Department of Food Technology

HEALTHY FOODS

Society of Food Technocrats 2021

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BHAI GURDAS INSTITUTE OF ENGINEERING AND TECHNOLOGY, SANGRUR-PUNJAB

Message

Dr. Guninderjit Singh Jawandha
Chairman
Bhai Gurdas Group Of Institutions

I am delighted to have the opportunity to release "Society of Food Technocrats', the annual college magazine. In this era of cut throat competition, apart study. One needs to have the holistic development of personality & this is our prerogative to chisel your thinking & persona here. The magazine will act as a platform for your creativity & writing aptitude & I intently believe that you would have an all-round development of your personality during your sojourn in this temple of learning. I congratulate the Director, staff & students for publishing "Technomantra'. I hope this issue would be meaningful, enjoyable & memorable in achieving its objectives.

Message

Prof. (Dr) Tanuja Srivastava

Director

Bhai Gurdas Institute of Engineering and Technology

It is a matter of great pleasure for me to learn that Editorial Board is bringing out an issue of the College magazine "Society of Food Technocrats',. I would like to appreciate those who have contributed articles for the college magazine as this shows the hard work, and the hidden potential of the students. I hereby congratulate those who contributed for the college magazine and welcome those who want to avail the
Opportunity next time.

(Prof) Dr. Tanuja Srivastava

Director

Message

Dr. Syed Insha Rafiq
Head of Department Food Technology

I am happy that department of Food technology is publishing yet another issue of “"Society of Food Technocrats', 2019” This magazine is by the student & for the Students. It aims at providing a platform to the students to explore their latent Capabilities & talent, to express their creativity and to develop their technical skills as you scan throughthe pages of the magazine, it will enlighten you with the important milestone the department has achieved this year. Beside, our budding talent have expressed their thoughts, ideas, hopes, feelings, aspirations & Convictions in a creative way.

I congratulate the editorial board for unleashing the hidden potential of the students & appreciate them for their effort in bringing out their issue.

Wishing the magazine a lasting success.

Dr. syed Insha
Head of Department Food Technology

Message

Er. Swati Priyadarshi
Assistant Professor Food Technology

It gives us great pleasure to bring you another issue of "Society of Food Technocrats', the collegemagazine of Bhai Gurdas Institute of Engineering & Technology. The name and fame of an institute depends on the caliber and achievements of the students and teachers. The role of a teacher is to be a facilitator in nurturing the skills and talentsof students. This magazine is a platform to exhibit the literary skills and innovative ideas teachers and students. Society of Food Technocrats presents the achievements of students and contributions of teachers. We would like to place on record our gratitude and heartfelt thanks to all those who have contributed to make this effort a success. We profusely thank the management for giving support and encouragement and a free hand in this endeavour. Last but not the least we are thankful to all the authors who have sent their articles. We truly hope that the pages that follow will make an interesting read.

Er. Swati Priyadarshi
Assistant Professor Food Technology

Students Editor's

1. Diksha Sharma (FT 8th)
2. Vishavjeet Bhardwaj (FT 8th)

Vision of the Department:

To achieve excellence in quality education, competent technologist, innovation and entrepreneurship that will benefit globally food processing sector and society.

Mission of the Department:

M1: To impart basic knowledge in the area of food science, food processing and safety.

M2: To inculcate in-depth knowledge of Food Engineering and Technology with an ability to analyze, evaluate, design, create and integrate existing and new knowledge.

M3: To equip and enable students with conceptual, technical and managerial skills to transform the organization and society.

M4: To serve people, society and nation with utmost professionalism, values and ethics to make development sustainable and quality of life.

PEO's of the Department:

PEO1: To provide students with the basic knowledge, skills and use of latest technologies in foodscience that help in lifelong learning and self education.

