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Food processing industry in India: A study on sunrise sector

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Abstract

India ranks as the world's second-largest producer of fruits and vegetables, trailing only China. However, a mere 2% of this vast produce undergoes processing. The processing levels remain low across various categories: approximately 2% for fruits and vegetables, 8% for marine products, 35% for milk, and 6% for poultry. One of the significant challenges facing this sector is the insufficient availability of suitable varieties that can be effectively processed. The food processing industry in India, which represents 32% of the country's food market, stands as one of its largest sectors and ranks fifth worldwide in terms of production, consumption, exports, and projected growth. It contributes significantly to both manufacturing and agricultural sectors, contributing 8.80% and 8.39% respectively to Gross Value Added (GVA). Moreover, it accounts for 13% of India's total exports and represents 6% of industrial investments. Currently valued at US\$ 1.3 billion, the Indian gourmet food market is expanding at a Compound Annual Growth Rate (CAGR) of 20%. The present study introspects into various aspects of the food processing industry in Indian context.

Keywords: Food processing industry, fruit and vegetable processing, marine products processing, milk processing, poultry processing

Introduction

India is the largest producer of milk, fruits, pulses, cashew nuts, coconuts and tea in world and accounts for 10% of the world fruit production. As per Nuffoods Spectrum report – 2016 about 35% of the fruits and vegetables are wasted annually due to poor storage facilities, amounting to a revenue loss of Rs 500 billion. Also, 80% of the vegetables rot due to high water content and lack of processing facilities, resulting in a revenue loss of Rs 125 billion. At global level India's share of processed food is very low at about 2% (Cygnus Business Consulting & Research, 2007, January) (Ghosh, N, 2014) ^[6]. In contrast, countries like the USA (65%), China (23%) and Philippines (78%) are far ahead of India in reducing wastage and enhancing the value addition and shelf life of farm products. This is an alarming signal for India as large volume of the agricultural produce is wasted.

Though India has a strong raw material base, it has been unable to tap the real potential for processing because of certain challenges that hinders the growth of this sector. These challenges need to be addressed to take this sector to the next level. Increasing the level of processing of perishable products will help to reduce the level of wastage, generating employment and fetching remunerative prices for farmers and helping in achieving Government's vision to double farmer's income by 2022 (Makda Sakina, 2019) ^[9].

Value addition to food has assumed critical importance in the last decade due to socio-economic and industrial factors. Preservation and processing of food products has a prolonged history in human civilization. Organized food cultivation is believed to have taken place 10,000 to 15,000 years ago (Makda Sakina, 2019) ^[9].

In present scenario, food processing is used as a major way to enhance human nutrition. It improves global food security by enhancing the nutritional composition of foods and its availability to expanding population of world. On industrial scale, environment friendly advance techniques with minimal loss of bioactivities are highly desirable for the food processing in foods industries. Human health will be benefitted by processed food products that meet food safety regulations.

The present need of time is to meet the challenge of food security and availability of food that is not only for feeding purpose but also rich in nutrition, because it is associated with well development of human resources in any country and it directly affects their contributions to the world

(Satyanarayana, S. D. V., Pindi, P. K., Singh, A., Dattatreya, A., & Aditya, G., 2012) ^[11]

As per ministry of food processing, Government of India, food processing industry consist of following segments:

Table 1: Segments of food processing industry

Segments	Products
Dairy	Whole milk powder, skimmed milk powder, condensed milk, ice cream, butter and ghee, cheese.
Fruits and Vegetables	Beverages, juices, concentrates, pulps, slices, frozen & dehydrated products, potato wafers/chips, etc
Grains and Cereals	Flour, bakeries, starch glucose, cornflakes, malted foods, vermicelli, beer and malt extracts, grain based alcohol
Fisheries	Frozen & canned products mainly in fresh form
Meat and Poultry	Frozen and packed - mainly in fresh form, Egg Powder
Consumer Foods	Snack food, namkeens, biscuits, ready to eat food, alcoholic

Dr. Bharat Kapoor. (July-Dec 2016). Impact of Nutrition on Human Health: A Study of Increasing Consumption of Processed Food in India. Amity Research Journal of Tourism, Aviation and Hospitality, 7-16.

