

Evolving Trends in Haryana's Food Processing Sector: Growth, Structure, and Linkages

Abstract:

The present piece of study tries to highlight the status and structure of the food manufacturing industry of the state Haryana. The status of the industry has been analyzed in terms of its structure, growth and contribution in the total manufacturing sector of Haryana. The study utilizes ASI data (2008-22) and NIC classification to evaluate sub-sector performance. The food manufacturing sector is dominated by the grain milling industry followed by manufacturing of other food products units including bakery products, confectionary, prepared foods and many more. Fruit and Vegetables processing units, prepared animal feed manufacturing units and meat processing units remains few, limiting their contribution in the sector. Moreover, the industry has shown a very inconsistent growth trend when compared to the manufacturing sector. Higher working capital intensity of the industry in comparison to raw material intensity indicates creation of more forward linkages by the sector in terms of technological advancements and have revealed comparatively lesser backward linkages.

Keywords: Food Processing Industry, Haryana, structure, growth trend, forward and backward linkages.

Introduction:

“Agro-processing could be defined as a set of techno-economic activities carried out for conservation and handling of agriculture produce and to make it useable as food, feed, fiber, fuel or industrial raw material. Hence, the scope of the agro-processing industries encompasses all operations from the stage of harvest till the material reaches the end users in the desired form, packaging, quantity, quality and price”(Kachru, 2010). It also includes processes of value addition through various methods like preservation, drying with a view to preserve food

substances, and addition of food additives to enhance the shelf life as well as quality. Packaging also enhances shelf life of food(Annual Report, 2018-19). It covers more than just preparing and cooking of the raw material. It includes a range of processes that are used to preserve the raw products for later use. These processes do not necessarily require expensive and complicated equipment. Some of the processing practices can be used at home and for small scale enterprises. It will help reducing post-harvest losses and can increase food security by available food for the off season. Processing helps in increasing the shelf-life of raw products by deactivating enzymes and destroying bacteria. Processing helps transforming raw material into completely new products (Ali & Dofour, 2008).A broad range of activities can be considered as processing. To avoid any kind of confusion, agriculture-based products can be categorized into three groups based on the level of processing (Bathla & Gautam, 2021).

Food processing industry plays an important role in the development of the Indian economy through the integration between agriculture and industrial sector. The food processing sector has been growing at a faster rate than the agriculture sector since last 5 years. This sector has emerged as an important segment of the economy in terms of employment, investment and contribution to GDP. The food products industry has the largest number of factories as well as largest number of employees(GOI, Haryana Agri-Business and Food Processing Policy, 2018). Food processing assumes key importance in a state like Haryana, where agricultural production has already reached on plateau(Kumar & Dixit, 2016).The study of the food processing industry in Haryana's economy is significant due to the industry's role in economic development, employment generation, and agricultural transformation. The industry's capacity for value addition, its status as a target for foreign direct investment (FDI), and its influence on supply chain management practices are all factors that underscore the importance of this sector in Haryana's economic landscape (Hyder & Bhargava, 2016).Analysis of the agro-based and food processing industry would help providing a push to the state's economy (Industrial Investment & Business Promotion Policy, 2015).Haryana is not a leader in fruit production but preservation has been in practice in form of "Achar" and "Chitin" since age. The growth in the fruit processing industry has been positive since 1980-81 and processing of horticulture products is taking momentum. The industry revived again during 2001-02 to 2010-11(Kumar & Dixit, 2016). But inadequate post-harvest infrastructure and processing centers lead to large amount of crop wastage, specifically perishables including fruits and vegetables. So, there lies a need for

expanding the current capacity of processing centers, cold-storages and warehouses (Tripathi, Agarwal, & Bhanushali, 2016). The present study attempts to highlight the prospects of food Processing Industry in Haryana, identifying the major challenges restricting the growth of the industry in the state.