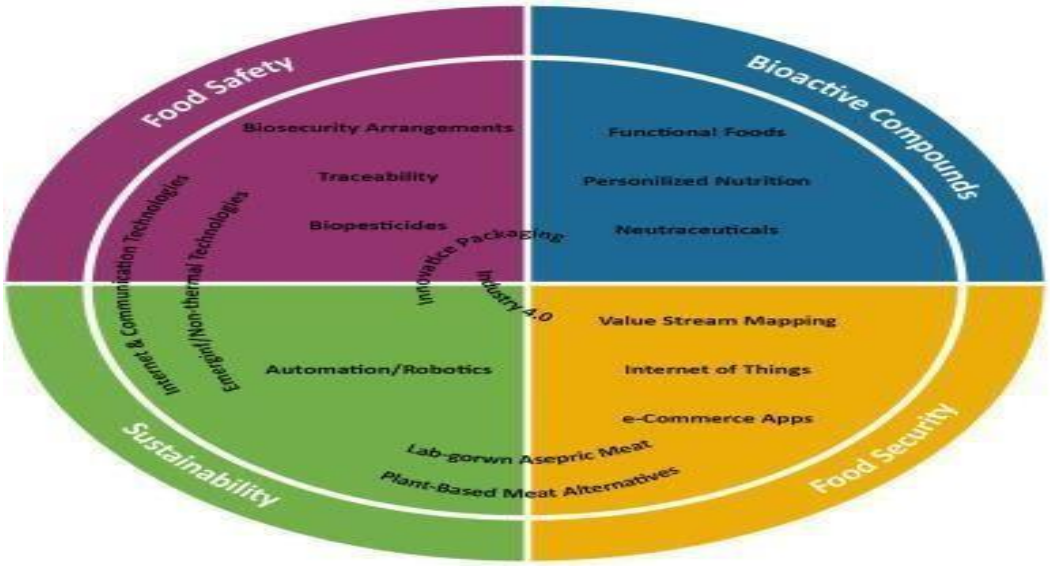
PEO2: To acquire theoretical, practical knowledge and Industrial exposure of Food ProcessingSector to become a qualified Food Technologist.

PEO3: To provide students with overall competency by inculcate skills, technical writing andcommunication skills as professionals.

CONTENTS

1. Innovations and technology disruptions in the food sector within the COVID-19pandemic and post-lockdown era.

COVID-19 pandemic has caused a global lockdown that has abruptly shut down core businesses and caused a worldwide recession. The forecast for a smooth transition for the agri-food and drink industry is, at best, alarming. Given that COVID-19 shutdown multiple core services (such as aviation, food services, supply chains, and export and import markets), there is an enormous deficiency in critical information to inform priority decision making for companies where this uncertainly is likely to