Food processing increases seasonal availability of many foods, often improve the taste of food significantly, enables transportation of delicate perishable foods across long distances and makes many kinds of foods safe to eat by deactivating spoilage and pathogenic micro-organisms. Processed foods are usually less susceptible to early spoilage than fresh foods there by reducing the incidence of food borne disease. Processed food freed people from the large amount of time involved in preparing and cooking "natural" unprocessed foods. Modern food processing also improves the quality of life for people with allergies, diabetics, and other people who cannot consume some common raw food elements (Laudan. R, 2010) ^[8]

Make in India and food processing sector

The Government of India identified the food processing sector as one of the priority sector, under the "MAKE IN INDIA" initiative. The Ministry of Food Processing sector is implementing various schemes for the development of infrastructural facilities to attract investment in this sector. The Government of India has approved to build five numbers of mega food parks, which will be set up in Bihar, Maharashtra, Himachal Pradesh and Chhattisgarh. The government has planned to build 42 Mega Food Park in next two-three years with high infrastructural facilities such as road, electricity, water supply, sewage facility and common processing facilitates. The food industry, which was valued at US\$39.71bn is expected to grow at a Compound Annual Growth Rate (CAGR) of 11 percent to US\$65.4bn by 2018. According to the Department of Industrial Policies and Promotion (DIPP), the food processing sector has received around US\$7.47bn worth of FDI during April-December 2016. The Confederation of Indian Industry (CII) estimated that the food processing sectors have the potential of attracting as much as US\$33bn of investment over the next 10 years (Taramani Agarwal, Suvayan Neogi, September 2017) ^[12].

Industry Scenario

India's food processing sector is one of the largest in the world and its output is expected to reach \$535 Bn by 2025-26.

The Food Processing sector in India has a quintessential role in linking Indian farmers to consumers in the domestic and

international markets. The Ministry of Food Processing Industries (MoFPI) is making all efforts to encourage investments across the value chain. The food processing industry has a share of 12.22% (at 3-digit of NIC classification) in the employment generated in all Registered Factory sector engaging approximately 2.03 Mn people. Unregistered food processing sector supports employment to 5.1 Mn workers as per the NSSO 73rd Round report 2015-16 and constituted 14.18% of employment in the unregistered manufacturing sector. Major sectors constituting the food processing industry in India are processed fruits and vegetables, RTE/RTC, mozzarella cheese, processed marine products, edible oils, beverages, and dairy products.

Under PMKSY the projects sanctioned under various schemes as on date (30.09.2023) include, 41 Mega Food Parks, 371 Cold Chain projects, 68 Agro-Processing Clusters, 474 proposals under Creation/Expansion of Food Processing & Preservation Capacities (CEFPPC), 61 Creation of Backward and Forward Linkages Projects, 46 Operation Green projects, 186 Food Testing Laboratories projects have been approved across the country.

The key sub-segments of the Food Processing industry in India are Fruits & Vegetables, Poultry & Meat processing, Fisheries, Food retail, dairy industry, etc.

Key facts:

- Total horticulture production in the year 2022-23 is estimated to be 355.48 MT, an increase of about 8.30 MT (2.39%) as compared to the year 2021-22 (final)
- India ranks 1st in Milk production and the total milk production in the country during 2022-23 is 230.58 MT. In the year 2022-23, the milk production has registered an annual growth rate of 3.83%
- In 2022-23, the total egg production in the country is 138.38 Bn which have increased by 6.77% as compared to the previous year
- The fish production in 2022-23 is was recorded at 17.54 MT.
- Production of plantation crops is estimated to increase from 15.76 MT in 2021-22 to 16.84 MT in 2022-23, which is an increase of about 6.80%
- India achieved an all-time high exports of seafood both in terms of volume and value by shipping 1.73 Mn MT of seafood worth \$8.09 Bn during FY 2022-23
- The export of other cereals recorded a growth of 13.64% in nine months of the current fiscal
- India export of other Cereals (Excluding Rice, Wheat

