and Milling Plants, Spices Grinding and Grading Plants, Other Food Processing Machinery Solutions, Automation and Systems Controls for Food Processing Systems. Website: http://www.indopol.com Website: https://www.zaubacorp.com

Annexure 2D: Poultry, Fishery and Meat Processing

Poultry, Fishery and Meat processing – Global Firms

Name	Brief Profile
Meyn (Netherlands)	Meyn Food Processing Technology B.V is a subsidiary of CTB Inc. CTB, Inc. is a leading global designer, manufacturer and marketer of systems and solutions for preserving grain; producing poultry, pigs and eggs; processing poultry; and for various equestrian and industrial applications. Founded in 1952, they have been a Berkshire Hathaway company since 2002. They operate from facilities located around the globe and through a worldwide network of independent distributors and dealers. Website: https://www.meyn.com/
Marel (Iceland)	Marel is the leading global provider of advanced equipment, systems and services to the fish, meat and poultry industries. Marel India was established in 2012 and is part of the Marel global sales and service network operating in over 30 countries and 6 continents worldwide. The main office for Marel India is located in Bangalore. There are also service departments in Bangalore and on the west and east coasts of India. Website: http://marel.in/
Jarvis Products Corporation (USA)	Jarvis Products Corporation manufactures specialized machinery for meat processing industry especially meat cutting and boning machinery, including band saws, slaughter equipment, carcass opening and splitting saws, hock cutters, and skinning machines as well as other power tools for the poultry and fish processing industries. Jarvis equipment is sold and serviced worldwide through different branch locations and Jarvis' J26 Federation of Distributors. Jarvis Equipment Pvt Ltd, India, wholly owned subsidiary of Jarvis Products Corp., located in Delhi, NCR region is a single point of contact for their customers in India and neighbouring countries dealing in sales and service of Jarvis tools. Website: http://www.jarvisproducts.com/ Website: https://www.jarvis.co.in/

Poultry, Fishery and Meat processing – Indian Firms

Name	Brief Profile
RND AUTOMATION PVT. LTD.	RND Automation Pvt. Ltd design, manufacture and customize Poultry and Meat Processing Equipment. The company manufactures from semi-automatic de-feathering plants to automatic conveyorized plants for processing between 300/hour to 4000 birds/hour, utilized by both small scale and large scale processors and integrators. RND has Global Presence spread across; Belgium, Bangladesh, Sri Lanka, Abu Dhabi, Nepal, Libya, Nigeria, Sudan, Kenya, Surinam, and Myanmar. Website: http://www.rndautomation.co.in/
Frick India	Frick India manufacture, package, install and service tailor-made refrigeration system for quick freezing and low temperature storage of Meat and Poultry Industry and Sea Food Products. Frick India offers fully automated refrigeration solutions such as Quick Chilling Rooms, Water Chillers, Pre-Chillers, Blast Freezers (up to -50 °C), Plate Freezers, Low Temperature Frozen Chambers, and Cold Storage, Chilled rooms, Water Chillers, Pre Chillers, IQF, Flake Ice Machine, Low Temperature Frozen Chambers, Ice Production and Storage etc. Website: http://www.frickweb.com/meat.aspx