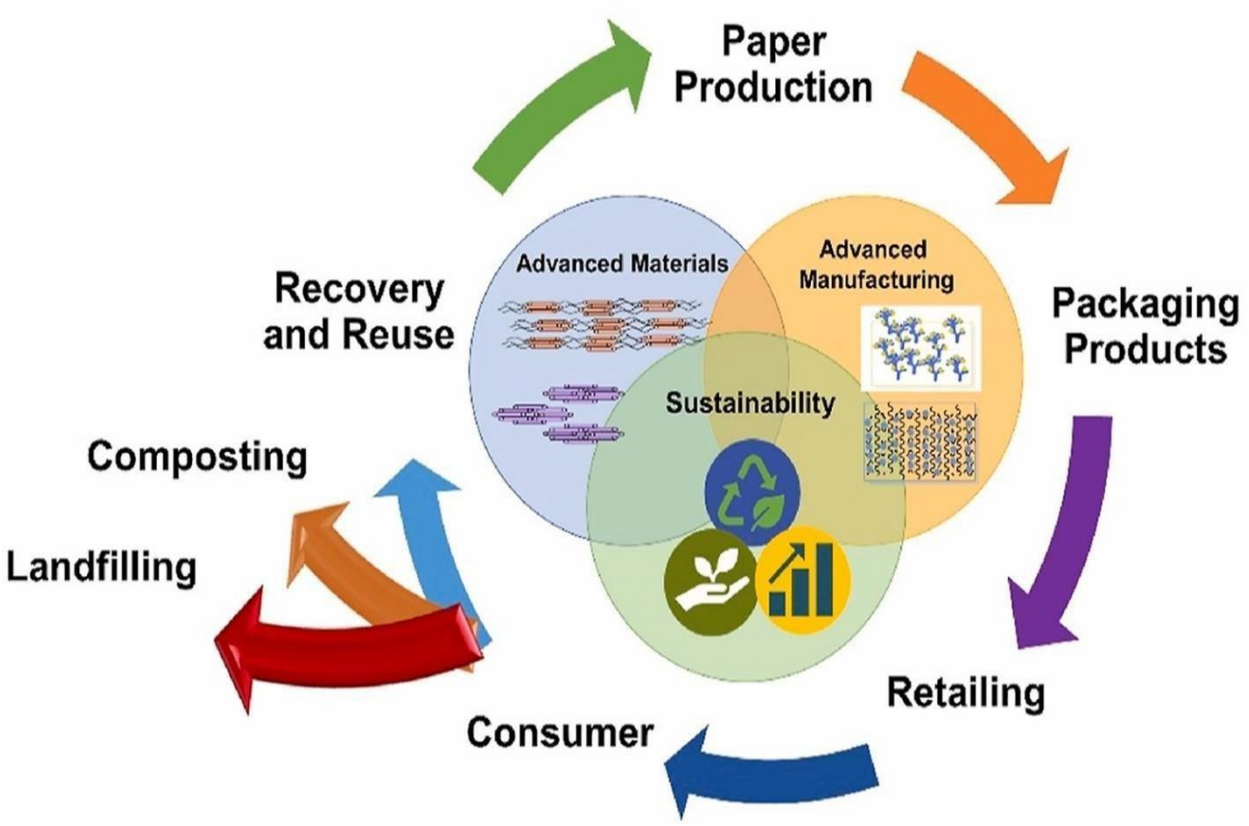


Internet and Communication Technologies, blockchain in the food supply chain and other Industry 4.0 applications, as well as approaches that redefine the way we consume food (e.g., lab-grown meat, plant-based alternatives of meat, and valorization of a vast range of bioresources), are the innovationswith the highest potential in the new era. There is also an equally pressing need to exploit social marketing to understand attitudes, perceptions, and barriers that influence the behavior change of consumers and the agri-food industry. Subsequently, this change will contribute to adapting to new norms forged by the COVID-19 pandemic, where there is a significant gap in knowledge for decision making.

Skeena (FT 8th)

2. Advances in barrier coatings and film technologies for achieving sustainable packaging offood products.

The technology of food packaging is responding to significant market dynamics such as the rapid growth in e-commerce and preservation of fresh food, a sector that accounts for over 40% of plastic waste. Further, mandates for sustainability and recent changes in national governmental policies and regulations that include banning single-use plastic products as observed in sweeping reforms in Europe, Asia, and several US States are forcing industries and consumers to find alternative solutions.

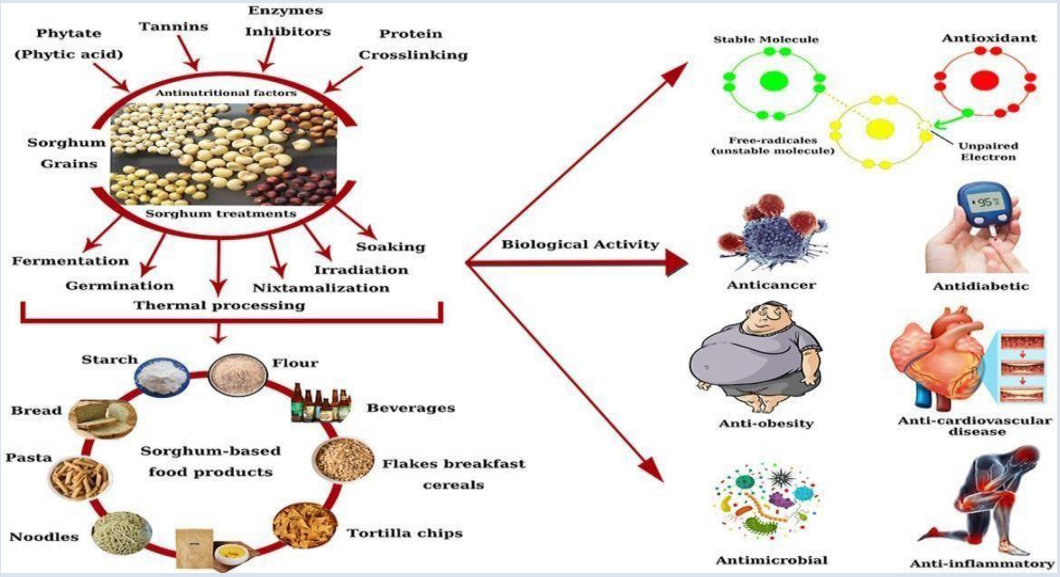


Different types of coatings, such as water-based biopolymers, due to their greater environmental compatibility, are making inroads into more traditional petroleum-based wax and plastic laminate paperboard products for fresh food bakery, frozen food, and take-out containers applications. In addition, nano-biocomposites have been studied at an accelerating pace for developing active and smart packaging.

