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"ANALYSING THE TRENDS AND CHALLENGES IN THE PRODUCTION AND PROCESSING OF FOOD"

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Abstract

Conserving foods includes several processing processes in order to keep food quality at the required level in order to obtain maximum benefits and nutritional qualities. Methods of food conservation include food production, caught, processed, packaged and distributed. This opinion article addressed historical, contemporary and future food processing problems. If only fresh methods can conquer new difficulties, new food processing possibilities are created. Themes such as safety, preserving, nutrition, sensory, well-being, environment and potential for future problems were addressed.

INTRODUCTION

For survival, food has been consumed by both animals and humans. It is mostly produced from different plants and animals, but is treated before human use. The process of producing raw materials is thus transformed into foodstuffs. These transformed food items may be utilised directly for home cooking or in the food industry. The food production process may be separated into many phases and each is extremely essential. The process begins with the main stages of cleaning, segregation, etc. in the food processing sector and concludes when food is packaged and sold. [1]

The Indian food ecosystem provides enormous investment possibilities, encouraging food retail development, favourable economic policies and appealing fiscal stimulus. India is the sixth biggest food & grocery market in the world. Furthermore, India's retail food & grocery industry accounts for almost 65% of India's overall distribution market. The Government of India is taking all necessary measures via the Ministry of Food Processing Industries (MoFPI) to promote

investment in the food processing sector in India. [2] Food processing involves processing, through processing, (involving staff, power, machinery or money) every raw product from agriculture, dairy, animal husbandry, meat, poultry or fishing in such a way that their primal physical properties change, and the product is commercially valued and suited for both animal and human consumption. It also covers the process of adding value to the production of goods using techniques like as preserving, adding food additives, drying, etc. to effectively preserve foods and improve shelf life and quality. [3] A number of innovative food processing technologies were examined and developed to alter or replace conventional food processing methods, thus enabling the production of higher quality and more consumer-friendly food. Over the last decade, the emphasis has been on quality, which improves food product efficiency, safety, productivity and stability in a healthy manner. Factors such as raw material quality, transport, processing methods, packaging, storage and the food chain affect the nutritional content of food (farm to fork). [4]

By 2024 there will be an estimated \$4.1 trillion on the food processing industry with a CAGR of 4.3 per cent between 2019 and 2024. The biggest drivers in this industry are growing demand for ready-to-eat meals, changing lifestyles and a rise in nuclear families and workers. Emerging developments that have a direct effect on industry dynamics include the development of technology for food processing that minimise adverse food shifts and preserve nutritional content. The main producers of food products are Cargill Foods, Nestle, PepsiCo, Archer Daniels Midland and Unilever. [5]

LITERATURE REVIEW

Tolulope J. Ashaolu and Joseph O. Ashaolu (2020) In the absence of any kind of pollution or hazardous circumstances, green food is cultivated and collected. Intelligent foods are called beneficial for consumers, farmers and the world. Organic food is considered to "credence products" since there is no apparent or easy verification of certain characteristics that customers may evaluate. These three concepts are thus linked, since they create a shared fundamental denominator – health. The ideas of green, intelligent and organic foods and their interconnectedness, connection with health and sustainability are discussed here. They are discussed. The GSO food processes, regulations and worldwide trends were addressed without jeopardising their advantages and difficulties. [6]

Giovanna Visioli Caterina Agrimonti, Marta Lauro (2020) Organic agriculture, biofertilizer and, to a lesser degree, nanoparticles enhance fruit antioxidant characteristics. However, findings on proteins and micronutrients are very inconsistent. On the other hand, sophisticated instruments and precision farming make it possible for crops to be more lucrative, efficient, increasingly contributing to the reduction of pest illnesses and the improvement in quality and food safety. Thus, today's use of sustainable agricultural technology represents a difficult and dynamic problem in the face of adverse trends owing to effects on the environment and climate change. [7]

