دومین کنگره بین المللی بهداشت و صنایع غذایی

The 2nd International Congress of Food Technology and Hygiene

Abstract and Program Book

The 2nd International Congress of Food Technology and Hygiene

February 22-24, 2024

Ahvaz, Khuzestan Province, Iran

President of the Congress
Dr. Mohammad Hossein Sarmast

Vice President of the Congress
Dr. Mahmood Alebouyeh

Chairman of the Congressional Policy Council
Dr. Mohammad Esmaiel Motlagh

Scientific Secretary
Dr. Seyed Mohammad Ali Noori

Executive Secretary
Dr. Mohammad Hashemi

The Board Committee of Congress

Dr. Mohammad Hossein Sarmast

Dr. Mehdi Ansari-Dogaheh

Dr. Mohammad Esmaiel Motlagh

Dr. Mahmood Alebouyeh

Dr.Faramarz Khodaeian Chegeni

Dr.Masoud Mahdavinia

Dr. Mahdi Erfanifar

Dr. Bahram Dehghan

Dr.Mehrnoosh Zakerkish

Dr. Mohsen Cheki

Dr. Mohammad Hojjati

Eng. Alireza Najafi

Dr. Mohammad Hashemi

Dr. Seyyed Mohammad Ali Noori

Executive and Scientific Board of Congress (A-Z)

Dr. Seyed Saeeid Azandeh

Dr. Mahdi Ansari Dogaheh

Dr. Sara Bahrainian

Dr. Mohsen cheki

Eng. Alireza Najafi

Dr. Mohammad Hashemi

Dr. Bijan Helli

Dr. Mohammad Hojjati

Dr. Samaneh Hajjarzadeh

Dr.Faramarz Khodaeian Chegeni

Dr.Masoud Mahdavinia

Dr.Sahar Sabahi

Dr. Seyyed Mohammad Ali Noori

Dr. Reihaneh Sorourian

Dr.Milad Tavassoli

Dr.Mehrnoosh Zakerkish

Executive and Scientific Committee (A-Z)

Dr. Reza Abdulahi
Dr. Asma Afshari
Dr. Kasra Afshari
Eng. Afshin Afshari
Eng. Farshad Afshari
Dr. Hossein Ahmadi Chenarbon
Dr. Mohammad Alboyeh
Dr. Seyed Nasser Alavi
Dr. Akbari
Dr. Mohammad Baghernia
Dr. Sara Bahrainian
Dr. Farhad Barani
Eng. Mahmoud Charlang
Dr. Mahdi Ansari Dogaheh
Dr. Ali Ehsani
Dr. Arash Ershadi
Dr. Meghdad Eskandari
Dr. Soheil Eskandari
Dr. Ahmad Esmaillzadeh
Eng. Esmaili
Dr. Meisami Fard
Dr. Ali Fazalara
Dr. Hossein Mir Saeed Ghazi
Dr. Bahadur Haji Mohammadi
Dr. Samaneh Hajjarzadeh
Dr. Mohammad Hashemi
Dr. Mohammad Hassan Javanbakht
Dr. Bizhan Helli
Dr. Fatemeh Heydari
Dr. Mohammad Hojjati
Eng. Hosseinzade
Dr. Kurosh Jafarian
Dr. Seyed Ahmad Hosseini
Dr. Majid Javanmard
Dr. Hossein Jooyandeh
Dr. Fatemeh Kardani
Dr. Abulhassan Khalili
Dr. Faramarz Khodaian
Dr. Masoud Mahdavinia
Dr. Razzagh Mahmoudi
Dr. Siavash Maktabi
Dr. Anahita Mansoori
Dr. Zohreh Mashak
Eng. Mehdi Mateen Rad
Eng. Malik Muhammad Madmoli
Eng. Abdul Majid Mirzapour
Dr. Mohammad Esmaiel Motlagh
Dr. Ali Naseri
Dr. Seyyed Mohammad Ali Noori
Dr. Maryam Qadri
Dr. Mojtaba Raeisi
Dr. Mitra Rezaei
Dr. Reza Rezvani
Dr. Laleh Roomiani
Dr. Sahar Sabahi
Dr. Masoud Sami
Eng. Morteza Sanadizadeh
Dr. Shahram Shoaibi
Dr. Shiralipour
Dr. Reyhane Sorourian
Dr. Seyed Reza Sobhani
Dr. Mehrnoosh Tadayoni
Dr. Mahdi Talebi
Dr. Hamid Tavakoli Pour
Dr. Milad Tavassoli
Dr. Mahdi Zarei

Students Executive and Scientific Committee (A-Z)

Dr. Sara Bahrainian
Dr Samaneh Hajjarzadeh
Shahryar Ahmadi Hesar
Mehdi Arjmand
Zahra Asadi
Parisa Azimi
Fatemeh Bakhshipour
Yasamin Banitorof
Hediyeh Dasoomi
Yasaman Hosseini
Nastaran Jahani
Zahra Keinami
Mehdi Koupaee
Zeinab Lotfinia
Atena Mazraeh
Ghazal Mehrad
Fardis Mehraien
Mohammadreza Mohammadpour
Seyedeh Mobina Moosavi shafaat
Seyed Mehdi Naji
Mohadeseh Neisi
Seyed Jamal Pourmousavi
Kosar Qafuri
Shiva Sayah
Arash Seraj zadeh
Mohammad reza Shadmand
Reyhaneh Taghi pour
Zeinab Yari

Reviewers Committee

Head of peer-Review Commitee: Dr. Milad Tavassoli
Reviewers board (A – Z)

Reza Abedi
Dr. Sara Bahrainian
Behnam Bahramian
Alireza Ebrahimi
Dr. Negin Karami
Dr. Arezou Khezerlou
Dr. Sahar Sabahi
Dr. Naimeh Shabani
Dr. Yasser Shahbazi
Dr. Nasim Shaveisi
Dr. Maryam Shirani
Dr. Reihaneh Sororian
Dr. Milad Tavassoli

Poster Presentations

Application of Pickering Emulsion in Food Products: A review

Mehrpouya Veise[1], Fardin Tamjidi[2*]

1. MSc Student, Department of Food Science & Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran.

2. Assistant Professor, Department of Food Science & Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran.

Abstract: Pickering emulsion is an emulsion type whose interface is stabilized by solid particles instead of emulsifiers in conventional emulsions. Therefore, it may have better physical and safety characteristics and special applications compared to common emulsions. Pickering emulsion can be used in various products, including foods for different purposes such as encapsulation, control of release and delivery of bioactive, antimicrobial, and antioxidant substances, flavorings, etc., producing emulsion products with high stability, antimicrobial and antioxidant films, and hydrogels. This article is an overview of the comparison of Pickering emulsion with the conventional type, its production methods, and its potential as well as its possible challenges for utilization in the food industry.

Keywords*:* Pickering emulsion, Three-phase contact angle, Homogenization, Delivery of active substances

mehrpouya.veise@uok.ac.ir

*FardinTamjidi
Assistant Professor, Department of Food Science & Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran.

The effect of Cold Plasma on reduction of AFM1 in milk

Fatemeh Dezhgard[1], Fatemeh Hemmati[2,*]

1. M.Sc Student of Food Safety and Hygiene, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

2. Assistant Prof, Department of Food Hygiene and Quality Control, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract: Raw milk is a dairy product that provides energy and essential nutrients, such as minerals, vitamins, and proteins, to support the formation and maintenance of human tissue. Proteins and casein, two biologically significant macromolecules, have been shown to be essential for biochemical and physiological processes that have a significant impact on metabolism and human health. Due to high nutritional values of milk, it has classified as one of the most popular foods for individuals particularly for health of people. In fact, Cows eat feed contaminated with aflatoxin B1 which transform into aflatoxin M1 in their body and excrete in their milk. International Agency for Research on Cancer (IARC) has classified aflatoxin M1 as group1. Therefore, concentration of aflatoxin M1 in milk should be in the range of standard. Many studies have been conducted to reduce aflatoxin M1 in milk. One of these new methods is the cold plasma, which has a positive effect on reducing various toxins including AFM1. So, this study aimed to determine the effect of cold plasma on aflatoxin M1 in milk.