Kaulveer Kaur (FT 8th)

3. Potential processing technologies for developing sorghum-based food products:

Sorghum belongs to the *Poaceae* family and is a popular grain worldwide especially in Africa. Sorghum grains (SGs) have a long history of usage as a traditional food in African countries. SGs and their products have high nutritional value and showed antioxidant, anti-obesity, anti-diabetic, anti-cardiovascular, anti-inflammatory, antimicrobial, and anticancer activity. However, SGs have some limitations due to the presence of some antinutritional factors such as tannins, phytates, trypsin inhibitors, and protein crosslinker.

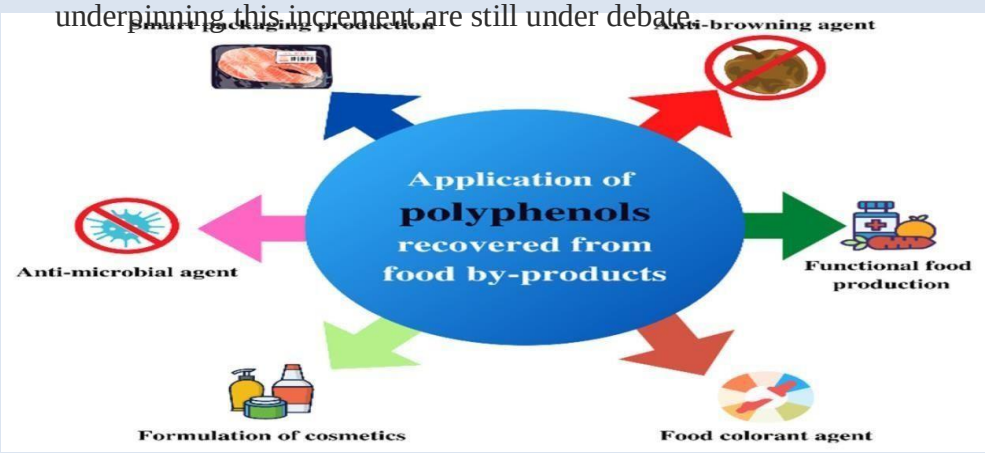


Technological processing such as soaking, germination, fermentation, thermal processes, irradiation, and others are suitable ways for removing or reducing anti-nutritional factors, improving sorghum quality, and producing foods with high nutritional value. Furthermore, fermentation is considered the best treatment followed by the combination of other treatments such as soaking, germination, and nixtamalization. Therefore, sorghum could be used in many food types such as bakery products, extruded products, beverages, and porridge. Sorghum-*ogi*, SGs beverages, and SGs ingredients (as food additives) are the best of them. Sorghum-*ogi* is considered as one of the probiotic foods, which is produced from wet-milled fermented sorghum.

Amrit Dass (FT 8th)

4. Enhancing carotenoid and phenolic contents in plant food matrices by applying non-thermal technologies: Bioproduction *vs* improved extractability.

The consumption of fruit and vegetables has been associated with prevention of degenerative diseases, which has been attributed to their abundant content in bioactive compounds such as carotenoids and phenolic compounds. Recent research has shown the potential of non-thermal processing technologies such as pulsed electric fields (PEF), ultrasounds (US), high-pressure processing (HPP), pulsed light (PL) and cold plasma (CP) to trigger the accumulation of these compounds through the induction of a plant stress response. However, the main mechanisms underpinning this increment are still under debate.



The application of PEF, US, HPP and CP to plant tissues causes structural changes in addition to triggering the production of reactive oxygen species (ROS). Therefore, bioactive compounds enhancement could result from a combination between their biosynthesis and their better extractability through membrane breakdown. Otherwise, PL generally does not induce permeability changes, whichindicate that higher bioactive contents are probably related to biosynthesis induction.