Serpil Aday, Mehmet Seckin Aday (2020) A pandemic is not a novel occurrence in human history because humankind has suffered numerous historical pandemics. The unifying theme is the severe negative impact of pandemics on the global

economy. Given the food supply chain as one of the most significant economic sectors, COVID-19 has been shown to have an effect from sector to consumer on the whole process. Given the current difficulties in the food supply chain, food production, processing, distribution and demand are now a matter of major concern. COVID-19 has led in limited mobility of labour, changed consumer demand, closure of food manufacturing facilities, restricted food trade regulations, and food supply chain financial constraints. Governments should therefore let employees and agri-food products to travel around. [8]

Gaurav Rajauria, Calm, Brijesh, Tiwari, Anushree Priyadarshini, (2019) This study identifies new food processing technologies for thermal and non-thermal foods in terms of their mechanisms, applications and business considerations. There is an overview of the degree of acceptance of new technology in food processing by the food industry and of the variables affecting their industry adoption. The technical capabilities, the size and market share of individual businesses as well as the ability to absorb a new technology are at the level of the industry. The technology has its own characteristics, such as expenses related to its development and marketing, the accompanying risks and proportional benefits, as well as the degree of complexity and compatibility. The study indicates that it is essential for the commercial adoption of a thorough knowledge of technology development and use as well as its acceptability elements 9

Cristóbal N. Aguilar, Hector A. Ruitz. Anilú Rubio Rios. Mónica Chávez-González. Rodríguez-Jazo. Araceli Loredo-Treviño. Mónica Chávez-González. Adriana C. Flores-Gallegos. Mayela Govea-Salas and Juan A. Ascacio Valdes. (2019) Especially, it is important to assess the influence of sustainable green biotechnologies in order to consolidate the future food industry and analyse mega-consumptions trends that shape the future of industry, from local to on-the-go food, to an increase in organic food and clean labels (understanding ingredients on food labels). While they may seem foreign to food production, they affect the manner in which goods are produced considerably. This article examines in detail the circumstances of the food business and in particular evaluates the use of new technology in the preservation of food, bioactive component extraction, bioengineering instruments and other biological development methods. [10]

Food Production and Processing – The Indian Scenario

In terms of pulses, bananas, dairy, ginger, buffalo meat, wheat, potato, garlic, cassava, groundnut, dry onion, grassy peas, pumpkins, gour, cauliflowers, candy and tea worldwide, the study Reports of Insight (2014) state India is the world's biggest producer. India manufactures 17% of the world veggie total and 14% for fruit. Around 40% of mangoes worldwide and 30% of bananas and papayas worldwide are produced in India. In addition, India offers numerous unique items like Alphonso mango and Madhya Pradesh wheat is rich in unusual protein. The scope of agricultural product processing in India remains infant. In non-perishable goods such as cereal and pulses, the processing level is more than 90%, with the majority of the processed, sorted and moistened products being mainly processed. But just 7% of the total Indian products perishable are processed which is much less than the worldwide average.

Table 2 shows that the processing levels for various commodities range from one in seven percent to three in three in three of India's total fruit and vegetable

manufacture. Fruits and vegetables are very low in processing. In unorganised sectors, the processing level of goods such as milk (22%), marine fisheries (9%), and shrimp is considerably greater (1 percent).

Table 1: Level of Perishable Food Processing in India

Item	Organised sector %	Unorganised sector %	Total
Fruits & vegetables	1.2	0.5	1.7
Dairy	15.0	22.0	37.0
Meat	21.0	-	21.0
Poultry	6.0	-	6.0
Marine fish	1.7	9.0	10.7
Shrimps	0.4	1.0	1.4

A combination of demand supply variables may accredit the present low processing level. The access to a number of fresh products and the inclination towards newly prepared foods has led to a compact demand for fruits and vegetables processed. On the demand side. The fragmented supply chain leads to considerable waste and waste on the supply side, which decreases the availability of raw materials of quality for processing.

The Challenges for the Agriculture and Food Systems (Production)

The key challenges which will be faced by the food and agricultural systems over the near future (Box 2) can be grouped into three clusters:

- (1) challenges related to food stability and availability,
- (2) challenges related to food access and utilization, and
- (3) systemic challenges.