Keywords: Aflatoxin M1, Cold plasma, milk, detoxification.

Corresponding author: Fatemeh Hemmati

fhemmati88@gmail.com

Postbiotics, anti-biofilm agent in food industry

Mohammadreza Ziavand [1*]

Department of Food Science and Technology, Faculty of Nutrition & Food Sciences, Nutrition Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

Background: postbiotics are still a new idea in the food sector, there are promising future applications for these probiotic-derived substances. This review provides an overview of postbiotics, focusing on their safety and antibiofilm properties. It also discusses the encapsulation of postbiotics and their use in packaging films.

Methods: All articles related to the study subject were searched in the Scopus, PubMed/Medline, ISI Web of Knowledge, and Google Scholar database and studies that examined the The anti-biofilm effect of postbiotics were included.

Results: According to available evidences, postbiotics do not need the viability in comparison with their parent cells and they exert health effects like live probiotic cells. Also, their preparation and application in various delivery system is affordable, which this highlights the importance of postbiotics from technological, clinical and economic aspects. These Compounds with biological activities such as immune modulation, antimicrobial, anti-biofilm, Antioxidant and antiproliferative effects.

Discussion: As a new strategy, postbiotics can be used in a wide range of food products to delay spoilage, increase shelf life, and have an anti-biofilm effect in the food industry.

Keywords*:* Probiotic, Postbiotic, Food hygiene, Biofilm removal activity, Antimicrobial activity

*Corresponding Author : Mohammadreza ziavand
Department of Food Science and Technology, Faculty of Nutrition & Food Sciences, Nutrition
Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Mreza.zv9@gmail.com

Application of Pickering Emulsion in Food Products: A review

Mehrpouya Veise[1], Fardin Tamjidi[2*]

1. MSc Student, Department of Food Science & Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran.

2. Assistant Professor, Department of Food Science & Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran.

Abstract: Pickering emulsion is an emulsion type whose interface is stabilized by solid particles instead of emulsifiers in conventional emulsions. Therefore, it may have better physical and safety characteristics and special applications compared to common emulsions. Pickering emulsion can be used in various products, including foods for different purposes such as encapsulation, control of release and

delivery of bioactive, antimicrobial, and antioxidant substances, flavorings, etc., producing emulsion products with high stability, antimicrobial and antioxidant films, and hydrogels. This article is an overview of the comparison of Pickering emulsion with the conventional type, its production methods, and its potential as well as its possible challenges for utilization in the food industry.

Keywords*:* Pickering emulsion, Three-phase contact angle, Homogenization, Delivery of active substances

*FardinTamjidi
Assistant Professor, Department of Food Science & Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran

mehrpouya.veise@uok.ac.ir

The effect of Cold Plasma on reduction of AFM1 in milk

Fatemeh Dezhgard[1], Fatemeh Hemmati[2,*]

1. M.Sc Student of Food Safety and Hygiene, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

2. Assistant Prof, Department of Food Hygiene and Quality Control, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

Raw milk is a dairy product that provides energy and essential nutrients, such as minerals, vitamins, and proteins, to support the formation and maintenance of human tissue. Proteins and casein, two biologically significant macromolecules, have been shown to be essential for biochemical and physiological processes that have a significant impact on metabolism and human health. Due to high nutritional values of milk, it has classified as one of the most popular foods for individuals particularly for health of people. In fact, Cows eat feed contaminated with aflatoxin B1 which transform into aflatoxin M1 in their body and excrete in their milk. International Agency for Research on Cancer (IARC) has classified aflatoxin M1 as group1. Therefore, concentration of aflatoxin M1 in milk should be in the range of standard. Many studies have been conducted to reduce aflatoxin M1 in milk. One of these new methods is the cold plasma, which has a positive effect on reducing various toxins including AFM1. So, this study aimed to determine the effect of cold plasma on aflatoxin M1 in milk.

Keywords: Aflatoxin M1, Cold plasma, milk, detoxification.

Corresponding author: Fatemeh Hemmati

fhemmati88@gmail.com

A new honey adulteration detection approach using machine learning: a review

Fateme Asadi Touranlou[1,2], Mohamad Hashemi[1,2]

[1] Medical Toxicology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

[2] Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Honey adulteration is a concerning issue in the food industry, as it not only compromises the quality and authenticity of the natural product, but also poses potential health risks to consumers. Traditional analytical methods for honey adulteration detection often lack accuracy and are time-consuming. This review presents a new approach to honey adulteration detection using machine learning techniques, which shows promising results in improving the accuracy and efficiency of detection.

Methods: The review collects and analyzes recent studies on honey adulteration detection using machine learning. It focuses on the different types of adulteration and the corresponding machine learning algorithms employed. Furthermore, various features, such as physicochemical parameters and pollen analysis, used to train and test the machine learning models are discussed.

Results: The review highlights that machine learning algorithms, including support vector machines, random forests, and artificial neural networks, have been successfully applied to honey adulteration detection. These methods exhibit high accuracy rates and offer rapid detection results.

Discussion: This review discusses the challenges and potential solutions in implementing machine learning techniques for honey adulteration detection, such as the need for large and diverse datasets for training purposes. The use of machine learning techniques for honey adulteration detection represents a significant advancement in the field. This approach not only improves the accuracy and speed of detection but also provides a non-invasive and cost-effective solution. Further research is needed to address the limitations and expand the application of machine learning in this domain.

Keywords: honey; adulteration; machine learning

Correspond Author: Fateme Asadi Touranlou
Affiliation and Email address: Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Asadif4002@mums.ac.ir

Salep in Food: Benefits and Disadvantages

Fateme Asadi Touranlou[1,2], Mohamad Hashemi[1,2]

[1] Medical Toxicology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

[2] Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Salep, derived from the dried tubers of specific orchid species, has been historically used as a medicinal beverage and ingredient in traditional cuisine. Recently, salep has gained popularity due to its unique properties and potential health benefits. This review aims to assess the

benefits and disadvantages of salep consumption in food.

Methods: A comprehensive literature search was performed using various scientific databases to identify relevant studies on salep. Studies focusing on the physiological effects, nutritional composition, and potential risks associated with salep consumption were considered.

Results: Salep contains a high concentration of mucilage, a soluble fiber that aids digestion and promotes gastrointestinal health. It also possesses bioactive compounds such as polyphenols, flavonoids, and antioxidants, which contribute to its potential health benefits. Salep has been reported to exhibit antioxidant, anti-inflammatory, and anti-carcinogenic properties. Furthermore, its prebiotic properties stimulate the growth of beneficial gut bacteria, enhancing overall gut health. However, it is essential to consider potential disadvantages of salep consumption. Salep may trigger allergic reactions in individuals with orchid allergies or those prone to food sensitivities. High intake of salep-based products might lead to excessive consumption of carbohydrates, potentially causing weight gain or exacerbating existing health conditions.

Discussion: Overall, salep consumption can provide various health benefits attributed to its bioactive compounds and high fiber content. However, caution must be exercised regarding potential adverse effects, allergenicity, and individual differences in response. Further research regarding the optimal dosage and safety profile of salep in food is warranted to ensure its judicious use.