Annexure 2E: Ready to Eat Food (RTE) and Packaging

Ready to Eat Food (RTE) and packaging – Global firms

Name	Brief Profile
John Bean Technologies Corporation (JBT)	John Bean Technologies Corporation (JBT) is a leading global technology solutions provider to high-value segments of the food processing and air transportation industries. Globally, JBT Food Processing products include: • Freezer solutions for the freezing and chilling of meat, seafood, poultry, ready-to-eat meals, fruit, vegetable and bakery products • Protein-processing solutions that prepare, portion, coat and cook poultry, meat, seafood, vegetable and bakery products • Shelf-stable sterilization solutions for fruits, vegetables, soups, sauces, dairy and pet food products, as well as ready-to-eat meals in a wide variety of modern packages • Fruit and juice processing solutions that extract, concentrate and aseptically process citrus, tomato and other fruits. • High Pressure Processing (HPP) solutions for ready-to-eat and ready-to-cook meats, ready-meals, fruits and vegetables, juices and smoothies, soups and sauces, wet salads and dips, dairy products, seafood and shellfish. JBT FoodTech Pune, Indian arm of JBT is mainly in Citrus Processing, Fruit and Vegetable Processing, Aseptic Filling, Filling, Closing, Sterilization, Freezing and Chilling, Proofing, Refrigeration, Portioning, Slicing, Coating, Frying and Filtration, Cooking, Process and Line Control, Pasteurization. Website: http://www.jbtfoodtech.com/
Rheon Automatic Machinery Co., Ltd. (Japan)	Rheon Automatic Machinery is into automatic production of traditional foods from throughout the world. Rheon has been developing, manufacturing and supplying a wide range of high quality food processing machines, and factory systems. They are the world's first developer of fully automated croissant production line and automatic filled product machine. They export to over 120 nations. Website: www.rheon.com/index.php
The Middleby Corporation (USA)	The Middleby Corporation is a global leader in the foodservice equipment industry. The company develops, manufactures, markets and services a broad line of products. The company manufactures commercial cooking equipment, industrial processing equipment, and residential appliances. Middleby Corp claims that every third restaurant uses its equipment. Website: http://www.middleby.com/

Ready to Eat Food (RTE) and Packaging – Indian Firms

Name	Brief Profile
Nichrome	Nichrome, established in 1948 provides packaging solutions for specific product lines with its high quality and flexible machine lines ranging from its food packaging machine lines to its liquid packaging machine product lines. Nichrome's variant of the Pick-Fill-Seal Machine with designed RTE fillers are used to quickly pack a wide variety of ready-to-eat and ready-to-cook foods. Website: http://www.nichrome.com/
Kanchan Metals Pvt Ltd	Kanchan Metals Pvt Ltd is a Private incorporated in1984 manufactures equipment and provides solutions to food processing companies in India. Kanchan Metals have three types of food processing equipment – a. Continuous Namkeen Extruders, b. Belt Conveyors, c. Forced Air Coolers, d. Seasoning Drum, e. Bucket Elevator. Their major equipment work includes Snack Food Manufacturing Equipments, Meat Processing, Bakery, Confectionery, Wafers and Instant Foods, Packaging and Hygiene. Website: http://snackfoodmachines.com/
Sanjivan Industries	Sanjivan Industries is a Food Processing Products Manufacturer and Supplier. The company offers a range of sweet making machines, Kalakand Kadai, Boiling Kettles, Namkeen Making Machines, Namkeen Plant, Food Processing Machines and Dal Frying Kadai. The company was established in 1996. Website: http://www.sanjivanindustries.com

Annexure 2F: Refrigeration Solution Equipment Manufacturers

Refrigeration Solution Equipment Manufacturers -Global firms

Name	Brief Profile
Dover Corporation **(USA)**	Dover India Pvt. Ltd. operates as a subsidiary of LTX-Credence Corporation. Dover India Pvt. Ltd. is engaged in the design and manufacture of products and components for communications, life sciences, aerospace/industrial, and defence markets. The company also provides engineered solutions for the extraction and handling of critical fluids for drilling, production, and downstream oil and gas markets, including power generation worldwide. In addition, Dover India Pvt. Ltd. offers engineered systems for fluids systems, refrigeration and food equipment, waste and recycling, and industrial markets. Further, it provides integrated printing, coding, and testing solutions for consumer goods, food, pharmaceutical, industrial, electronics, and alternative energy markets. Website : https://www.dovercorporation.com/in
HRS Process Systems Limited	HRS Process Systems Limited is a part of HRS Group, which operates for thermal processing technology and is one of Europe's leading heat exchanger manufacturers for multiple sectors. HRS in Food Processing Industry has equipment for design, manufacture and installation of complete heat treatment systems for the Food Industry for aseptic filling, hot filling or any other form of filling. Other offered solutions for the food processing industry by HRS Process Systems are system integration of pumps, tanks, heat exchangers, aseptic fillers, piping, and controls etc. Website: https://www.hrsasia.co.in/