Review of related literature:

(Patniak, 2002) in his study tried to analyze the income, output and employment generation from the food processing units in the Ganjam district of Orissa. The average net income generated out of individual units was Rs. 3047.91 per head and output at Rs. 7924.10 per head implying scope for increasing the scale by expanding the units. Moreover, very high dependence on the local market for raw material was found indicating further scope of extension of market along with parallel improvement in income, output and employment generation. While (Padhi, 2002) in his study of agro-processing units of Puri district of Orissa tries to study the performance of the industry in terms of generating income, output and employment. The growth in the employment was found to be low and did not show any significant improvement over the time-period under study. Raw material was found to be the most important component of cost with a share of 86.22 per cent while wages and salaries incurred 4.47 per cent of total cost. A study conducted by (Goyal, 2006) also analyzed the growth and potential of the fruit and vegetable processing industry in India. The production of fruits and vegetables units was found to be much less than the installed capacity of their processing. A large portion of the processing was found to be carried by the small-scale cottage industry. The production of processed fruit and vegetable products witnessed compound growth rate of 9.33 per annum with installed capacity at 1.15 per cent per annum. Another study conducted by (Kachru R. , 2010) tried to analyze the growth history of Agro-processing industries in India focusing on the role of R&D, its status as well as recent trends in the sector. India, despite holding a major share in some of the agro products globally was found to be not realizing its market potential fully due to post harvest management and inadequate infrastructure. In an article (Sharma, Pathania, & Lal, 2010) analyzed the structure and extent of value addition in the agro-processing unit in Himachal Pradesh. The findings indicate that industrial development in the state was quite low and the overall capacity utilization was found low to be 53 per cent and the major factor for this was inadequacy of supply of raw material. While the service sector units were sound even at low level of capacity utilization due

to low fixed and securing cost. Focusing on the industry on macro level, (Shelly & Kaur, 2015) attempted to highlight the development experience of India by analyzing the contribution of the sector in terms of its share in the Indian Economy. Findings of the study indicated that the percentage share of un-registered FPI in GDP has gone down between 2005-06 and 2011-12 whereas the percentage share of registered FPI has increased for the same period. Moreover, the per cent share of exports from the FPI sector increased between the time period between 2006-07 and 2012-13. Another article studying the industry at macro level was conducted by (Sarangi, n.d.) and the valuation of the Indian gourmet food market was estimated at US\$1.3 billion and the growth rate of online food delivery industry at 150 per cent year-on-year. The export volume of Indian food processing industry has improved to a CAGR of 11.74 per cent over the time period from 2011 to 2017.

Research Gap: From the reviewed pieces of literature included in the study and others also, it was observed that very less research has been done on the food processing industry and more specifically in the state Haryana. There were a smaller number of studies found on Haryana level, even the research base is very weak in terms of the structure and status of the industry. Before any intensive study on any area there has to be some base level of research to understand the area of research and the present study attempts to fill this gap through understanding the nature and characteristics of the industry in the study area.

Methodology:

Agro-Processing Industries can be classified into (1) Food-Processing agro based Industries and (2) Non-food processing agro-based industries (Saraswati, 2004). Present study focuses on the organized segment of the food-processing agro based industries and does not cover the non-food agro based industries. The present study relies on quantitative analysis techniques, utilising data from the annual survey of industries (ASI) for the time period 2008-09 to 2021-22. Focusing on food manufacturing sector of Haryana, the study attempts to analyse the structure of the industry in terms of growth in the number of units of the subsectors and share of food processing industry of Haryana in manufacturing sector in Haryana. The study considered following NIC codes under the food manufacturing Industry as per the NIC classification 2008-09:

Table-1

National Industrial Classification of Food Products

NIC Codes	Type of manufacturing unit
101	Processing and Preserving of Meat
103	Processing and Preserving of Fruit and Vegetables
104	Manufacturing of Vegetables, Animal oils and Fats
105	Manufacturing of Dairy products
106	Manufacturing of grain mill products, starches and starch products
107	Manufacturing of other food products
108	Manufacturing of Prepared Animal Feeds
110	Manufacturing of Beverages

The study utilises following data analysis techniques:

Annual Growth Rate:

To study the growth in the output of Food Processing Industry and of total manufacturing sector in Haryana, the Annual Growth Rate has been calculated for the following time period:

2008-09 – 2020-21

The formula used is:

$$\frac{C - P}{C} \times 100$$

Where,

C = Value of Current Year

P = Value of Present Year

Raw material Intensity:

$$\frac{\text{MaterialCost}}{\text{TotalCost}} \times 100$$

Working Capital Intensity:

$$\frac{\text{WorkingCapital}}{\text{NetValueAdded}} \times 100$$

Table-2**Number of Factories across FPI in Haryana (in operation)**

Year/NIC code	101	103	104	105	106	107	108	110
2008-09	-	4	20	21	348	40	25	39
2009-10	-	7	51	20	297	37	7	38
2010-11	-	18	56	28	426	36	16	62
2011-12	-	10	63	36	412	41	14	73
2012-13	-	9	59	29	390	45	12	64
2013-14	-	10	61	27	410	45	12	66
2014-15	5	13	69	39	601	65	11	78
2015-16	8	14	73	41	598	73	13	80
2016-17	12	15	76	43	595	81	15	81
2017-18	6	25	72	45	609	83	25	88
2018-19	8	30	73	57	635	139	18	85
2019-20	6	36	67	48	466	96	27	58
2020-21	6	43	39	49	507	106	18	80
2021-22	18	28	59	48	386	116	19	87

Source: ASI

Table 2 is showing the group-wise number of units (in operation) in the food processing industry in Haryana from the year 2008-09 to 2021-22. Data from the table clearly shows that the food processing industry in Haryana is dominated by the NIC code 106, i.e., grain mill processing

over the whole time period of 14 years. Other subsectors also have shown major improvements which includes Manufacturing of Vegetables, Animal oils and Fats, Manufacturing of other food (include bakery products, sugar, cocoa, noodles, chocolate and sugar confectionery, macaroni, prepared meals, couscous and similar farinaceous products) and by manufacturing of Beverages. The least number of factories are under the factory code 101, i.e., processing and preserving of meat followed by factory code 103, i.e., processing and preserving of fruit and vegetables and factory code 108 represents manufacturing of prepared animal feeds. Factory codes 10, i.e., Manufacturing of Dairy products also have comparatively a smaller number of factories. The state does not have any fish processing units in any of the year which is under the NIC code 102.

Table- 3
Annual Growth Rate across Food Processing Units (GroupWise) in Haryana (in %)

Year/NIC Code	101	103	104	105	106	107	108	110
2008-09	-	-	-	-	-	-	-	-
2009-10	-	75	155	-4.76	-14.65	-7.5	-72	-2.56
2010-11	-	157.1	9.8	40	43.43	-2.7	128.5	63.15
2011-12	-	-44.4	12.5	28.57	-3.28	13.8	-12.5	17.74
2012-13	-	-10.1	-6.34	-24.13	-5.3	9.75	0	-12.32
2013-14	-	11.11	3.38	-6.34	5.12	0	-8.33	3.12
2014-15	-	30.0	13.11	44.44	46.58	44.44	18.18	18.18
2015-16	100	7.6	5.7	5.12	-0.4	12.3	66.66	2.56
2016-17	50	7.14	4.1	4.87	-0.5	10.95	15.38	1.25
2017-18	-50	66.66	-5.26	4.65	2.35	2.46	66.66	8.64
2018-19	33.33	20	1.3	26.6	4.26	67.46	-28	-3.4
2019-20	-25	16.66	-8.9	-18.75	-36.26	-44.79	33.33	-46.55
2020-21	0	19.44	-41.79	2.08	8.79	10.41	-33.33	37.93
2021-22	200	-34.88	51.28	-2.04	-23.86	9.43	5.55	8.75
AAGR	44.04	27.53	15.81	1.75	2.02	9.6	13.89	7.18

Table- 3 is showing the annual growth rate of the sub sectors of food processing industry in Haryana. Highest average annual growth rate is shown by processing and preserving of meat and meat products. This trend is followed by processing and preserving of fruit and vegetables units with average annual growth rate of 27.53 percent. Units under manufacturing of Vegetables, Animal oils and Fats have shown a AAGR of 15.81 and units under manufacturing of prepared animal feeds have shown AAGR of 13.89 percent. Least growth is shown by the Dairy products units which can be seen from the NIC code 105.

Table-4

Annual growth rate of Output of FPI as against the Total manufacturing sector in Haryana (in %)

Year	AGR of FPI	AGR of Manufacturing sector
2008-09	14.67	15.57
2009-10	13.98	22.70
2010-11	63.36	21.54
2011-12	-2.56	15.24
2012-13	47.05	13.98
2013-14	-14.31	6.59
2014-15	29.39	23.98
2015-16	-11.35	18.08
2016-17	37.02	15.31
2017-18	-1.76	0.58
2018-19	60.17	23.95
2019-20	-29.50	-4.42
2020-21	9.09	-1.11
2021-22	1.65	25.68
AAGR	15.49	14.11