Keywords: Salep; Food; Benefits

Correspond Author: Fateme AsadiTouranlou
Affiliation and Email address: Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Asadif4002@mums.ac.ir

Investigating the foaming properties and drying kinetics of foam mat drying of red beetroot

Parisa Ghasemi[1*], Samaneh Heydari[1], Mohammad Noshad[1], Behrooz Alizadeh Behbahani[1]

[1]Department of Food Science and Technology, Faculty of Animal Science and Food Technology, Agricultural Sciences and Natural Resources University of Khuzestan, Mollasani, Iran.

Background: Foam-mat drying is a simple method of drying in which a semi-solid or a liquid, along with a suitable foaming agent, is dehydrated in the form of a foam mat at a low temperature. The foam thus formed is spread on the aluminum tray as a thin sheet and is exposed to hot air in the temperature ranging from 50 to 80°C. The higher mass transferrateint his drying technique is due to more porous foam structure and the larger liquid surface-area to-volume ratio, which ultimately reduces process time and enhances dried product quality.

Methods: In the present study, the foam mat drying technique was used to dry red beetroot extract. The effect of different egg white concentrations (4, 8, and 12%), whipping time (3 and 6 min) and temperature of 50 °C on the foam properties of red beetroot extract, including foam

density, foam expansion were investigated. Six thin-layer drying models were employed to determine the drying kinetics. The correlation coefficient (R^2) and the root mean square error (RMSE) were determined to evaluate the fit between the model and the experimental data. Analysis of variance (ANOVA) and Duncan's test (confidence level, $\alpha = 0.05$) were performed on the obtained results in order to establish significant differences.

Results: The results showed that an increase in the egg white concentration and a decrease in the whipping time produced a foamed red beetroot extract with low foam density and high foam expansion. The Wang and Singh model was the best model to describe the drying behaviour of foamed extract. According to Fick's second law model, the effective moisture diffusivity of the red beetroot extract ranged from 5.85×10^{-8} to 9.44×10^{-8} m^2 s^{-1}.

Discussion: The foam mat drying study revealed that with the increase in egg white concentration and the decrease in whipping time, the drying rate and the effective diffusivity values increased. The whipping time of 3 min produced the foamed red beetroot extract with better foaming properties than those produced by the whipping time of 6 min. The Wang and Singh model was found to be the best model providing the highest R^2 and the lowest RMSE at all drying treatments.

Keywords: Drying kinetics, foaming, whipping time.

*Correspond Author: Parisa Ghasemi Affiliation and Email address: Ph.D. Student, Food Science and Technology

Parisaghasemi2811@gmail.com

Prevalence, antibiotic resistance in Pseudomonas aeruginosa strains isolated from raw frozen meat of Alborz province

Zohreh Mashak [1,2] **Manizheh Rezaloo**[1,2,*]

1-Department of Food Hygiene.Karaj Branch.Islamic Azad University,Karaj-Iran.

2-Clinical Cares and Health Promotion Research Center,Karaj Branch,Islamic Azad University,Karaj-Iran.

Background: Pseudomonas aeruginosa strains are considered as the main causes of food spoilage and occasionally foodborne diseases. The present study was performed to evaluate the prevalence and antibiotic resistance in Pseudomonas aeruginosa strains isolated from frozen meat.

Methods: 60 samples of frozen meat were collected from supermarkets of Alborz province and transfer to the lab by ice-bag. Samples were cultured for the presence of bacteria . The pattern of antibiotic resistance was evaluated using the disk diffusion method.

Results: The prevalence of Pseudomonas aeruginosa in raw frozen meat samples was 13.33%, The isolates had the highest rate of antibiotic resistance including ,ampicillin ,penicillin and tetracycline (100,90.90 and 81.81) %. The lowest rate were imipenem and trimethoprim (9.09 and18.18) %.

Discussion: In previous studies, has reported the prevalence of Pseudomonas aeruginosa in imported frozen meat(6.67%), collected from retail stores . The high prevalence of Pseudomonas aeruginosa in samples may be due to the

high adaptability of the bacteria to low water activity and temperature. The high prevalence of antibiotic-resistant bacteria in frozen meat samples can indicates the insufficiency of these antibiotics to treat cases of Pseudomonas aeruginosa . Further studies are recommended to confirm the role of this bacterium as a spoilage and foodborne pathogen.

Keywords: Pseudomonas aeruginosa, Antibiotic resistance, Frozen meat,,Alborz province.

*Corresponding Author:
Manizheh Rezaloo
University of Islamic Azad Karaj Branch;
Karaj ;Iran,

m.rezaloo@kiau.ac.ir

Importance and role of slaughterhouse inspection of bovine leukosis in ensuring food safety

Javad Abbasi[1] ,**Zohreh Mashak** [2,3*]

1-Department of Animal and Poultry Health and Nutrition, Faculty of Veterinary Medicine, University of Tehran , Tehran, Iran.

2-Department of Food Hygiene.Karaj Branch.Islamic Azad University,Karaj-Iran.

3-Clinical Cares and Health Promotion Research Center,Karaj Branch,Islamic Azad

Background: Bovine leukosis is a viral zoonotic disease that can infect cattle. Blood, secretions, meat, dairy products and biological products may be contaminated with this virus. For this purpose bovine leukosis cases were studied during this 10-years in one of industrial slaughterhouses of Tehran province to thereby identify the factors of increasing incidence of this disease and to present effective ways to reduce it.

Methods: This study carried out in one of slaughterhouses of Tehran province. Inspections for about 132 leukosis bovine meats in the carcass of slaughtered cows with histopathological examination were conducted.

Results: The results were shows that among 132 leukosis cows, all of cases were maternal, over2 years old and mean weight of them were 180 kg. Most of them were in the summer. Most cases were seen in the carcass of the industrial farms (79.5%) and then the traditional farms (20.5%), respectively. In this study was diagnosed some symptoms in carcass of slaughtered cattle such as enlarged lymph nodes (external and internal iliac, deep inguinal and Prepectoral), heart and other organs with edema.

Discussion: For diagnosis improving and right slaughterhouse assessment and its role in human health, must be trained inspectors in the diagnosis of bovine leukosis properly. In addition histopathological studies are required in the slaughterhouse laboratory. Also control and eradication of diseases in farm seems to be effective in reducing disease

Keywords: Slaughterhouse inspection, Bovine leukosis, Histopathological findings, food safety

*Corresponding Author: Zohreh Mashak Karaj Branch , Islamic Azad University, Karaj ;Iran

mashak@kiau.ac.ir

Title: Approaches for increasing milk shelf life

omid hallajy poor[1]

1 undergraduate student, jundishapur university of medical science, Ahwaz, Iran

Background: Today, the process of milk preservation is becoming very important. The aim of this study is to survey the methods of increasing milk shelf life.

Methods: A systematic review considered all articles published in 2019 to 2024 by advanced search in PubMed and google scholar search engines using mesh term with inclusion criteria (studies only in English language, only clinical trials and cross-sectional studies) exclusive results (the studies performed that the quality of milk and its organoleptic features can be maintained very well by heating at different time spending)

Results: Studies have shown that Some of the most popular methods for enhancing milk's shelf life are pasteurization, sterilization and UHT (ultra-high temperature). Time and temperature are the most effective factors in this process. Although UHT is the safest method according to its high temperature and septic process for packing, some people do not accept its quality due to its ripe taste. Bye making some experiments, researchers understand that they can fix the problem by preparing high temperature and short time (HTST) but low temperature long time (LTLT) has inverse effect.

Discussion: Temperature control is the key for enhancing milk shelf life, but its effect on quality and organoleptic features can be variable according to the espended time for heating.

Key words: HTST, milk, temperature, time, UHT

omidhallajipoor@gmail.com

Application of silver nanoparticles in active food packaging

Zakiyeh Balouch Zehi[1,2], Shiva Rahati[1,2], Mohammad Ali Torbati[2], Milad Tavassoli[1,2], **Narges Kiani Salmi** [1,2 *]

1 Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.