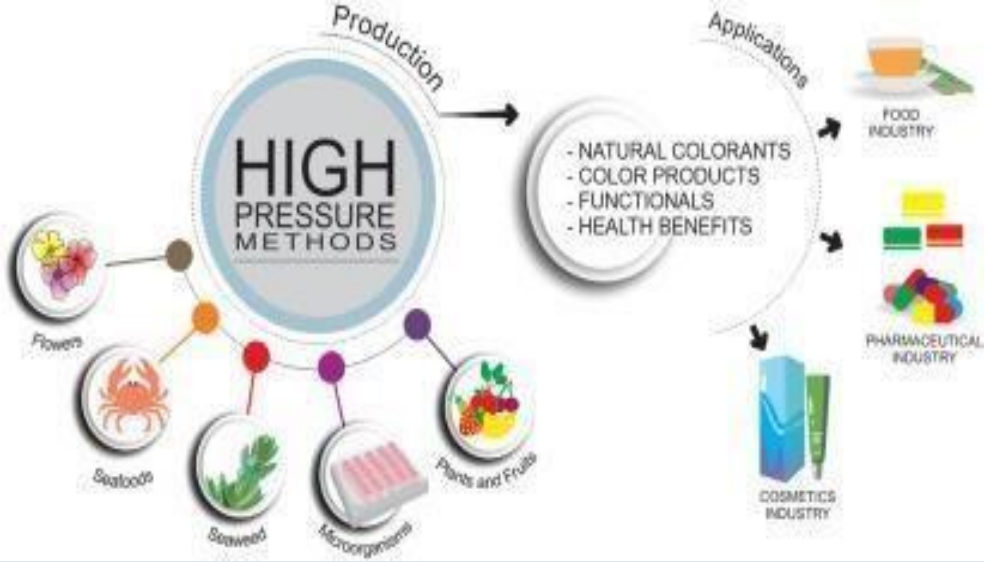
Simranjeet Kaur(FT 6th)

5. Food science and technology contributes to sustainable food systems

Food science and technology substantially contributes to food systems striving for more sustainable outcomes. This is shown at the annual EFFoST conferences and in food science oriented journals, even though perceptions may be different; the latter requires a more active involvement in current societal debates. Food science is in particular well- suited to contribute to more sustainable solutions because it deals with all elements of complex systems as well as with the environmental, social and economic dimensions of sustainability. This is due to its scientific and practical approaches, hence enabling to provide ingredients for policy making and innovation.

Bhavika Rai (FT 8th)

6. High-pressure fluid technologies: Recent approaches to the production ofnatural pigments for food and pharmaceutical applications.