Maize and Millet) to the world was worth \$3.39 Mn in FY 2022-23 as per APEDA

- The total meat production in the country is 9.77 MT for the year 2022-23 with an annual growth rate of 5.13%. The total five major meat producing States are Uttar Pradesh (12.20%), West Bengal (11.93%), Maharashtra (11.50%), Andhra Pradesh (11.20%), and Telangana (11.06%)
- The estimated production of rice is 135.75 MT, Wheat is 110.55 MT, and Nutri/Coarse cereals is 57.31 MT for the year 2022-23
- India's exports of food grains have registered a steady growth in last few years which is reflected in the increase in India's share in world foodgrain exports from 3.38% in 2010 to 7.79% in 2022 as per UN COMTRADE statistics. Top agricultural products exported from India include Marine products, rice, spices, amongst others.
- Non-Basmati Rice has emerged as India's top export item among the many agricultural and processed food product exports under APEDA basket, with the export of \$4,663 Mn in nine months of 2022-23 (Sandipan Sensarma)

Review of Literature

(Dr Madan Lal Singh) examines the status and identifies the problems slowing down its growth. The Indian food processing industry accounts for 32 percent of the country's total food market, one of the largest industries in India and is ranked fifth in terms of production, consumption, export and expected growth. Food Processing Sector in India has been growing faster than agriculture as well as manufacturing sectors and has the potential to create jobs mainly in rural areas, bridge the gap between the retail price paid by the consumer and that received by the farmer and create value addition and earn foreign exchange by export of value-added farm produce. India's economy is mainly based on agriculture sector but there is more wastage and still inadequate facilities of processing the food products. The share of Indian Food Processing Sector in Gross Value Addition (GVA) of manufacturing sector was 8.6% in 2014-15 whereas During FY11-16, India's exports of processed food and related products (inclusive of animal products) grew at a CAGR of 11.74 percent, reaching US\$ 16.2 billion (Dr Madan Lal Singh).

(Makda Sakina, 2019)^[9] attempts to study the current status and trends in food processing industry, examines the support initiative taken by government to promote the industry, identifies and discusses the challenges hindering the growth of the industry and suggests strategies to overcome the challenges. The study musters data from secondary sources from financial year 2010-11 to 2016-17 to look into the performance issues related to food processing sector. Food processing industry is of mammoth significance for India's development because it links two pillars of the economy, industry and agriculture.

This industry needs agricultural products for further value addition. Promoting food processing is a key to enhance farm incomes in India, as it raises the demand for agricultural produce. Government's initiative to make India Global Food Factory and Global Food Market brings immense opportunities for food processing sector. India is a leading producer of many agricultural commodities in the world; however, its share in the global food trade is meager

1.5 percent. Processing level of agro commodities is very low compared to other countries leading to high wastage of perishables. Though India has a strong raw material base, it has been unable to tap the real potential for processing because of certain challenges that hinders the growth of this sector. These challenges need to be addressed to take this sector to the next level. Increasing the level of processing of perishable products will help to reduce the level of wastage, generating employment and fetching remunerative prices for farmers and helping in achieving Government's vision to double farmer's income by 2022 (Makda Sakina, 2019)^[9].

(ABIN JOSEPH) contend that food processing is one of the key sectors of the Indian economy. It has vital linkages with agriculture and industry. The huge scope for value addition makes this sector crucial in manufacturing. The reforms of 1990 have brought significant changes in the production, processing, marketing and consumption of food products. The research assess the status and performance of the food processing industry in India in the era of globalisation and liberalisation. The research study is mainly based on secondary data collected from the Ministry of Food Processing Industries, ASI and CMIE. Findings indicate that India possesses a comparative advantage in the food processing sector with its diverse and excellent raw material base for food production and subsequent processing, skilled human resources, cost competitiveness and use of modern technology. Nevertheless, despite having promising and favourable requisites, the food processing industry has not reached its potential. The development of the industry also depends on the degree to which existing challenges and constraints are removed. With the rapidly growing urban and young population, the demand for food processing is expected to increase (ABIN JOSEPH).