2 Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

Background: Background: Research and development on new packaging materials extremely have grown protecting food from oxidation and microbial pollution. The growing demand of consumers to increase the shelf life of food products and protect them from foodborne diseases has increased the development and production of active packaging. Among nanoparticles, Silver nanoparticles (AgNPs) have been

extensively used in food packaging applications due to their superior physicochemical, biological and antimicrobial properties and can be combined with non-degradable and edible polymers for active food packaging.

Methods: This study used keywords application, silver nanoparticles (AgNPs), food packaging, shelf life and food safety to find relevant articles from Science Direct, Scopus, and PubMed databases.

Results: Reports have shown that AgNPs demonstrated better antimicrobial properties compared to metallic silver due to their very large surface area, which can make better interactions with microorganisms. In a study, the properties of the film matrix were enhanced by incorporating MgO/Ag NPs. This combination led to notable improvements in the material's properties: elongation at break increased by 25.14%, tensile strength by 30.67%, and water vapor permeability decreased by 42%. Additionally, the film showed superior food preservation capabilities and strong antibacterial properties.

Conclusion: The use of AgNPs in food packaging has shown great potential in improving the safety and shelf-life of food products. The antimicrobial properties of AgNPs can effectively inhibit the growth of bacteria, fungi, and other harmful microorganisms that can cause food spoilage and contamination. Moreover, AgNPs have been found to be non-toxic and safe for human consumption, making them a viable option for food packaging materials. However, further research is needed to fully understand the long-term effects of AgNPs on food products and the environment.

Keywords*:* nanoparticles, food packaging, shelf life, antimicrobial and antioxidant activity, polymers

Corresponding Author: Narges Kiani Salmi
Affiliation: Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

nkiani277@gmail.com

1. Enhancing sustainability: chitosan biopolymers with Ag nanoparticles for eco-friendly applications in food packaging

2. Development of cellulose-based bactericidal nanocomposites containing silver nanoparticles and their use as active food packaging

3. Antibacterial, antioxidant and fruit packaging ability of biochar-based silver nanoparticles-polyvinyl alcohol-chitosan composite film

4. Modified magnesium oxide/silver nanoparticles reinforced poly (butylene succinate-co-terephthalate) composite biofilms for food packaging application.

The use of prickly pear peel flour as a bioactive and functional ingredient in bakery industry

Zakiyeh Balouch Zehi[1,2], Shiva Rahati[1], Mohammad Ali Torbati[1], Milad Tavassoli[1], Narges Kiani Salmi [1, *]

1 Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.

2 Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

Background: Prickly pear is widely distributed in arid and semi-arid regions of the world. The peel of prickly pear fruit represents around half of the fruit and is discarded as waste products, thus becoming an environmental problem. Due to the high content of bioactive compounds such as phenolic compounds, flavonoids, and betalains, prickly pear peels could be conveniently used as a nutraceutical and functional ingredient in some food preparations, such as bakery products. This study evaluated related articles that have used prickly pear peel flour (PPPF) as a bioactive and practical ingredient in bakery products.

Methods: This study used keywords application, prickly pear peel flour, formulation, bakery products and bioactive compound to find relevant articles from Science Direct, Scopus, and PubMed databases.

Results: The results showed that the addition of PPPF to bread, biscuit and cake formulations improved the nutritional quality and sensory properties of the products. The composition of PPPF showed a significantly higher concentration of fibre, ash, and phenolic compounds compared to the control wheat flour. The bioactive compounds in the PPPF exhibited antioxidant, antimicrobial, and anti-inflammatory activities, which can provide health benefits to consumers. In another study, incorporating PPPF into bread dough up to a 20% concentration improved nutrient and bioactive compound content, with the 10% PPPF addition yielding the best leavening, volume, and sensory properties. The baking process preserved the bioactive betalains, indicating PPPF's potential as a functional bread ingredient.

Conclusion: The incorporation of prickly pear peel flour as a bioactive and functional ingredient in bakery products has shown promising results in improving the nutritional quality, sensory attributes, and health benefits of bakery products. This innovative approach not only helps reduce food waste but also offers a sustainable solution to create healthier and more functional bakery products. Further research and exploration into the potential applications of prickly pear peel flour in the food industry could pave the way for new opportunities in product development and consumer wellness. Therefore, the use of prickly pear peel flour as a bioactive and functional ingredient in bakery products can be a promising approach to reduce food waste and enhance the nutritional value of baked goods.

Keywords*:* application, prickly pear peel flour, formulation, bakery products, bioactive compound

*Corresponding Author Narges Kiani Salmi

zakiyezb@gmail.com

Exploring the Impact of Microplastics: Health Risks and Removal Methods

Fatemeh Tashi[1], Azam Yousefi[1], Asma Afshari[1]

1 Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background: The increasing production of plastic has led growing concern about inadequate plastic waste management. Microplastics (MPs) are small plastic fragments found throughout the environment, varying in size, structure, color, polymer type, and association with other pollutants. These particles, measuring less than 5 mm, can be mistakenly consumed by aquatic organisms and may accumulate in the human body over time. At the human level, larger microplastic particles are generally expected to be excreted through feces, while smaller particles have the potential to enter the systemic circulation within the body. This study aimed to exploring the impact of microplastics, health risks and removal methods.

Methods: The keywords "Microplastics in Water" and "Removal Methods" and "Health Risks" were searched in Google Scholar and PubMed until January 5, 2024.

Results: Evidence suggests a potential link between microplastics and lung, breast, colorectal, liver, and prostate cancers. Additionally, microplastics can damage the lungs, gastrointestinal tract, and cause asthma, inflammation, oxidative stress, and cell damage. Nano-Fe3O4 was used to magnetize microplastics, allowing for easy removal from water using a magnet. Remaining nano-Fe3O4 can also be recovered through magnetic forces, reducing the risk of secondary pollution. Other removal methods include biofiltration, membrane filtration, electrocoagulation, and chemical coagulation.

Discussion: Standardizing techniques for detecting and removing microplastics remains challenging due to their varied properties and the uncertainty of completely eliminating them from the environment. A universally adopted protocol is needed for consistent results, especially for monitoring emerging contaminants such as microplastics.

Keywords: Microplastics; Cancer; Removal methods; Health Risks

Correspond Author: Fatemeh Tashi Affiliation and Email address: Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Tashif4022@mums.ac.ir

The first report of Sheep Osteohemochromatosis in one of slaughterhouses of Tehran province-Iran

Javad Abbasi[1,2],**Zohreh Mashak[3]***

1. Department of Animal and Poultry Health and Nutrition,Faculty of Veterinary Medicine,University ofTehran,Tehran ,Iran.

2. Institute of Biomedical Research, University of Tehran, Tehran, Iran Department of Food Hygiene, Karaj Branch, Islamic Azad University; Karaj ;Iran

Background: Osteohemochromatosis is a rare congenital disease and probably affects all meat-producing animals, especially cattle, swine, and sheep. It is an inherited deficiency of an enzyme which is required for the normal synthesis of hemoglobin which results in an inadequate production of hemoglobin and an overproduction of porphyrins. The bones, teeth and urine of affected animals have a reddish-brown discoloration. Photosensitivity of unpigmented areas of the skin is also another sign which occurs in affected animals exposed to sunlight.

Methods: Carcasses of three sheep affected with osteohemochromatosis were found at a local abattoir of Tehran province. On post-mortem examination all bones were heavily pigmented and appeared pink to reddish in color.

Results: Histopathological examination of bone's sections showed the abundance of pigment and hemorrhage in bone tissue.