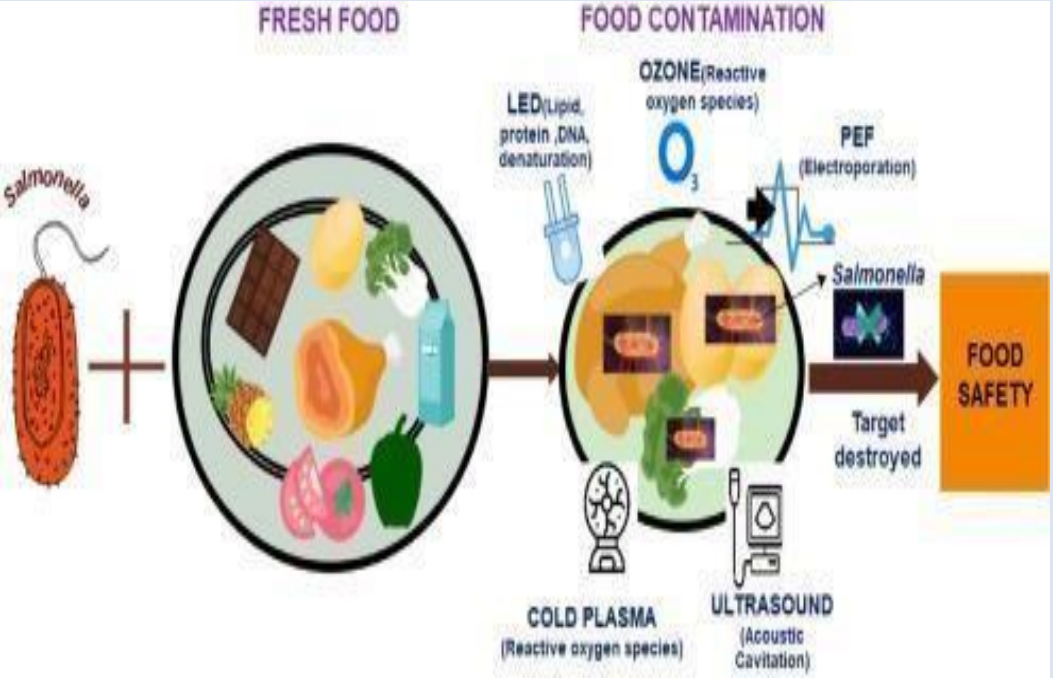


Color is the first and most impacting attribute affecting directly the consumers preference, selection, and desire. Synthetic colorant ingredients are largely used by the food and pharmaceutical industries. However, there are concerns about the use ofsynthetic pigments due to their adverse health effects. These issues have increased the progressive replacement of synthetic pigments by natural ones. To fulfill this demand, high-pressure fluid technologies (HPFTs) have been considered as green emergent methods with large potential of application, from extraction until product formulation. The recovery of natural pigments from food industry by-products using high-pressure fluid processes is a viable and suitable alternative. SC-CO_2 formulation processes can provide protection and improve the solubility and bioavailability of natural pigments. Overall, HPFTs allow the recovery and formulation of natural pigments with high potential for application in food, supplement development, and various pharmaceutical applications.

Harpreet Kaur (FT 8th)

6.Emerging non-thermal technologies for decontamination of *Salmonella* in food.

Salmonella infection has become a foremost health issue as it is the causative agent of several foodborne outbreaks. Currently, there is a huge demand for safe, healthy, and nutritious, fresh-like food products. It strongly suggests the food manufacturers to develop appropriate practices like expeditious testing, detection, and inactivation of foodborne pathogens as well as to prevent the pathogen entry into the supply chain.



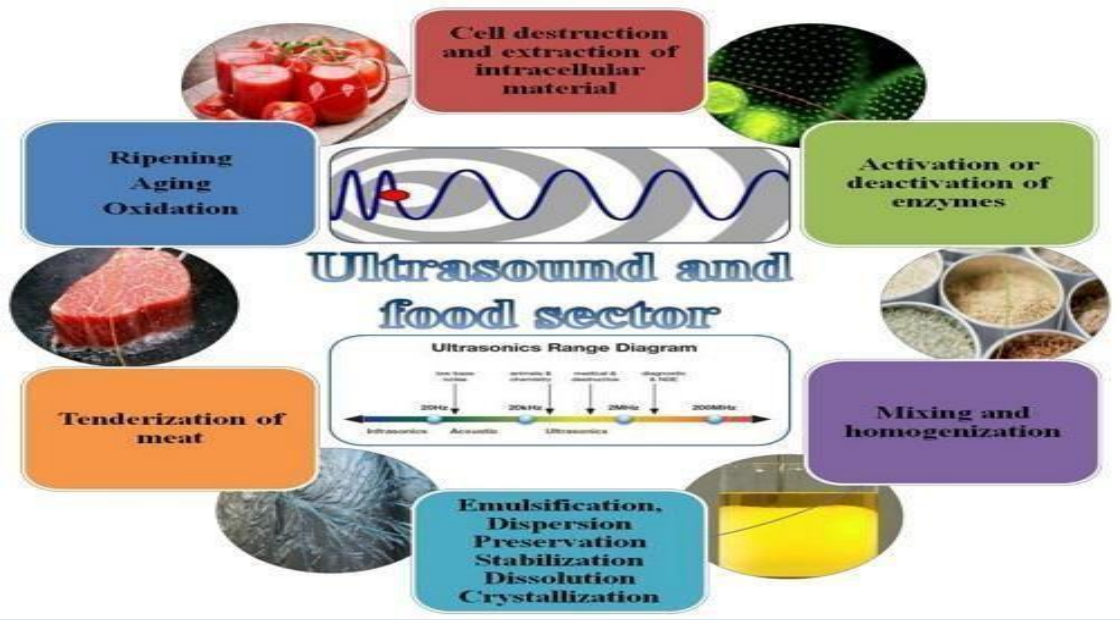
The effect of emerging non-thermal technologies and the processing parameters involved in the decontamination have been reviewed comprehensively along with the summary of different food products. A thorough understanding and deep insights into the mechanisms underlying the optimization of the process conditions will pave the way for upscaling these technologies for improved quality and sustaining the nutritional components of the food product..

