

Boosting agro-processing industry in India

B L Manjunath^{1*} and C K Narayana²

ICAR-Indian Institute of Horticultural Research, Hessaraghatta Lake Post, Bengaluru, Karnataka 560 089

India has the second-largest arable land resources in the world, with 20 agri-climatic regions. India is also the largest producer of spices, pulses, milk, tea, cashew, and jute, and the second largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton, and oilseeds. Paradoxically, though India is one of the largest food crops producer in the world, the level of processing is low. Lack of adequate process-able varieties is said to be one of the reasons for low level of processing. However, realizing the fact that no single cause can be attributed as the reason, the government has introduced several schemes and modernization initiatives to improve the agro-processing in the country. As part of the approach, efforts have been made to increase digital transactions, cutting red tape, increasing efficiency, ease of doing business, unification of multiple taxes and several others like Operation Green, PMFME, NMFP, etc.

Keywords: Agro-Processing Industry, Ready-to-eat products, Market, Transportation

DURING 2019-20 crop year, food grain production reached a record of 296.65 million tonnes. Production of horticultural crops in India reached a record 326.6 million metric tonnes (MMT) in 2020-21. India has the largest livestock population of 535.78 million, which translates to around 31% of the world population. Milk production in the country is expected to increase to 208 MT in FY21 from 198 MT in FY20, registering a growth of 10% year over year. The country has shown significant increase in the exports of food products. The total agricultural and allied products exports stood at US\$ 41.25 billion in 2020-2021. The principal commodities that showed significant increase in exports during the financial year 2020-21 are wheat and other cereals, non-Basmati rice, soymeal, raw cotton, sugar and spices.

India is one of the largest food crops producers in the world, the level of processing is low (less than 10%). Approximately 2% of fruits and vegetables, 8% marine, 35% milk, 6% poultry are processed.

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. To boost the rural economy, the food processing sector has been put on a high growth trajectory. India's food sector attracted \$4.18 Bn in foreign direct investment (FDI) between April 2014 and March 2020.

Boosting agro-processing can have multiplier effect on country's economy as well as on enhancing employment opportunities. Agriculture is still the largest employer of manpower in the country with more than 50% of the people depending on agriculture as a source of income directly or indirectly. Over 70% of its rural households still depend primarily on agriculture for their livelihood. Therefore, this sector provides a huge employment generation potential as well. The food processing sector has been acknowledged as a high priority industry by the government of India and is currently being promoted with various fiscal reliefs and incentives.

According to the Annual Survey of Industries (2016-17), food processing accounted for 15.95% of the total number of factories; employment to 11.36% of the workforce; 14.09% of the output and 16.78% of the operational factories.

India not only has the advantage of a huge domestic market but is also blessed with abundant raw material, hence, is a large sourcing hub for agricultural products. Significant factors that contribute to the growth in agro-processing can be attributed to increase in the size of the food processing market as a result of changing consumption patterns, changes in the gender composition of workforce, and growing consumption rates. Additionally, more than two-thirds of India's 1.3 Bn people are young with growing incomes which also creates a large market for food products.

Processed foods such as ready-to-eat products and snacks have become quite popular, particularly in urban areas. By 2030, Indian annual household consumption is set to

increase by three times, making India an opportune market for consumption of processed foods. The increasing penetration of organized food retail outlets is offering a wide range of options to consumers. These outlets provide consumers access to diverse products, usually with attractive discounts. The silver lining in the sky are the following factors that play a role in favour of growth of agro-processing in India:

- **Strong domestic demand:** Changing lifestyle and food habits due to increased disposable income
- **Supply side advantages:** High level of agricultural production - large livestock base, wide variety of crops, inland water bodies and a long coastline, that help increase marine production
- **Export opportunities:** Proximity to key export destinations, greater integration with the global economy
- **Proactive government:** Policy and support.

A SWOT analysis of this sector indicated that the major strength of the food processing sector in the country is round the year availability of raw materials. With a major work force and huge geographical area involved in agriculture and allied activities, there is no shortage of raw materials to the sector. Continuous

supply of raw materials can assure a continuous supply of the final products to both domestic and international market. Therefore, the agro-processing sector is more promising than other agricultural and industrial activities. Any development in this sector will directly have an impact on the level of income of the population.

Rapid transportation is the basic prerequisite for the food processing as the shelf-life of majority of the food products is very less specially fruits and vegetables, hence to ensure reduction in post-harvest losses, there is a need of wide network of manufacturing hubs all over the country. Government has also ensured this by providing better transport facilities connecting the fields to the plants. Any minor change in tastes and preferences of such a huge fraction of consumers proves to be a voluminous increase in demand.

Among the weaknesses, the major hurdle in the development of the sector is the high initial working capital requirement. The working capital requirements from initial level of processing till marketing of the processed food, are high. The available technology in the country is still not suitable for small and medium entrepreneur to enter this sector without the assistance from the

government. A major section of the processed food is owned by the unorganised sector populated with very low level of skills, lack of funds to upgrade or mechanize and lack of technical knowledge of food processing. Many of the food processing plants are old and use traditional technologies, resulting in low processing efficiency realization. This increases the per unit operational cost of processing. Unorganised sector still opts the traditional methods of food processing, and this lowers down their production capacity and causes a major hurdle in the growth and development of the sector. The PMFME scheme of government of India, announced in September 2020 coupled with ODOP concept is aimed at removing this inherent weakness.