(1) Challenges for food stability and availability

- Sustainably improve agricultural productivity to meet increasing demand.
- Ensure a sustainable natural resource base.
- Address climate change and intensification of natural hazards.
- Prevent transboundary and emerging agriculture and food system threats

(2) Challenges for food access and utilization

- Eradicate extreme poverty and reduce inequality.
- End hunger and all forms of malnutrition
- Improve income-earning opportunities in rural areas and address the root causes of migration
- Build resilience to protracted crises, disasters and conflicts.

(3) Systemic challenges

- Make food systems more efficient, inclusive and resilient.
- Address the needs for coherent and effective national and international governance.

The extent of processing in India can be categorized as follows

Primary Processing: cleaning, grading, powdering and refining of agricultural produce, e.g., grinding wheat into flour

Secondary Processing: basic value addition, e.g., tomato-puree, ground coffee, processing of meat products

Tertiary Processing: high value addition products like jams, sauces, biscuits and other bakery products ready for consumption.

In India, food processing is an extensive industry which includes farming, horticulture, plantation, livestock and fishing. It also covers other industries which utilise farm inputs to produce foodstuffs. The Indian Ministry of Food Processing has divided the sector into six segments: milk, fruit and vegetable; grain production; fish processing; and consumer foodstuffs, comprising embedded food, drinks, and drinking water packing. Table 2 presents several categories of the food processing industry of India as well as examples of goods manufactured in these sectors.

Table 2 Segments of Food Processing Industry and Products Produced in India.

Sectors	Products
Dairy	Whole milk powder, skimmed milk powder, condensed milk, ice cream, butter and ghee, cheese
Fruits & Vegetables	Beverages, juices, concentrates, pulps, slices, frozen & dehydrated products, potato wafers/chips, etc
Grains & 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 & Poultry	Frozen and packed –mainly in fresh from egg powder
Consumer Foods	Snack food, namkeens, biscuits, ready to eat food, alcoholic and non-alcoholic Beverages

The Indian food processing sector is vast, but in terms of growth it is still at an emerging stage. Only 2 percent of overall crops and foodstuffs are processed in the nation. The scale of the industry was assessed by the Ministry of Food Processing of India at US\$ 70 billion. Nine per cent of India's GDP was provided by the food processing sector and 6 per cent was involved in overall industrial output. 1.6 million people are directly employed by the sector. The processing business in India is extremely fragmented and disorganised. There are a lot of minor companies in this sector. About 42% of the production is produced by the unorganised sector and 25% by the organised sector, with the other minor participants. The unorganised sector still exists in this segment but is different in different categories, but roughly 75% of the market. In the secondary processing segment, the organised sector is substantially larger than the main processing sector. The main sector of processing is likewise quite fragmented. Primary food processing is one of the most important industries with a highly fragmented structure, including hundreds of thousands of rice mills and hulls, flour mills, oil seed mills, several thousand traditional bakeries; food processing units and fruit processing units for the unorganised industry.

CHALLENGES IN INDIAN FOOD PROCESSING SECTOR

There are varied and demanding problems for food conservation, distribution and

processing, which have to be solved to enhance agricultural and food processing development. A pan-India study throughout the full value chain was carried out with FICCI 2010), KPMG and India. This research examined the issues facing food processing. The main difficulties and methods for overcoming the issues are then given.

- 1 Infrastructure bottlenecks
- 2 Absence of comprehensive national level policy on food processing sector
- 3 Problem in implementation of Food safety Laws
- 4 Lack of adequate trained human resource
- 5 Supply chain hindrances
- 6 Access to credit
- 7 Lack of Research & Development
- 8 Low adherence to quality standards
9. Packaging cost
- 10 Taxation issues
- 11 Raw material constraints

CONCLUSION

One of the biggest constraints is the capital-intensive industry. It presents a high barrier to entry and only allows a limited number of players to join the market. Players indicate competition which reduces efforts to improve quality standards. The Indian food processing industry faces major challenges: educating consumers to be nutritious in processed foods; addressing low-cost elasticity in processed foodstuffs; need for a distribution network; developing marketing networks; simplifying food law; improving food quality standards and strengthening the food testing network; A number of issues have to be resolved in order to achieve the full potential of the Indian food processing industry. A fragmented and lengthy supply chain, inadequate infrastructure, lack of human resources capabilities, poor compliance with quality standards and the demanding capital nature of the business are among the major challenges facing this industry. In tackling these issues, our industry is on a par with the worldwide equivalent. The Indian government should provide support for policies and promote the growth of this industry to provide the double income of farmers.