Discussion: In the present study, the carcass bones of three sheep from the same flock, after slaughter, were abnormally red in color, and after histopathological studies of the suspicious bones, osteohemochromatosis was confirmed in them.The carcasses of animals suffering from osteohemochromatosis cannot be consumed and must be confiscated. Of course, according to some sources of meat inspection, if the lesion is localized and not severe, after removing the bones and head of the animal, the rest of the carcass can be consumed tissue.

Keywords: Osteohemochromatosis, Sheep, BoneDiscoloration, Histopathological finding, slaughterhouse

*Corresponding author: Zohreh Mashak

jabbasi@ut.ac.ir

Benefits of iron supplementation for low birth weight infants: a systematic review

Masoumeh Rahimi[1, 2], Mahla Salarfard[3], Kowsar Hakami shalamzari[4], **Fatemeh Roudi * [5]**

1,3. PhD student in Reproductive Health, Faculty of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran.

1, 2. Deanship of Midwifery Department, Rabia Balkhi School of Nursing and Midwifery, Kabul, Afghanistan

4. MSc in Midwifery, Student Research Committee, Mashhad University of Medical Sciences, Mashhad, Iran

5. Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Background: Iron is an essential micronutrient that plays an important role in many cellular functions and processes, including growth and development. An adequate supply of iron, along with other micronutrients, is especially important for infants. A number of studies have reported on the effects of iron supplementation in low birth weight infants. However, no systematic review of the available evidence has been conducted to date. Therefore, the present study was conducted with the aim of a systematic review to investigate the effects of iron supplementation on blood iron status, growth, neurodevelopment and

the adverse effects of iron deficiency in low birth weight and premature infants.

Methods: Methodology: the databases of Google Scholar, Medline, Medline, Scopus, PubMed and SID were searched with the keywords of premature infants, premature children, iron consumption, iron supplements and underweight infants from 2010 to 2023.

Results: After completing the search and review of articles from a total of 38 articles, 27 studies were included in the final review. Oral iron supplements or iron-enriched formulas were used in the studies. The duration of treatment varied from 1 week to 18 months. Iron supplementation significantly increased hematologic measures of iron status (including hemoglobin, hematocrit, serum ferritin) relative to placebo or over time in most studies. All controlled studies that examined iron deficiency anemia (IDA)/ID reported a reduction in the prevalence of IDA/ID with iron supplementation. A dose-dependent reduction in the incidence of IDA/ID has been reported in several studies. Of the 8 studies reported on growth, none found significant effects on growth-related parameters (length, height, weight, and head circumference). Only 6 studies reported on improved neurodevelopment. No side effects, including oxidative stress, inhibition of nutrient absorption, or the need for ongoing blood transfusions, have been reported.

Discussion: Iron deficiency negatively affects global health, but efforts to identify optimal interventions are in progress. However, questions remain, particularly regarding the long-term risks, benefits and optimal interventions for low birth weight infants, as well as the extent of iron fortification in infant formula.

Keywords: premature, premature children, iron intake, iron supplements, low birth weight

roudif@mums.ac.ir

Effect of Calcium Fortified Foods on Health Outcomes : a systematic review

Masoumeh Rahimi[1, 2], Kowsar Hakami shalamzari [3], Mahla Salarfard [4], **Fatemeh Roudi** * [5]

1,4. PhD student in Reproductive Health, Faculty of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran.

1, 2. Deanship of Midwifery Department, Rabia Balkhi School of Nursing and Midwifery, Kabul, Afghanistan

3. MSc in Midwifery, Student Research Committee, Mashhad University of Medical Sciences, Mashhad, Iran

5. Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Background: Calcium supplementation and fortification are widely used strategies to prevent adverse outcomes in populations with low calcium intake, which are very common in low-income settings. This article aimed to investigate the effect of food fortification with calcium and to examine the methods of this fortification and to examine the results related to healt and economy with a review method.

Methods: Methods: the databases of Google Scholar, Global Health, Scopus, PubMed and SID were searched with the keywords calcium, fortification, main foods, Health from 2010 to 2023.

Results: after completing the search and review of articles from a total of 80 articles, 30 full-text studies were included in the final review. Most RCTs had a high risk of bias in randomization or blinding. Most of the participants were women and children aged 1 to 72 months, and the most interventions were with milk and bakery products with strength levels between 96 and 1200 mg/100 grams of food. Calcium intake in the intervention group increased between 460 mg (children) and 1200 mg (menopausal women). The most obvious effects were seen in children. The largest cost savings (43%) reported from calcium fortification programs resulted from prevented hip fractures in older German women. Conclusion: The results of the present review show the importance of paying attention to the issue that higher calcium consumption leads to calcium strength, benefits in children's height and children's bone health.

Discussion: The results of the present review show the importance of paying attention to the issue that higher calcium consumption leads to calcium strength, benefits in children's height and children's bone health. Some evidence from calcium supplementation shows controversial results regarding bone health benefits in older adults. Considering the low standard of living in most developing societies of the third world, the daily calcium intake of these societies is less than the required amount, and supporting the enrichment and increasing the production of calcium-enriched materials can increase the level of daily calcium intake with a small economic cost

Keywords: calcium, fortification , main foods, Health

roudif@mums.ac.ir

An overview of the properties and uses of hesperidin

Ahmad Taghi[1], Ameneh Ozhand[2], Farzaneh Iranpak[3], Keyvan Manouchehripour[4]

1 Bachelor of Nutrition Sciences, Sarvestan Islamic Azad University, Affiliation: food and drug administration of ahvaz jundishapur university

2 Master's degree in physical chemistry, ahvaz Shahid Chamran University, Affiliation: food and drug administration of ahvaz jundishapur university

3 Master's degree in food industry technology engineering, Tehran University of Science and Research (Khuzestan), Affiliation: food and drug administration of ahvaz jundishapur university

4 Master's degree in physical chemistry, Tehran University of Science and Research (Khuzestan), Affiliation: food and drug administration of ahvaz jundishapur university

Abstract: Hesperidin is a natural flavonoid that is found in high concentration in citrus fruits, and based on several studies that have been discussed in this article, it has many medicinal and therapeutic properties, which include anti-inflammatory and antioxidant properties, being a radiation protector and being effective in the treatment of skin diseases, treatment of type 2 diabetes, neurological diseases, and reducing the risk of heart diseases.

Large amounts of citrus fruits are consumed in the food industry to produce juice and resulting huge amounts of by products so including peels, seeds ,cells and membrane residues, which are a rich source of hesperidin, are often discarded; compared to synthetic medicines, it has low toxicity, side effects and ability to oral intake and due to its health promoting and pharmacological effects, it can be suggested as a suitable and natural compound in the treatment of ailments and diseases.

Keywords*:* Anti-inflammatory , Anticancer , Antioxidant , Hesperidin

*Corresponding Author: Ahmad Taghi food and drug administration of ahvaz jundishapur university

prodiett@gmail.com

Anti-nutritional compounds of cereals and their reduction methods

Mina Salari Shahri[1*] , Mohammad Ali Najafi[2]

Master's student in food industry engineering, Zabul University, associate professor at the Department of Food Industry Science and Engineering, Zabul University

Abstract: Cereals are used as staple food almost all over the world. Cereals are rich in minerals, but due to the presence of anti-nutritional factors (such as saponins, tannins, phytate, trypsin inhibitors and polyphenols), the bioavailability of these minerals is usually low. Phytic acid is the most important anti-nutrient substance that has a strong ability to combine with metal ions, especially zinc, calcium and iron, and is present in most grains and legumes. The purpose of this review is to know some of the anti-nutritional factors in cereals and measures to minimize their effects.