(Jadhav, Rajendra, August 2019)^[7] contend that Food Processing Industry are important for making food affordable and preserving the food items for the common public. The Food items grown in the farm are to be processed by various methods and tools depending upon the type of food items. The success depends on various factors since if anything wrong or delay in decision the loss to the company is incurred. The top management should decide the policies such that the food processing is done in time and at right proportion in right way to get the best output. The authors have studied various factors which will ensure the success and minimize the loss. This can be attributed to the improving policy environment and increasing thrust on public-private partnership and improvement of rural infrastructure, to leverage India's strengths on the supply and demand frontiers for Food Processing companies. The world market arena suggests an untapped opportunity to capitalize on India's enormous raw material base and propel exports, they also indicate critical challenges to be trounced to sustain continual growth of the industry for the improvement of the industry (Jadhav, Rajendra, August 2019)^[7]

(Kakali Manjumdar, 2013)^[1] opines that Indian food processing industry is primarily export oriented. With the export growth rate of around 15%, its share in the international market is only 1.7%. Again, only 2% of the total food produced in India is processed for further consumption. This is a matter of concern that despite massive potential, this sector remains grossly underutilized. Against this background, the research study aims at the export prospect of Indian Food processing industry laying

focus on its trends, the problems it faces and possible remedial measures to achieve its high potential. Growth rates have been calculated following the best fitted trend. Revealed Symmetric Comparative Advantage Index has been used to measure the Comparative advantage of Indian processed food export (Kakali Manjumdar, 2013)^[1].

(Taramani Agarwal, Suvayan Neogi, September 2017)^[12] propagates that Indian Food Processing Industry (FPI) is one of the most untapped industries with abundant raw material to grow at higher rate. FPI has been identified as a priority list in "MAKE IN INDIA" programme by the Government of India to boost its domestic manufacturing and export share. In the last few years, FPI has emerged as a high-growth and high-profit sector due to its immense potential for value addition while processing of food products at various stages. The degree of processing of value addition to agricultural produce in India (20 percent) is very low as compared to other countries, such as China (40 percent), Brazil (70 percent) and Malaysia (80 percent). In India, the degree of processed food products range between 2 percent (fruits and vegetables) and 35 percent (milk) for various agriculture products. Hence there exist huge potential of growth of this sector in India. The export value of FPI was US\$29.12bn in 2016 and its share in world import was 2.18 percent. (Taramani Agarwal, Suvayan Neogi, September 2017)^[12]

Food processing as a promising sector

India has an advantageous position in food processing on multiple fronts. Globalisation, urbanisation and changing dynamics of social codes have created new opportunities for FPI. By having close association with agriculture and industry, food processing has a crucial role in the economy. Agriculture remains the primary source of livelihood for the majority of the population. However, people engaged in agriculture remain poor because of low returns from farm activities. This has resulted in people shunning away from agriculture. There is a diminishing appeal for agriculture as an occupation at the present times, especially among the youth. In such a situation, food processing has a vital role to play owing to its backward and forward linkage effects. It can improve the productivity of agriculture, making it more lucrative and attractive. The growth of the food processing industry is also expected to create more employment opportunities in agriculture and industry. The food processing sector in India is fast evolving.

The following are recognised as the key drivers of the growth of the food processing sector in India

- 1. Strong and robust domestic demand:** With changing lifestyles, growing disposable income, urbanisation and changing demographics, the demand for processed food is expected to rise stronger. The increasing number of nuclear families and more women entering the workforce has increased the demand for processed and convenient food products.
- 2. Supply-side advantages:** As a food producer, India has a huge agriculture sector, a growing livestock population and cost competitiveness. The wide range of topography, soil quality and climatic conditions also favour growing various food products. Thus, having been blessed with favourable agro-climatic conditions, food production is expected to increase. This provides an opportunity for the country to become the food

processing hub of the world.

