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Emerging Trends And New Technological Practices In Food Industry: A Review

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Abstract:

The food sector has been significantly impacted by the technology revolution. Utilizing technology is one of the biggest benefits now available to companies in the food industry. The market for food processing is expected to reach a value of 535 billion USD by 2025. The views and practices of individuals have changed since the post-pandemic period. People today strive to live a healthy lifestyle and are more conscious of their food choices. Leading food companies are always enhancing and changing their production processes to meet consumer demands. Every stage of the food manufacturing process, from selecting the raw materials to delivering them, is made easier for businesses by technology. Digitization aims to offer clients healthful meals as part of the change. Every stage of the food manufacturing process—from the source to the packaging, from the manufacture to the transportation—sees performance improvements. Numerous technologies are improving the nutritional value of food.

Keywords: Industrial trends, food technology, emerging trends, shelf life.

Introduction:

Modern methods for producing meals and food ingredients based on super-critical fluid technology, membrane technology, and certain biotechnology applications are rising in today's world. These methods are mostly used to produce probiotics, prebiotics, and functional foods that are enhanced and are "all-natural." A comprehensive analysis of non-thermal preservation methods for food preservation, including high hydrostatic pressure, pulsed electric fields, ultrasound, pulsed light, hurdle systems, etc., is discussed in this article. The present work aims to present an updated overview of the most recent food processes, covering food manufacture, preservation, and control (containing works published up through February 2001).The application of several new analytical techniques (including biosensors, food image analysis, and

molecular methods like Polymerase Chain Reaction (PCR)) for process and food control is reviewed in the last section of article.

Freeze-drying is a common method used in the food business to stabilize high-quality food. This method preserves the quality of the dried food. Food that has been preserved in this way maintains its flavor, aroma, and nutrient content. The prolonged shelf life of the food is a major convenience aspect. The food must first be frozen before being placed in a vacuum. The vaporization of the frozen liquid is accelerated by heat. The process of converting them back into solid form involves condenser plates. This procedure is completed in a device known as a freeze dryer, which comprises of a sizable freezing chamber and a vacuum pump to remove moisture. [1]

2) Vacuum-Fried-

Due of the low pressure used, vacuum frying has a lower frying temperature than atmospheric frying. When compared to atmospheric frying, the oil adsorption process in vacuum frying is different. Low frying pressure during frying reduces the amount of oil in the finished product. It keeps the natural colour, contains little moisture, retains 90% of the trans carotene, and aids in preventing the creation of 90% of the acrylamide-carcinogenic compounds.[1,2] In comparison to regular/atmospheric fried chips, vacuum fried chips have between 50 and 80 percent less fat while retaining up to 95 percent of the nutrients. Businesses use vacuum frying or freeze-drying techniques to preserve the product's greatest nutritional value, authentic flavour, and original shape.

3) 3D printing of food for consumption-

Personalized diets, alternative protein-based meals, and accurate and reproducible nutrition are all made possible by 3D food printers. Although material extrusion is the most typical food printing technique, companies are already adopting laser, inkjet, and bio-printing techniques to create food products. These methods emphasise improving the accuracy and quality of food products produced through 3D printing.[3] More study is being done on 3D food printing for large-scale food production as a result of the necessity for food brands to have items that meet exact specifications and can be produced with consistent quality. These approaches lessen the difficulty and expense of food production. Additionally, food manufacturers may now provide customised food products at scale without incurring additional tooling and operational expenditures thanks to 3D printing.[4]

(3) Robotics-

are used throughout the food and beverage value chain to increase production efficiency, consistency, and scale. To enhance guest comfort and safety, food companies also use hospitality robots in hotels and restaurants.[5]Food robotics is a major development in food technology, and

robotic chefs and food processors are helping to drive it. Additionally, autonomous drones and trucks are proving to be cost-effective replacements for manual delivery services. Fast and economical food labelling and monitoring is made possible in warehouses and grocery stores by drones and other food handling robots. With increased speed and precise food quality control, the robots boom in the food business is actually accelerating revenue from food manufacturing.[6]