Keywords*:* Keywords: phytic acid, fermentation, anti-nutrient compounds, grains and legumes

minasalari194@gmail.com

Water safety in emergency situation: chemical and microbial contaminants

Azam Yousefi, Fatemeh Tashi, Asma Afshari

Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Safe drinking water is crucial during emergencies to prevent waterborne diseases. The risk of contracting such diseases increases when water comes into contact with potential sources of contamination. This study aims to investigate waterborne diseases, their impact, and propose solutions for ensuring water safety in emergency situations.

Methods: The keywords "Waterborne", "Diseases", "Chemical Contaminant" and "Microbial Contaminant" were searched in Google Scholar, PubMed and the CDC database until January 2024.

Results: During emergencies like floods, waterborne diseases worsen. The World

Health Organization (WHO) reports that these diseases account for about 3-6% of daily illnesses and cause over 1.5 million deaths annually. In the United States alone, the CDC found that in the year 2000, around 7.5 million cases of waterborne diseases occurred, resulting in 6,630 deaths. Floods also contribute to the spread of diseases carried by rodents, such as Hantavirus, Lassa fever, and Tularemia, as well as mosquito-borne diseases like dengue fever and Zika virus. Chemical pollutants, including polyfluoroalkyl substances, can enter water sources during floods, posing long-term health risks, including cancer and thyroid-related diseases. Furthermore, harmful algae blooms, fueled by pollutants, produce toxins harmful to humans and animals.

To secure water during emergencies, several methods have been recommended, including boiling water, using iodine tablets, chlorine dioxide, portable water filters, UV light, and solar disinfection.

Discussion: Therefore, the proposed solutions may not always guarantee water safety and, as a result, further investigation and preventive measures are needed in the future.

Keywords: Diseases, Emergency, Waterborne, Water safety

Correspond Author: Azam Yousefi Affiliation and Email address: Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

YousefiAz4022@mums.ac.ir

The Use of Artificial Intelligence in Enhancing the Sustainability of the Food and Nutrition System: A Systematic Review

Nasim Aslani[1*], Parastoo Amiri[1,] Taleb khodaveisi[2]

1. Department of Health Information Technology, School of Allied Medical Sciences, Lorestan University of Medical Sciences, Khorramabad, Iran

2. Department of Health Information Technology, School of Allied Medical Sciences, Hamedan University of Medical Sciences, hamedan, Iran

Background: The global food and nutrition system faces unprecedented challenges due to rapid population growth, climate change, and unsustainable practices. To address these issues and ensure a sustainable future, the utilization of artificial intelligence (AI) has gained substantial attention. This systematic review aims to explore and analyze the role of AI in enhancing the sustainability of the food and nutrition system.

Methods: A comprehensive search of electronic databases was conducted to identify relevant studies published between 2010 and 2022. Inclusion criteria encompassed research articles focusing on the application of AI in the food and nutrition system's sustainability, including food production, supply chain management, nutrition assessment, waste reduction, and consumer behavior analysis.

A total of 65 studies were identified and critically appraised.

Results: The findings revealed that AI offers numerous opportunities to revolutionize the food and nutrition system's sustainability. AI-powered technologies such as machine learning, neural networks, and data analytics enabled precise crop monitoring, leading to optimized resource utilization and reduced environmental impact. Additionally, AI-enhanced supply chain management systems facilitated efficient tracking, tracing, and authentication of food products, minimizing food fraud and wastage. In nutrition assessment, AI demonstrated its potential to generate personalized dietary recommendations by analyzing vast amounts of individual-specific data.

Discussion: This systematic review highlights the significant contributions of AI in improving the sustainability of the food and nutrition system. The integration of AI technologies holds tremendous potential to address the complex challenges that the global food system faces.

Keywords*:* Artificial intelligence, Food system, Nutrition system, Machine learning, Supply chain management

*Corresponding Author : Nasim Aslani Affiliation and Email Address: Department of Health Information Technology, School of Allied Medical Sciences, Lorestan University of Medical Sciences, Khorramabad, Iran

aslaninasim@yahoo.com

Quantitative measurement of pesticide residues in agricultural products from Khuzestan Province of Iran using GC-MS

Leila Nikravan[1], Seyyed Mohammad Ali Noori[2], Mohammad Hashemi[3], Aazam shamshiri[4], **Razieh Noroozi[5*]**

1. PhD Graduated from Food Hygiene, Faculty of Veterinary Medicine, Shahid Chamran University of Ahvaz, Ahvaz, Iran

2. Assistant Professor, Department of Nutritional Sciences, School of Allied Medical Sciences, Ahvaz

Jundishapur University of Medical Sciences

3. Assistant Professor, Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences,

Mashhad, Iran

4. Doctoral student of Department of Food Sciences and Technology,Tehran Medical Sciences, Islamic Azad University, Tehran, Iran.

*5. Doctoral student of Division of Food Safety and Hygiene, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Background: nowadays, food security is one of the important issues of human life, and fruits and vegetables have a significant contribution to people's nutrition pattern. The use of pesticides to preserve agricultural products is necessary due to population growth, which their excessive consumption and failure to comply with the preharvest+ interval (PHI) due to the lack of knowledge of farmers leads to an

increase in the residual risk of these toxins in agricultural products.

Methods: In this study, 100 samples of fresh agricultural products including 5 types of commonly consumed products (cucumber, tomato, apple, strawberry and lettuce) were collected from fruit and vegetable markets in Khuzestan province, Iran. After preparing the samples in the laboratory, the residues of 30 pesticides in these products were analyzed with three repetitions using GC-MS.

Results: Based on results of this study, the highest level of contamination was observed in cucumber (7.93%) and tomato (6.38%). The average of the highest toxic residue related to Butachlor was 178 µg/kg in cucumber and 119 µg/kg in tomato, which was more than the maximum residue limit determined by the European Union (EC).

Discussion: Considering the high residual concentration of the examined toxin in the tested products, it is necessary to train farmers to use recommended amounts, to control the PHI of pesticides for correct use of these toxin or replacing them with safer pesticides, especially in products that have fresh consumption.

Keywords: Food security, pesticide residues, agricultural products

*Corresponding Author Razieh Noroozi

Doctoral student of Division of Food Safety and Hygiene, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

r_noroozi@razi.tums.ac.ir

Occurrence and risk assessment of aflatoxin B_1 in Iranian breads and wheat-based products during traditional processing

Mohammadreza Rostami[1], Nabi Shariatifar[2], Ebrahim Molaee-Aghaee[2], Gholamreza Jahed-Khaniki[2], **Razieh Noroozi[3] ***

1. PhD Graduated from the Division of Food Safety and Hygiene, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran;

2. Division of Food Safety and Hygiene, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

3. *Doctoral student of Division of Food Safety and Hygiene, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Background: Aflatoxin B_1 (AFB_1) is a mycotoxin made by various fungal strains, which could be contaminated cereal-based products, such as bread and sweets widely consumed worldwide. This is the first survey on the fate of AFB_1 from samples of wheat flour obtained from Khuzestan province as the center of wheat production of Iran to various kind of traditional breads and bakery products.

Methods: The study evaluates the contamination levels of AFB_1 during the

bread-making process by high-performance liquid chromatography with fluorescence detection (HPLC-FLD); in addition, calculation of exposure assessment of AFB_1 through the consumption of these products.

Results: All flour samples were contaminated with AFB_1 in the range of 0.47-3.38 ng/g, which the lowest and highest contamination was regarding null flour and dark flour used in the preparation of cake and Sangak bread. AFB_1 levels in the mixed dough were the same and insignificantly lower than initial flour samples ($P > 0.05$), and were significantly decreased in the fermented dough and baked samples compared to the initial flour ($P < 0.05$). During the fermentation process, the lowest AFB1 reduction was observed, in cake and biscuit samples (8.5% and 6.5%), and the highest reduction percentage of AFB_1 was attributed to Sangak dough (24.2%).