- 3. Increasing investment:** The rise in investments coming into the food processing sector from private and public players is transforming the country's food processing and allied activities. The increasing FDI inflows and domestic investment can modernise the food processing sector's infrastructure and retail. Improved technology, product standardisation, better packaging, strong distribution network and branding are expected to strengthen the demand and supply of processed food products.
- 4. Proactive government policy and support:** The government must set up a level playing field for all participants. Various incentives and concessions have been provided from time to time to make food processing attractive. Providing sops to private players, rationalising tariffs and duties of products relating to food processing, and creating favourable regulatory frameworks have been done by the government to increase the pace of growth of the food processing industry.
- 5. Greater integration with the world economy:** With the opening up of global markets and growth of organised retail, the Indian food products and food market have become more attractive for global players. There is a rising demand for Indian products in the international markets. India can take advantage of this by increasing quality and safety standards. This is also an opportunity to improve the export potential and generate more earnings (ABIN JOSEPH).

Problems in Food Processing Industries

- 1. Supply Side Problems:** Small and dispersed marketable surplus due to fragmented holdings, low farm productivity, high seasonality, perishability and intermediation result in lack of distribution on supply and quality, and in turn, impede processing and exports.
- 2. Non Availability of Infrastructure:** More than 30 percent of the produce from farm gate is lost due to inadequate cold chain infrastructure. The food processing industry has a high concentration of unorganized segments, representing almost 75 percent across all product categories.
- 3. Problems in the Law and rules:** Lack of integration & clarity: Numerous laws, under the jurisdiction of different ministries and departments, govern food safety and packaging. The multiplicity of legislation leads to contradictions in specifications, conflicting approach, lack of co-ordination and administrative delays.
- 4. Awareness and Financial Problems in Farmers:** The Financial problem is major problem in the food processing industry and the awareness and education of the farmers also crates the problem in this industry to grow.
- 5. Human Resource Problem:** The skilled man power is the major problem in this sector.
- 6. Lack of International Exposure:** The lack of exposure in the International market creates a great problem to this industry which affects its working and profitability. (Jadhav, Rajendra, august 2019)^[7].

Market Size

India is one of the largest populated countries in the world and is expected to continue having one of youngest

populations in the world till 2030. The growing consumption of food is expected to reach US\$ 1.2 trillion by 2025-26, owing to urbanization and changing consumption patterns. The processed fruits and vegetables industry was valued at US\$ 15.4 billion in 2019. With heightened consumer awareness during lockdowns, there's increased demand for processed foods, especially in RTE/RTC, dairy, and fruit and vegetable segments.

The market size of food processing sector in India is estimated to reach US\$ 1,274 billion in 2027 from US\$ 866 billion in 2022, backed by the rise in population, changing lifestyle and food habits due to rising disposable income and urbanization.

Food and grocery market in India is the sixth largest in the world. Food processing industry contributes 32% to this food market and is also one of the largest industries in the country, contributing 13% to total export and 6% of industrial investment. The food processing industry, within the registered factory sector, employs about 1.93 million people while the unregistered sector also employs approximately 5.1 million workers (India Brand Equity Foundation, 2024).

Impetus for the Growth of Food Processing Sector

Growth of organized food retailing has made the Indian market more attractive for global players; with a large agricultural resource base, abundant livestock and cost competitiveness, India is fast emerging as a sourcing hub of processed foods.

- The rising youth population is likely to increase India's overall food consumption, with a population size of 1.22 billion of which 604 million were under the age of 24 in 2011.
- Rising income level of growing middle class and increased purchasing power.
- Availability and increasing demand of Indian nutraceuticals (health food).
- One-third of the population will be living in urban areas by 2020.
- Changing food habits towards branded, packaged and ready to eat foods because of increase in number of nuclear families and increase in number of working women.
- Large distinct consumer segments support customized offerings/new categories and brands within each segment. Positive economic & cultural transformation in attitudes & lifestyles, consumers are experimenting with different cuisines, tastes and new brands.
- There is an increase in awareness and concern for wellness and health, high protein, low fat, wholegrain, traditional foods and organic food.
- Government policy support under Make in India initiatives. (Makda Sakina, 2019)^[9]

Solutions to the problems and success factors for the success of food processing industries

1. **Solution to Supply Side Problems:** The supply side problems have to be handled in systematic and scientific way. The role of government both state and Central Government is very important in this area.
2. **Availability of Infrastructural Facilities:** The lot of investment in this area is required and the group or government has to motivate and help in creating

infrastructural facilities for food processing industries.