The children's market in India accounted for a substantial portion of the market's US$ 1.5 billion 2019 valuation. Indian food regulators recently issued a regulation on high-sugar, high-fat, and high-salt products, which requires that packaged foods containing these ingredients display red colour coding on the front of the packet. This is due to the growing concern that children are consuming excessive amounts of sugar due to the high consumption of chocolate.[7] This year, the leader in the chocolate market, Cadbury, introduced a dairy milk variety in India with 30% less sugar as a response to the issue. Through the use of a technology, Cadbury was able to make sugar crystals "hollow," lowering the total sugar amount. Structured sugar technology produces hollow sugar crystals, which dissolve swiftly in the tongue and excite the taste buds more quickly. Even with less sugar, the chocolate's natural sweetness and flavor are retained.[8]

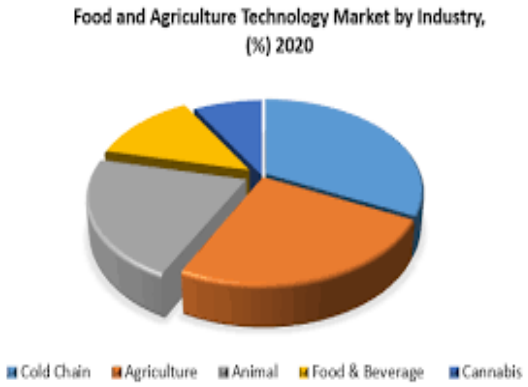

Fig. Components of Food and Agriculture technology

Getting nutritious food is now more important to people than eating fatty and greasy things. Technologies like cold press, HPP, vacuum frying, IQF, 3D printing, and sugar reduction technology, among others, appear potential for the Indian food business given the rising customer desire in clean label and natural products. These technologies are becoming widely used and widely embraced in order to produce enriched nutrition goods. To create healthier products using these technologies, it is also necessary to investigate additional food categories. The hospitality sector has historically been dominated by the food business [9]. Customers are looking for healthier meal options. worldwide increases in obesity rates and customer demand for healthier food options made possible by various techniques and technologies. It can be difficult to keep up with new technologies, especially ones that have not yet seen widespread adoption.[9,10]

We're looking at four technologies—freezing, disinfection, drying, and authentication—that could enhance some of the most fundamental processes used in food processing. frozen in isochrones conventional freezing has two drawbacks: it is pricey and frequently results in product changes. A possible workaround for both is isochoric freezing.[11]

Discussion- Simply defined, the procedure is placing food within a rigid container, either naked or sealed in flexible material, filling the container with water, and then freezing it. All but around 10% of the water inside the container is prevented from freezing by the pressure inside. Since the meal itself doesn't freeze, crystallization's cellular harm is avoided [12].According to a study, preserving food in an isochoric system as opposed to freezing leads in significant energy savings because only a small portion of the volume is frozen,[13] and freezing is a significant energy user. All of this was accomplished by putting the food in a closed isochoric system as opposed to being exposed to the open air, without really altering the refrigeration system. [14,15] According to Rubinsky and others, every type of food that is now frozen is a potential for isochoric freezing. Additionally, this allows for the preservation of foods that cannot be frozen because freezing causes ice crystals to form in the food, but in isochoric preservation, either no ice crystals form at all.[15]

Conclusion- This paper seeks to give an overview of open innovation (OI) and the food business, look at the major factors driving this model there, and evaluate the effects of corporate adoption of open innovation techniques. One of the biggest food producers in Jordan was the subject of one case study technique with expert interviews. Despite the fact that the food business is regarded as low-tech and rather mature, there are numerous trends and untapped possibilities that could allow the use of OI. One of the earliest studies in the MENA region, this one examines OI in the food business for the first time in Jordan. It is significant for the implementation of open innovation in nations with a scarcity of resources and a small market size, especially for SMEs that are unaware of the significance of open innovation methods and their applications. The results also suggested that Jordanian culture plays a significant influence in preventing the use of open innovation and those small and constrained markets may be a big impediment.

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