Discussion: The average concentration of AFB_1 in various traditional breads was considered as follows: Tiri> Lavash> Sangak> Baguette> Barbari, and the highest and lowest AFB_1 levels for bakery product were observed in biscuits (1.15 ± 0.04 μg/kg), and cake (0.21 ± 0.01 μg/kg).

Keywords: Baking process, Breads, Mycotoxin, Traditional bakery product, Wheat flour.

*Corresponding Author Razieh Noroozi

Doctoral student of Division of Food Safety and Hygiene, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

r_noroozi@razi.tums.ac.ir

Trends in the Application of Postbiotics in Functional Meat Products: A Review of both Safety and Nutritional Values

Setayesh Zamanpour[1], Zeinab Hadadfar[2], Mohammad Hashemi[1, 3], Asma Afshari[1, 4,*]

[1] Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

[2] Department of Food Science and Nutrition, Faculty of Medicine, Determinants of Health Research Center, Gonabad University of Medical Science, Gonabad, Iran

3 Medical Toxicology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

4 International UNESCO center for Health-Related Basic Sciences and Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran

Background: The safety, nutritional value, and taste of fish, meat, and meat products can all be significantly impacted by microbial infections, potentially increasing the risks associated with their consumption. Probiotics, paraprobiotics, and postbiotics can all be used to ensure food safety. The objective of this review was to discuss the most recent applications of postbiotics related to safety goals for seafood, meat, and similar items, along with an assessment of their nutritional aspects.

Methods: To find studies related to the application of postbiotics in functional meat products, the keywords "Postbiotic" OR "Non-viable probiotics" OR

"Parapsychobiotics" OR "Paraprobiotics" OR "Heat-killed probiotics" OR "Ghost probiotics" OR "Metabiotics" OR "Cell-free supernatant" OR "Biogenic" OR "Tyndallized probiotics" OR "Probiotic lysates" AND "Meat" OR "Fish" OR "Poultry meat" OR "Meat products" were searched in Web of Science, Google Scholar, PubMed, and Scopus until 2023.

Results: The investigation was conducted on the potential uses of postbiotics in packaging, biopreservation, and biofilm management. In summary, research has demonstrated that health-promoting postbiotics possess antibacterial properties and can act as biopreservatives in meat, fish, and related items.

Discussion: Among the most common microbiological contaminants found in these items are various types of Enterobacteriaceae and Clostridium perfringens. The direct application of postbiotics using coating or spraying techniques is considered one of the best strategies for preserving fish, meat, and similar products. This research provides novel perspectives on the application of postbiotics derived from probiotics in food, particularly in the preservation of meat, fish, and related goods.

Keywords*:* Postbiotic, Meat products, Food safety, Shelf Life, Functional food

*Corresponding Author
• Asma Afshari
Affiliation and Email Address
• Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
• International UNESCO center for Health-Related Basic Sciences and Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran

Asmafshr@gmail.com

A Review of Drinking Water Quality in Various Types of Home Water Treatment Devices

Fatemeh Abrishami *[1], Roghayeh Nejati [2], Masoud Sami [3]

1 Student research center committee, Fasa University of Medical Sciences, Fasa, Iran

2 Department of Food Safety and Hygiene, School of Health, Fasa University of Medical Sciences, Fasa, Iran

3 Nutrition and Food Security Research Center and Department of Food Science and Technology, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran

Backgrounds: The assessment of the quality and safety of drinking water is always an important topic in public health. The use of household water treatment devices has become widespread in recent years due to water contamination. The objective of this study is to assess the quality of drinking water in home water treatment devices.

Method: In this review, a keyword search was conducted on, "Household water treatment," and "Drinking water quality," on Google Scholar, PubMed, and the Scientific Information Database (SID) without time restrictions.

Results: In home water treatment systems, most of the water minerals do not pass through the membranes, and the purified water contains lower concentrations of minerals. Chlorine is used as a disinfectant in municipal water treatment systems and prevents the growth of microorganisms. However, if its concentration falls below the specified limit, it can lead to its regrowth in drinking water. Studies indicate that Gram-negative bacteria such as Pseudomonas, Alcaligenes, Serratia, Shigella, Proteus and Gram-positive Bacillus have the highest prevalence in water isolates. Pathogens such as Helicobacter and Salmonella can survive in the biofilm of water distribution networks. **Discussion:** The various pollutants present in the water of each region determines the suitable type of home water treatment device. However, by using a suitable water treatment device with specific filters, it is possible to reduce pathogenic bacteria and chemical pollutants to safe and healthy levels.

Keywords: Drinking Water, Water Treatment Devices, Biofilm, chemical pollutants.

*Corresponding Author: Fatemeh Abrishami

mabrishami1@yahoo.com

Mycoprotein: an alternative to animal-based protein

Sara Basiri*

Department of Food Hygiene and Public Health, School of Veterinary Medicine, Shiraz University, Shiraz, Iran

The demand for alternative protein sources has increased as a result of the growing global population on the one hand, and climate change brought on by animal husbandry on the other. Plant- and microbial-based proteins and laboratory meats are some alternatives. Microbial proteins are produced by microorganisms such as bacteria, algae, fungi, and yeast. Mycoproteins are low-energy, low-fat, high-protein, and high-fiber compounds derived from the fermentation of filamentous fungi such as Fusarium venenatum. Mycoproteins are healthy sources of essential amino acids, carbohydrates, selenium, antioxidants, vitamins, and carotenes. However, the levels of vitamin B_{12} and iron in theme are lower than those in red meats. Customers' lipid profiles are improved and their energy intake is reduced by the fibrous chitin-glucan matrix of mycoprotein. There are no restrictions on climate or geography that affect the production of mycoproteins. The best example of a well-known mycoprotein product that is sold in 15 different countries is Quorn. Because of its nutritional profile, minimal environmental impact, and capacity to provide vegetarians and vegans a meat-like sensation, mycoprotein has becoming more and more popular as a meat substitute. Nonetheless, there are still some challenges with producing mycoprotein products on a large-scale. It's important to read food labels for any potential allergen information because, among other things, it has a greater RNA content than red meat and may cause gastrointestinal and allergy problems in certain people.

Keywords*:* Mycoprotein, Meat substitute, Protein, Nutrition.

*Corresponding Author Department of Food Hygiene and Public Health, School of Veterinary Medicine, Shiraz University, Shiraz, Iran,

basiri@shirazu.ac.ir

Microalgae-based functional foods

Sara Basiri*

Department of Food Hygiene and Public Health, School of Veterinary Medicine, Shiraz University, Shiraz, Iran

Microalgae, such as spirulina, chlorella, and other types of algae, are rich in essential nutrients, including protein, omega-3 fatty acids, vitamins, minerals, and antioxidants. Food microalgae species have been approved by the FDA as generally regarded as safe (GRAS). Microalgae derivatives can be commercialized as food supplements (i.e., powder and oil), ingredients (proteins, pigments, etc.), or additives. Microalgae-based products can become widely consumed by the public, especially by vegetarians, vegans, seniors, and whom likes new products with different flavors and colors. Microalgae biomass has been shown to provide a number of health benefits, including hypoglycemic activity, gastroprotective and anti-steatotic qualities, improvements in cognitive and behavioral dysfunction, and hypolipidemic qualities. Additionally, microalgae are often considered a sustainable food source, as they require minimal land and water resources compared to traditional agricultural crops. Despite the increased interest in the use of microalgae-based food products and supplements, there may be health risks associated with the natural toxins, allergies, and toxic contaminants that can be present during the cultivation, harvesting, and processing of microalgae products. A major challenge in microalgae cultivation systems is water quality because microalgae are at the base of the aquatic food chain pyramid and can accumulate inorganic contaminants. The techniques employed to collect and handle microalgae may have an effect on their safety. It's crucial to make sure the microalgae are processed in a safe, hygienic manner and come from clean, sustainable locations.