Refrigeration Solution Equipment Manufacturers -Indian Firms

Name	Brief Profile
Industrial Refrigeration (IR)	Industrial Refrigeration (IR) was founded in 1958. IR started progressing in Food Refrigeration post 1990s and over the years gained experience in Ice Making Machines, Freezing Plants, Chillers and Cold Storages for temperatures in the range of + 5°C to - 40°C and for applications ranging from Storage of Films to Storage of Seafood. Over the years IR entered into several tie-ups with Global Companies like GEA group to introduce the latest refrigeration technologies and practices in India such as: Paraffin Wax Freezers for Refineries, Snow Rooms, Ice Skating Rinks, Dairy Refrigeration, Abattoir Refrigeration and Modified and Controlled Atmosphere Cold Stores. Website: http://www.irl.co.in/
BRIGHT INTERNATIONAL	BRIGHT INTERNATIONAL is known as a manufacturer, supplier and exporter of Industrial Refrigeration Equipment. Their main products are Ice plant, Cold storage, chilling plant, freezing plant & spare parts, Chiller and Condenser, Chilling Unit, Cold Storage and Food processing machinery, Compressor and its Spare parts, Condensing and Cooling Coil, Cooling Tower, Ice Plant, Industrial Valves. Website: http://www.brightengineersindia.com/foodprocessing.html

Annexure 3: Methodology for Estimation of Market Size

- NIC classification and data analysis for market size calculation

	Sub-Sectors	NIC Classifications
1	Dairy (Milk and Milk Products)	1050
2	Fruits and vegetable processing	1030
3	Cereal processing	1061, 1062, 1071, 1074
4	Vegetable oil, animal oil and fat processing	1040
5	Meat and meat products	1040, 1020
6	Soft drinks, mineral water and other beverages	1104
7	Prepared meals and other food	1075, 1079
8	Sugar and sugar based confectionaries including cocoa	1072, 1073
9	Animal feed processing	1080

- Each of the subsectors mentioned above are analyzed on three indicators- fixed capital, output and gross value of plant and machinery
- A moving average of three years block is the basis for CAGR calculation for fixed capital deployment in each of the sub-sector. Based on the current CAGR, fixed capital deployment is each of the sub-sector is calculated for the year 2024-25
- Further, for projecting investment in plant and machinery, seven years average ratio of gross value of plant and machinery to fixed capital is calculated. This average ratio is the factor for estimating gross value of plant and machinery for the year 2024-25.
- USD = INR 68
- INR= Indian National Rupee

Annexure 4: Food Processing Companies in India

Food Processing Industries[15]

The link below provides the list of various food processing companies in India.

http://www.dcmsme.gov.in/reports/agrobased.pdf

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MOFPI

Ministry of Food Processing Industries

Government of India

The Ministry of Food Processing Industries is concerned with formulation and implementation of the policies for the food processing industries within the overall national priorities and objectives.

The Ministry acts as a catalyst for bringing in greater investment into this sector, guiding and helping the industry and creating a conducive environment for healthy growth of the food processing industry. The Ministry aims at:

1. Creating the critical infrastructure to fill the gaps in the supply chain from farm to consumer;
2. Value addition of agricultural produce;
3. Minimizing wastage at all stages in the food processing chain by the development of infrastructure for storage, transportation and processing of agro produce;
4. Induction of modern technology in the food processing industries;
5. Encouraging R&D in food processing for product and process development;
6. Providing policy support, promotional initiative and facilities to promote value added produce for domestic consumption and also exports.

KPMG

KPMG in India, a professional services firm, is the Indian member firm affiliated with KPMG International and was established in September 1993. Our professionals leverage the global network of firms, providing detailed knowledge of local laws, regulations, markets and competition. KPMG has offices across India in Ahmedabad, Bengaluru, Chandigarh, Chennai, Gurugram, Hyderabad, Jaipur, Kochi, Kolkata, Mumbai, Noida, Pune and Vadodara.

KPMG in India offers services to national and international clients in India across sectors. We strive to provide rapid, performance-based, industry-focussed and technology-enabled services, which reflect a shared knowledge of global and local industries and our experience of the Indian business environment.

CII

Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society, through advisory and consultative processes.

As a developmental institution working towards India’s overall growth with a special focus on India@75 in 2022, the CII theme for 2017-18, India@75: Inclusive. Ahead. Responsible emphasizes Industry's role in partnering Government to accelerate India's growth and development.

Founded in 1895, India's premier business association has over 8500 members, from the private as well as public sectors, and an indirect membership of over 200,000 enterprises from around 250 national and regional sectoral industry bodies. With 67 offices in India and 11 overseas offices, CII serves as a reference point for Indian industry and the international business community.