Harjot singh (FT 8th)

7. Ultrasound as an emerging technology for the elimination of chemical contaminants in food.

The existence of chemical contaminants in food brings a serious threat to human health. Researchers have been making persistent efforts to eliminate contaminants from food to make it safe for human consumption. Traditional methods, such as washing with various agents, peeling, cooking and chemical oxidants, cannot achieve the desired results. In recent years, non-thermal technology, such as ultrasound, has attracted extensive attention as an emerging technology for removing food contaminants.

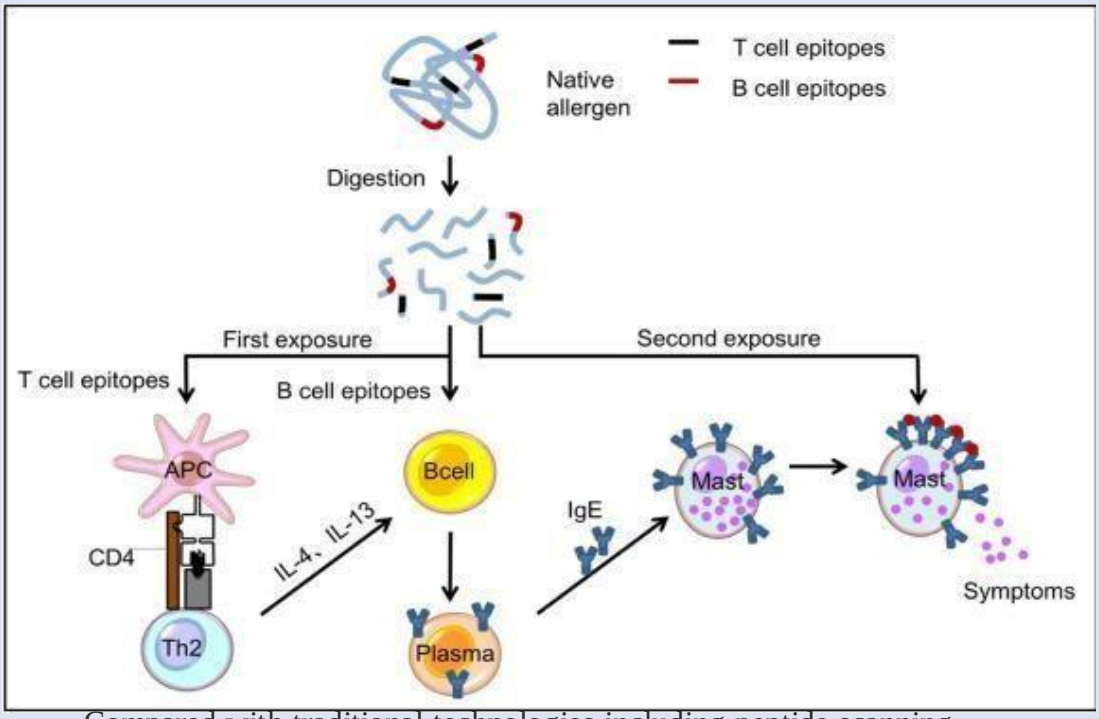
Ultrasound is a green processing technology, which would not impart secondary pollution. It also has advantages of high efficiency and low energy consumption, compared with traditional decontamination technologies. The combination of ultrasound with other techniques such as ultraviolet, ozone and pulsed electric field shows better decontamination effect. However, ultrasound treatment may cause degradation of some phenolic compounds and vitamins, changes in color, loss of anthocyanin and other adverse effects on food characteristics. In addition, the appropriate ultrasound processing system in terms of probe design, geometry, and operating conditions, needs to be specially designed for different food materials. Thus, some challenges need to be addressed to improve its application



Manmeet Singh (FT 8th)

8. Advances in epitope mapping technologies for food protein allergens

The incidence of food allergy has been increasing in recent years, but the prevention, diagnosis, and treatment of food allergy remain challenges in the world. Food allergen epitope mapping technology can help us identify the epitope sequence and structure, which is conducive to the development of food allergy prevention, diagnosis, and treatment methods.