REFERENCE

1. Smith JS, Pillai S. Irradiation and food safety. Food Technology. 2004;58(11):48–55.
2. Heldman DR, Moraru CI. Food encyclopedia of agricultural, food, and biological engineering, 2nd ed. CRC Press; 2010, pp. 869–72.
3. Moskowitz HR, Beckley JH, Resurreccion AVA. Sensory and Consumer Research in Food Product Design and Development. Ames, Iowa, USA: John Wiley & Sons; 2012. DOI: 10.1002/9781119945970
4. Amit, S.K., Uddin, M.M., Rahman, R. *et al.* A review on mechanisms and commercial aspects of food preservation and processing. *Agric & Food Secur* **6**, 51 (2017). <https://doi.org/10.1186/s40066-017-0130-8>

5. Arthur R. Unprecedented growth for asia beverage market in what will global beverage consumption look like in 2021? Region by region data. France: William Reed Business Media; 2016.
6. Tolulope J. Ashaolu, Joseph O. Ashaolu Int J Gastron Food Sci. 2020 Dec; 22: 100273. Published online 2020 Oct 20. doi: 10.1016/j.ijgfs.2020.100273 PMID: PMC7574864
7. Agrimonti C., Lauro M., Visioli G. Smart agriculture for food quality: facing climate change in the 21st century. *Crit. Rev. Food Sci. Nutr.* 2020:1–11.
8. Serpil Aday, Mehmet Seckin Aday, Impact of COVID-19 on the food supply chain, *Food Quality and Safety*, Volume 4, Issue 4, December 2020, Pages 167–180, <https://doi.org/10.1093/fqsafe/fyaa024>
9. Priyadarshini A, Rajauria G, O'Donnell CP, Tiwari BK. Emerging food processing technologies and factors impacting their industrial adoption. *Critical Reviews in Food Science and Nutrition.* 2019;59(19):3082-3101. DOI: 10.1080/10408398.2018.1483890
10. Cristóbal N. Aguilar, Hector A. Ruiz, Anilú Rubio Rios, Mónica Chávez-González, Leonardo Sepúlveda, Rosa M. Rodríguez-Jasso, Araceli Loredó-Treviño, Adriana C. Flores-Gallegos, Mayela Govea-Salas & Juan A. Ascacio-Valdes (2019) Emerging strategies for the development of food industries, *Bioengineered*, 10:1, 522-537, DOI: 10.1080/21655979.2019.1682109
11. Leisner CP. Review: Climate change impacts on food security- focus on perennial cropping systems and nutritional value. *Plant Sci.* 2020 Apr;293:110412. doi: 10.1016/j.plantsci.2020.110412. Epub 2020 Jan 15. PMID: 32081261.
12. Nielsen HB, Sonne AM, Grunert KG, Banati D, Pollák-Tóth A, Lakner Z, Olsen NV, Žontar TP, Peterman M. Consumer perception of the use of high-pressure processing and pulsed electric field technologies in food production. *Appetite.* 2009;52(1):115–26.
13. Tonelli, Flavio. 2013. “Industrial Sustainability : Challenges , Perspectives , Actions Flavio Tonelli * Paolo Taticchi.” *International Journal of Business Inovation and Research* 7(2):143–63
14. Thoben, Klaus-Dieter, Stefan Wiesner, and Thorsten Wuest. 2017. “‘ Industrie 4.0’ and Smart Manufacturing – A Review of Research Issues and Application Examples.” *Internantional Journal of Automation Technology* 11(1):4–19.
15. Anitha S., Htut T.T., Tsusaka T.W., Jalagam A., Kane-Potaka J. Potential for smart food products in rural Myanmar: use of millets and pigeonpea to fill the nutrition gap. *J. Sci. Food Agric.* 2020;100(1):394–400.