3. **Law and Enforcement of Law:** The Strict laws should be framed to create the discipline in this sector the various problems can be avoided if the law enforcement is done properly.
4. **Creating Loan and Financial Support to the Farmers:** The Producers are neglected by all in the country the proper support from government is very much required to this sector in the form of loans and subsidies
5. **Human resource development-to meet increasing demand for skilled manpower:** Stimulate industry, academia and government to put in combined efforts for development of specialized institutes and courses for providing training on managerial, safety and enforcements, technology and production, warehousing and distribution aspects. Encourage State Agricultural Universities to commence courses in food packaging, processing, bio-technology, information technology in agriculture and such allied fields.
6. **International Exposure:** To create the facilities for International Exposure and also provide the all facilities for the same (Jadhav, Rajendra, august 2019)^[7]

Challenges in the Indian food processing industry Wastages

According to a recent study across the country, the wastage of cereals ranges from approximately 3.89% to 5.92%, while wastage of fruits and vegetables varies from around 4.87% to 15.05%. Furthermore, there have been notable losses within the milk, meat, poultry, and marine fisheries sectors (1%-6%).

Infrastructure bottlenecks

India has a large agricultural sector, but is fragmented and underdeveloped. This leads to problems such as a lack of storage facilities, poor transportation infrastructure and high levels of wastage. Deficiencies in the supply chain infrastructure can lead to inadequate primary processing, storage, and distribution facilities. There is insufficient linkage between production and processing, primarily due to the absence of processable varieties.

Seasonality of operations and low capacity utilisation.

There are institutional shortcomings within the supply chain, exemplified by a reliance on Agricultural Produce Market Committee (APMC) markets.

Emphasis on quality and safety standards is insufficient

The food processing industry in India is highly informal, with more than 75% of the sector consisting of small-scale and unorganised units. This makes it difficult to implement and enforce food safety standards and regulations.

Lack of skilled labour

The industry requires a skilled workforce, which is short supply in India. This is due to several factors, including lack of vocational training programmes and low wages.

Regulatory environment

The regulatory environment for the industry in India is complex and fragmented. This can make it difficult for businesses to comply with the rules and regulations.

High cost of capital

The cost of capital is relatively high in India, making it difficult for businesses to invest in new technologies and infrastructure.

In addition to the above challenges, the food processing industry in India is also facing new challenges such as the need to adopt sustainable practices and meet the growing demand for healthy and nutritious food (Viksit Bharat by 2024) [13].

Way Forward

The food processing sector in India presents significant opportunities for growth, income generation, and employment, particularly within the Micro, Small, and Medium Enterprises (MSME) segment, where it holds the largest share. Notably, it is also characterized by substantial female participation, especially in household-based enterprises. While the sector has been steadily advancing with support from both public and private initiatives, further enhancements are necessary. These include improved infrastructure, expanded market access, better financial credit facilities, and a conducive policy environment.

India's Free Trade Agreements (FTAs) play a pivotal role, with duties on over 90% of processed food products being reduced. This move aims to protect Indian agricultural products, although agricultural commodities largely remain on the negative list. Nevertheless, there is a need for strategic regulation of trade liberalization policies to ensure the sustainable growth of the domestic food industry.

The shift from traditional agriculture to agribusiness marks a significant revolution in India's agricultural landscape. While agriculture's direct contribution to GDP is moderate, the agribusiness sector is poised for growth, driven by increasing demand for value-added products. However, ensuring food safety standards and adopting cutting-edge technologies are crucial for producing high-quality goods. Implementing rigorous safety and quality measures such as Total Quality Management (TQM), ISO certifications (ISO 9000, ISO 22000), Hazard Analysis and Critical Control Points (HACCP), Good Manufacturing Practices (GMP), and Good Hygienic Practices (GHP) is essential. These measures not only safeguard consumer health but also enhance product acceptance in global markets, thereby positioning the industry competitively on an international scale.

In summary, while the Indian food processing sector holds immense potential, strategic interventions and adherence to quality standards are imperative to capitalize on emerging opportunities and sustain long-term growth (Taramani Agarwal, Suvayan Neogi, September 2017) ^[12]

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