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## Emergence and Development of New Food Processing Techniques in the Last Decade

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### Commentary

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### COMMENTARY

Life forms on this earth require nutrients and energy to survive and to proliferate. This energy and nutrients they get from food. It may be of plant or animal origin. As food is also of organic origin <sup>[1]</sup> it gets spoiled after a certain time period depending on its type. As human has come long way in the scientific development and invented new technologies, he also developed new ways to preserve food <sup>[2]</sup> from spoilage so that it can be consumed after a certain time period when its availability would be nil or because of some other reasons. Food items mostly get spoiled because of growth of some microorganisms i.e. bacterial or fungi <sup>[3]</sup>. Preservation of food may include several methods depending upon its nature. But these preservatives are mostly of chemical nature and can intimate certain pathways in immune system and may lead to different types of allergies and other complications <sup>[4]</sup>. Recent advances in milk treatment for its long term preservation included Nitrogen gas flushing in to the milk which could kill certain spoilage bacterial groups <sup>[5]</sup>. However, its side effects are unknown as this study is going on at pilot scale yet. Refrigeration and reheating can also alter some physical and chemical properties of preserved food. In a research by Nikoo M, et al. they represented this phenomena subjected to a fish species called kutum <sup>[6]</sup>. Lipid oxidation and fatty acid composition were observed in research. After refrigeration followed by microwave heating it was observed that that polyunsaturated fatty acids <sup>[7]</sup> were less and saturated fatty acids were increased. Frying also increased the TBA value. So, preservation subjected to refrigeration and then subsequent heating for its consumption certainly decreased the nutritive value of the fish. Wheat which is most likely a staple food in India after rice is consumed mostly in the form of chapatti which is a flat round baked product <sup>[8]</sup>. There are also some other forms of wheat made products which lasts long good for consumption for 24-36 hours only under some protective conditions. There are several attempts made to preserve this food with antimycotic agents <sup>[9]</sup>. Preservation was successful but it developed a strange bitter taste in it. After that a bio preservative Nisin was used for the same in combination with sorbic acid which is an antimycotic agent <sup>[10]</sup>. Through this chapattis were liked by the civilians in a trial but still there is a need of preservative free wheat products in Asian countries. In fruit processing industry there are methods of treating fruits for its further different uses. But these methods like thermal concentration to make use of concentrated fruit juices are not very efficient, because these methods cause the fruit juice to lose of flavors and aromatic compounds <sup>[11]</sup>. Flavor and aroma of these compounds is due to some volatile compounds i.e. esters, aldehydes and ethers. During thermal processing these compounds get lost and the juice loses its aroma

and flavor. Additional chemicals are then added to counterbalance the effect [12]. So, research has to be done to develop new fruit processing techniques to save the natural flavor and aroma. Food drying is also an effective method of preservation and further processing [13]. In comprise to latest methods of food drying Microwave heating is used nowadays which is very effective method of drying as compare to the conventional method (hot air) of drying. Microwave drying is efficient and also saves nutrients and other delicate compounds which cannot withstand the conventional drying. Processed food may be a potent risk factor for cancer development. As research on animal and human epidemiologic shoed that diet plays and important role in cancer development [14]. In cooked foods there are heterocyclic aromatic amines which are the potent mutagens and have a considerable part in etiology of human cancer. The mutagenicity of heterocyclic aromatic amines is very high in processed meat. Cooking of meat also decrease intramuscular phospholipids on boiling and roasting [15]. Poly saturated fatty acid also decreases, more in roasting than boiling. Recently, a new type of food processing technique is coming into light i.e. High pressure technology. In this technology, liquid and solid foods are subjected to high pressures to kill the spoiling bacteria and other contaminating microbes. This was demonstrated with the keeping quality of raw milk by Kimura K et al. To increase the efficiency this method can be used in combination with heat treatment. High pressure technology is also used to make fresh jams which tastes like fresh fruit, salads, sauces, desserts and mandarin juices. This technology is gaining popularity because of its not only because of its preservation methods but also for also for interesting functional effects [16]. Application of computational techniques in various aspects of genomics and proteomics include disease analysis, understanding protein properties [17-20], particular drug target analysis [21-22] and so on. In recent years computational fluid dynamic techniques were used to design several food processing equipment. Computational fluid dynamic has so many applications in food processing like: cleaning of storage tanks, drying, sterilization, crystallization, baking and fermentation [23]. Soy milk is prescribed to individuals with lactose intolerance. But from feedback it was found that most people denied soy milk because of its beany taste. For the same, studies and trials are going on to make an orange-soy RTS beverage to remove the beany and unpleasant flavor. Studies suggested that 50% of the mixture of orange and soy milk showed best results for the removal of unpleasant taste of soy beans [24]. Some food processing techniques definitely decrease the nutritive status of food. So, health promoting power of foods depends upon their food processing techniques. Traditional methods like antimicrobials use and thermal processing may increase the nutritive value along with some methods maintaining bioactivity of food. These methods may not be very efficient in maintaining food safety [25]. For these facts and new advancements and innovations are necessary to maintain high quality of foods and further to enhance the quality of food. This may only be achieved by combination of new and ancient techniques of food processing. Along with the food quality, food safety is also a big concern [26]. To thrive in global food quality and to achieve high standards of food security developed and developing countries has to work together to see the limitations and difficulties in the way and to overcome and achieve new heights of possibilities.

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