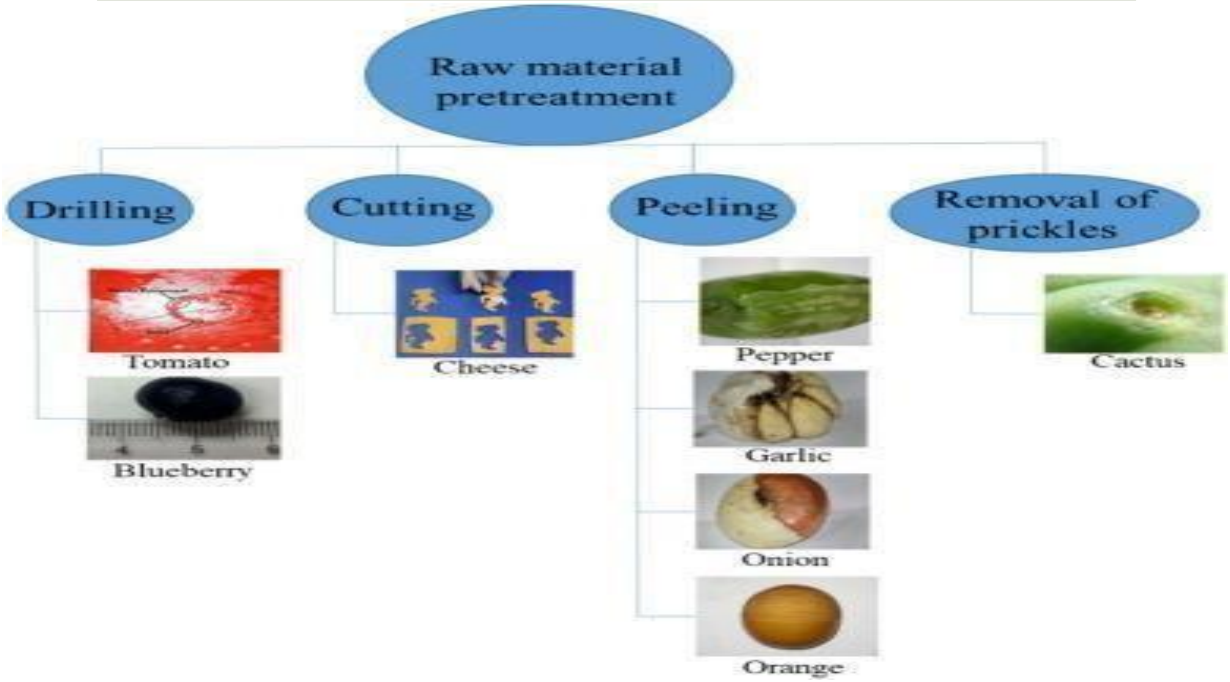


Compared with traditional technologies including peptide scanning technique, novel technologies have the advantages of high specificity, high sensitivity, high accuracy, and high-throughput. Although some progress has been made in the identification and characterization of food protein allergen epitopes, a large number of epitopes have not yet been identified so far.

Gaganpreet Singh (FT 8th)

10. Potential application of laser technology in food processing

The considerable demand for high-quality foods derives us to adapt and adopt novel automated technologies in order to reduce waste and increase nutrition and sensory quality of processed foods. The emerging area of laser-based technology has shown significant potential to enhance the quality and safety of foods due to the better monochromaticity and directivityof laser beams. Base on the applications of lasers in food packaging and food detection, laser- assisted food processing is a growing area arousing considerable interest among scientists in the past decade.



Base on thermal and photochemical process, lasers display great potential in the field of food processing including material pretreatment, drying, cooking, microbial inhibition, laser marking, extraction, fermentation and aging of liquid foods etc. The operational parameters of lasers and optical and thermal properties of the targeted material affect the quality of the products. To adapt current laser technology to industrial food processing it is necessary to offset some limitations, especially the control of thermal damage, establishment of mathematical models/databases, and automatic and safety processing equipment.

Loveneesh Singh (FT 8th)