Table 4 is showing the annual growth rate of FPI in comparison to total manufacturing sector in Haryana over the years. Though there is not a very significant difference between the average

annual growth rates of the FPI and the manufacturing industry as a whole. But the annual growth rates of the FPI have been showing many fluctuations where the annual growth rates of the manufacturing sector were rather stable. The FPI even showed negative growth rate in some of the years including 2011-12 when it was only -2.56 and in 2013-14, it was -14.31 and in 2015-16, it was -11.35 and in 2017-18 it was at a level of -1.76 percent only and in the year 2019-20 it fell to -29.50 percent. The average rate of growth of food processing industry was 15.49 per cent, higher than of total manufacturing sector with only 14.11 per cent. Overall, the table reveals that total manufacturing industry has performed better in terms of annual growth rate of output.

Table-5

Share of the Food Processing Industry in Total Manufacturing Sector of Haryana

Year	Output	Working Capital	Invested Capital	Net Value Added
2008-09	10.87	50.09	15.69	9.70
2009-10	10.10	13.94	14.25	6.58
2010-11	13.57	20.99	19.48	11.03
2011-12	11.67	13.75	16.63	1.21
2012-13	15.06	26.43	19.16	12.61
2013-14	12.10	24.38	15.62	8.72
2014-15	12.63	2.40	15.11	1.08
2015-16	11.85	20.11	14.71	3.90
2016-17	11.27	18.77	14.40	6.47
2017-18	11.00	15.14	12.09	6.55
2018-19	14.22	19.23	13.66	8.06
2019-20	10.48	12.45	10.62	7.22
2020-21	11.56	9.19	10.83	8.96
2021-22	9.35	10.47	10.31	7.11
Average	10.93	18.38	14.46	7.08

Table-5 is showing the share of the food processing industry in total manufacturing sector of Haryana. The FPI had strong performance in the initial years of the study but in following years it seems to have challenges in terms of falling share in output and in capital investment. The food processing sector in Haryana has seen periods of strong performance but is now facing challenges in terms of stable growth, with decreasing output and capital investment in recent years. Specifically, the years (2017-18- 2021-22) have shown a downward trend, particularly in output and working capital indicating possibility which may be due to challenges in maintaining the investment and efficiency of the industry. Decline in the share of output and net value added in the same time period indicates toward downfall in the contribution of FPI in total manufacturing sector of Haryana. Despite inconsistent growth over all the characteristics, the FPI of Haryana still holds a notable share in the total manufacturing sector of Haryana. The fluctuations in the share if working capital and invested capital is indicating variability in investment and in operational efficiency.

Table-6

Raw material Intensity and Working Capital Intensity in FPI in Haryana (in %)

Year	Raw Material Intensity	Working Capital Intensity
2008-09	76.44	220.66
2009-10	73.78	98.30
2010-11	69.68	222.44
2011-12	81.53	1153.69
2012-13	83.62	115.15
2013-14	84.32	153.43
2014-15	76.64	112.81
2015-16	81.13	170.37
2016-17	81.54	136.48
2017-18	77.10	137.24
2018-19	84.23	170.61
2019-20	77.74	144.66
2020-21	80.52	94.29
2021-22	81.28	129.49

Average	79.25	218.54
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Table- 6 shows that the food Processing Industry in Haryana is working capital Intensive, also the average of working capital intensity is higher than the average of raw material intensity. The raw material intensity did not show much fluctuation over the years under study while the working capital intensity has fluctuated significantly. It has been at a very high level in comparison to raw material intensity. High capital intensity paves way for more technological advancement and new technology while raw material intensity makes more backward linkages by creating demand for raw materials including agricultural and other raw materials (Naqvi, 2019). This way we can see that the food processing industry in Haryana is creating forward as well as backward linkages and giving boost to both agriculture and industry.