In spite of a huge sum of budget expenditure made on research and development, still the government is unable to bridge the gap between the lab and the industry. The dissemination of information is sometimes slow that by the time it reaches the industry, the technology becomes outdated in context of global market. On the other hand, the available technology is so costly that the small and medium entrepreneurs cannot adopt it. Hence this gap between the lab and the

Portable ozone based fruits and vegetable washer-cum-purifier (Ozo-C)

During the COVID-19 pandemic as people bring home fruits, vegetable, mutton and fish, the fear of contracting corona virus from the same also looms large. To ensure food safety, when we buy such commodities from the vendors and bring home, a suitable gadget with standard protocol is urgently required to ensure complete safety of commodities at home.

ICAR-CIPHET, Ludhiana has developed a portable fruits and vegetable washer-cum-purifier named Ozo-C based on Ozone technology. The portable system is an excellent ozonator which removes pesticides, bacteria, viruses and harmful chemical from the surface of fruits and vegetable, sea food and meat, making them hygienic. The system works on principle of silent "corona discharge method". It uses electric discharge to produce ozone by splitting the normal oxygen molecules in the air into single atoms. These atoms recombine with air (i.e. O_2) to form ozone (O_3). The unit cost of the device is approximately ₹ 3,500. This compact device may find a place in every kitchen, hotels, small scale fruit vegetable processors and vendors where it can play a vital role in reducing the risk of infection especially during this pandemic period. The technology has been transferred to two firms, M/s Siri Labs, Ongole and M/s CRD Invotech, Maharashtra.



processing unit is one of the major factors that are resisting the growth of the sector beyond 2%.

In spite of having comparative advantage in terms of raw material, agro production, and growing demand for processed food, the level of food processing is not significant as compared to other countries. More importantly the lack of processing and storage of fruits and vegetables results in huge wastages estimated at about 20-35%, the value of which is approximately INR 330 billion annually. The nation still faces the problem of improper methods of storage of food stuffs leading to great wastage of food products. Despite these weaknesses, agro-processing sector is a sunrise area due to several opportunities in posterity.

As average Indian spends almost half of his expenditure on food and food products, which is expected to increase by 20% of the current level. An increase in per capita disposable income by 8% by the end of present decade is also an opportunity which needs to be properly tapped. Along with demographic and economic changes, there are key lifestyle changes expected which will result in transition in consumers' consumption pattern:

- Growing number of nuclear working families who have limited

time for cooking.

- An increased incidence of lifestyle diseases such as diabetes, asthma and obesity resulting in a demand of healthy products.
- A growing level of international exposure which has led to consumer awareness of newer concepts.
- An increased consumer awareness driven by media penetration which is not restricted to urban India.

The major threats or challenges faced by food processing industries are:

- Supply chain infrastructural gaps (lack of primary processing, storage and distribution facilities or network).
- Lack of product development and innovation.
- Inadequate focus on quality and safety standards.
- Seasonality of operations and low-capacity utilization.
- Inadequate link between production and processing.
- Being a WTO signatory, Indian market is open for both imports and exports. Rise in the level of equity for MNCs through FDI allows the entrance of MNCs in the domestic market, due to which domestic producers face a much higher competition in the

domestic market in terms of price as well as the quality and standard. The promotion strategy adopted by the MNCs is highly intensive that it shadows the domestic products.

The major agricultural legislative reforms introduced by the government of India recently are to address these challenges being faced by the Indian farmers and agro-processing sector. A well-developed agro-food processing industry is expected to increase farm gate prices, reduce wastages, ensure value addition, promote crop diversification, generate employment opportunities as well as export earnings. The challenges for the food processing sector are diverse and demanding, and need to be addressed on several fronts to derive maximum market benefits. A multi-pronged strategic plan addressing lacunae mentioned above can put India among those nations driving the innovation-led entrepreneurship in the arena of production, processing, marketing and distribution of food and agricultural commodities and helping in growth of the economy and livelihood of the people.

¹Director, ²Principal Scientist. *Corresponding author's e-mail: manjunath.bl@icar.gov.in

Portable smart ultraviolet-C disinfection system (UViC)

A portable surface disinfection system for disinfecting personal items and office stationery has been developed to help fight against COVID-19 pandemic. Unlike chemical sanitizers, UV-C does not leave a residue and does not require extensive safety equipment. It works as a mode of surface sterilization by destroying nucleic acid and disrupting the DNA of microorganisms. The developed system exceeds UV-C exposure of 1.22 J/cm² (total dose) which is well above the amount of exposure needed to inactivate SARS-CoV-2. The working capacity of the unit in terms of the total surface area of the objects to be treated/exposed is 25 × 25 cm². The estimated cost of the unit is approximately ₹ 1,500. However, the system can be scaled up as per the need. The system has been tested for inactivation of *Escherichia coli* as classic examples of gram-negative bacteria. The influence of the treatment parameter, i.e. the exposure duration has been investigated on *E. coli*. Findings indicated that no visible *E. coli* colonies were observed after six minutes of continuous UV-C exposure. The developed system is unique, portable and cost-effective which can be installed in offices, homes, shops, hospitals, malls, etc. The technology has been transferred to two firms, M/s CRD Invotech, Maharashtra and M/s Sakhi Soaps, Hindustan Soaps and Salts Company, Andhra Pradesh.