Result and Discussion:

India ranks second in the global fruit production, first being China. Fruits need to be handled carefully and in the whole supply chain, its post-harvest intensity is higher. The supply chain of this segment is complex and involve use of a number preserving techniques to reduce spoilage and to increase the shelf life. Indian cold-chain facility is highly fragmented leading to high wastage and high marketing cost in the fruit processing industry. Moreover, there has been no massive investment since many decades. India has good supply chain in apples, grapes and bananas, but not for other fruits and vegetables. The cold storages are primarily being utilized for potatoes. Due to insufficient cold-chain facilities logistic infrastructure and post-harvest handling activities, the fruit processing industry is still in nascent stage (Sharma, Singh, & Anand, 2016). In Haryana, the percent share of fish production improved as share of total agricultural GSDP from 0.548 in 2004-05 to 1.391 in 2018-19. The fish farming rate, production of fish as well as fish seeds and fish production per hectare have grown over the last decade. So, the incentive is needed on the policy front. Moreover, CAGR of fisheries is higher than that of GSDP in agriculture and of GSDP of Haryana also (Garg & Gupta, 2019). This way, there seems no major problem on the production (raw material availability) front and the focus is needed on the policy front. Other reasons may include the dietary preference of the state or the presence of big MNCs. Considering all these issues there is need for more support from the government end to create

infrastructure for the fish industry in the organized sector. Haryana contributes 5.6 percent of the country's total milk production and ranks second in per capita per day milk availability. The population of the state is primarily rural and believes in old traditions. The people still favour unpacked and unprocessed milk from the milk vendors also known as "dudhiya". They believe that it is fresh, pure and comparatively more nutritious than the packed and processed (Sharma & Sharma, 2020). Moreover, the procurement cost in the state is higher in the total western zone (Singh, Chandel, Chauhan, Das, & KM, 2021). The presence of the unorganized segment is a hurdle before the organised segment of the dairy industry. The organized milk processing segment should enhance their interaction with small farmers and try to earn their trust. Also, the milk production is not even in all the districts of the state. The organised sector needs to conduct research on the ground level and try to give better price to farmers than the unorganised one (Sharma & Sharma, 2020). There are substantial opportunities for R&D processes in the state which has the ability to improve the R&D project planning. Also, it is very crucial to consider the needs of the small and marginal units. Combined efforts of the private and public sector should be brought together to provide sufficient facilities to the processors (Joshi, Gondkar, Godara, & Shehrawat, 2016). Also, the food industry runs on a very thin margin, specifically some of the subsectors, so it becomes necessary to standardise the raw material prices. Different and varying prices (seasonally) may kill the spirit of entrepreneurs.

Conclusion:

The present study aimed to study the status of the food industry in the manufacturing sector of Haryana. The industry is primarily dominated by grain and oil milling industry but with lowest growth over the years. At the same time, absence of fish processing units and a handful of meat and fruit vegetable processing units reveals imbalance within the sector. Despite the imbalance, beverage manufacturing, animal oil, fats and vegetable processing units have shown significant growth. In the initial years of study, prepared animal feed manufacturing units have shown strong performance while others have revealed fluctuations in terms of growth specially in the last three-year period. The last three years have also shown downward trend in terms of output, working capital and investment share of the industry in the manufacturing sector as a whole. There was major drought in the year 2009-10 and an overall decline in the area under foodgrains (Agriculture and Food, 2011). The FPI in the state mainly consists of grain mill units

and the impact of the low foodgrain production was reflected in the negative growth rate (2.56) in the food sector of the state. In the year 2013, the FPI in Haryana had negative growth when the total manufacturing sector also secured a lower growth rate. During this time period the agricultural prices were very high and annual price rise was at the level of 16 percent (Sasmal, 2015), which had a negative impact on the food industry also. Implementation of new tax regime in the year 2017 (GST) impacted the supply chain management by minimizing the cash flow, specifically impacting the working capital (GST Impact: Manufacturing Sector, 2010). As the food sector is highly working capital intensive, its impact can be seen in its growth trend. The growth rate of the food industry as well as of the manufacturing sector as a whole experienced a very low growth rate during this change in tax regime. Again, in the year 2019, the food industry of the state and the overall manufacturing sector witnessed negative growth rate. It was the time when the COVID-19 pandemic disturbed the whole cycle from field to the client. The pandemic did not directly impact the food production but the food producers were imposed to destroy their own produce due to restrictions (Barman, Das, & De, 2021). This period of negative growth is also reflected in its share in the total manufacturing sector in terms of share in output and net value added. Nonetheless, the FPI still holds a considerable share in manufacturing sector of Haryana, despite the volatility in growth, output and investment. If the raw material and capital intensity is also considered, the data clearly signals further scope for technological advancements.

Disclaimer (Artificial Intelligence)

The manuscript was edited by Ipshita and Dr. Kiran Bala, who hereby declare that generative AI technologies (of any kind) has not been utilised or referred at any point in the manuscript.

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