Keywords*:* Microalgae, Functional food, Safety, Nutrition.

*Corresponding Author Department of Food Hygiene and Public Health, School of Veterinary Medicine, Shiraz University, Shiraz, Iran,

basiri@shirazu.ac.ir

Identification of Necrotoxigenie *Escherichia coli* on broiler carcasses

Masood Sami*[1], Reza Ghanbar Pour[2], Fatemeh Abrishami[3]

1 Nutrition and Food Security Research Center and Department of Food Science and Technology, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran

2 Departments of pathobiology, Faculty of Veterinary Medicine, Shahid Bahonar University, Kerman, Iran.

3 Student research center committee, Fasa University of Medical Sciences, Fasa, Iran

Background: Necrotoxigenic Escherichia coli (NTEC) strains are one of the enteropathogenic pathotypes. NTEC strains have two types NTEC1 and NTEC2. These strains have virulence factor such as fimbriae, non fimbrial adhesins, cytotoxic necrotizing factor (CNF) and cytolethal distending toxins (CDTs). The purposes of this study were to determine the NTEC isolates and their prevalence in broiler carcasses.

Methods: In the current study 150 broiler carcasses were soaped. Samples were processed in Lactos MacConkey broth as enrichment medium and streak plate method on MacConkey agar was carried out for Escherichia coli (E. coli) isolation. Confirmed colonies were stored in Luria Bertani broth with 30% glycerol in – 20 c°. Multiplex PCR was undertaken to determine the positive isolates for cnf and cdt genes families.

Results: Among 380 obtained colonies, 314 E. coli isolates were confirmed after several exams. In first PCR step, 4 isolates possessed 466 bp fragment (cdt gene) and one of the isolates was positive for both cdt and cnf (1150 bp) genes. One strain was positive for cnf2 and cdtIII and three others were positive only for cdtIII.

Discussion: Prevalence of NTEC strain was 2.66% in chicken carcasses. Isolation of NTEC strains those possess virulence genes from chicken carcasses consider as public health importance.

Keywords: Escherichia coli, Necrotoxigenic, Cytotoxic necrotizing factors, Cytolethal distending toxins, broiler carcasse.

*Corresponding Author

Masoud_sami@nutr.mui.ac.ir

Fruits and Vegetables Biopreserved by Postbiotics

Setayesh Zamanpour[1], Zeinab Hadadfar[2], Mohammad Hashemi[1, 3], Asma Afshari[1, 4,*]

1 Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

2 Department of Food Science and Nutrition, Faculty of Medicine, Determinants of Health Research Center, Gonabad University of Medical Science, Gonabad, Iran

3 Medical Toxicology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

4 International UNESCO center for Health-Related Basic Sciences and Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran

Background: The safety, nutritional content, and flavor of fruits and vegetables can be significantly influenced by microbial contamination, posing potential hazards to consumers. Bacillus cereus, Campylobacter jejuni, Clostridium botulinum, E. coli O157: H7, Listeria monocytogenes, Salmonella spp., Shigella, Staphylococcus, and Vibrio cholera are among the most prevalent microbial contaminants found in these items. In the industry, postbiotics have been administered in a solution form for treating cut vegetables. This review aims to discuss the recent applications of postbiotics concerning the safety aspects of

fruits, vegetables, and related products, along with an assessment of their nutritional properties.

Methods: To find studies related to the application of postbiotics in fruits and vegetables, the keywords "Postbiotic" OR "Non-viable probiotics" OR "Parapsychobiotics" OR "Paraprobiotics" OR "Heat-killed probiotics" OR "Ghost probiotics" OR "Metabiotics" OR "Cell-free supernatant" OR "Biogenic" OR "Tyndallized probiotics" OR "Probiotic lysates" AND “Fruits” AND “Vegetables” were searched in Web of Science, Google Scholar, PubMed, and Scopus until 2023.

Results: Research explored the possible uses of postbiotics in biopreservation, packaging, and biofilm management. Summing up, available studies substantiated the antimicrobial capabilities of beneficial postbiotics, indicating their potential as biopreservatives in fruits, vegetables, and associated products.

Discussion: Ensuring food safety is a crucial concern in the contemporary world, impacting people globally. The assurance of food safety can be achieved through the utilization of postbiotics, probiotics, and paraprobiotics. This study will provide fresh perspectives on the utilization of postbiotic food applications derived from probiotics for preserving fruits, vegetables, and related items.

Keywords*:* Postbiotic, Fruits, Vegetables, Food safety Shelf Life, Functional food

*Corresponding Author
• Asma Afshari
Affiliation and Email Address
• Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
• International UNESCO center for Health-Related Basic Sciences and Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran

Asmafshr@gmail.com

Food Safety Early Warning Tools and Emerging Risk Identification: Tracking the Gaps and Barriers

Setayesh Zamanpour[1], Asma Afshari[1, 2,*]

1 Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

2 International UNESCO center for Health-Related Basic Sciences and Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Early warning systems are proactive systems based on the prediction of emerging food safety hazards. The purpose of this paper is to review the various gaps and barriers identified in the literature regarding technologies used for food safety early warning and emerging risk identification. Future directions are also presented. In fact, the main goal is to help authorities and industry prepare and take timely action to prevent or mitigate future risks.

Methods: To find related studies, the keywords "Food Safety" AND "Early Warning Tools" OR "Emerging Risk Identification" AND "Gaps" OR "Barriers" were searched in Web of Science, Google Scholar, PubMed and Scopus until 2023.

Results: Real-time and diverse data are prerequisites for modern warning systems that can be enhanced with artificial intelligence (AI) and machine learning (ML) technology. In recent years, Biosensors, the Internet of Things (IoT), and blockchain technologies – as well as ML techniques such as Bayesian and neural networks – have made significant progress in food safety early warning and emerging risk detection using Big data and AI. In low- and middle-income countries (LMIC), where reliable Internet access, infrastructure and facilities for data collection and storage are lacking, and where processing may be challenging, gaps and barriers to adoption of food safety early warning tools and identification of emerging hazards have been identified.

Discussion: Identification and early warning of food safety risks are both a national and international issue that needs more attention and concerted multidisciplinary efforts to be effective management and achieve the final result.

Keywords*:* Food Safety, Early Warning Tools, Emerging Risk Identification, Gaps, Barriers

*Corresponding Author
- Asma Afshari

Affiliation and Email Address
- Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
- International UNESCO center for Health-Related Basic Sciences and Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran

Asmafshr@gmail.com

Examining the evaluation and selection model of service and equipment suppliers in the food industry based on hierarchical analysis

Hadi Goudarzi

Master of Strategic Management, Ahvaz, Khuzestan, Iran.

Background: One of the important factors of survival in today's highly competitive environment is reducing product production costs. Choosing the right suppliers can significantly reduce the purchase costs and increase the competitiveness of the organization, because in most industries, the cost of raw materials and product components is a major part of the total price. It includes the product.

Methods: In this article, on the basis of hierarchical analysis, verbal expressions provided by organizational experts have been used to evaluate and determine the performance of each supplier in relation to each criterion and determine the weight of the criteria.

Results: . Based on the obtained results, the sub-criteria of activity quality and technical knowledge, performing activities on time and flexibility in financial matters had a greater impact on the selection of suppliers, and the sub-criteria of early invoice delivery, good reputation, how to deal with The customer, the adequacy of manpower and practical experience were given the lowest priority.

Discussion: Activists in the field of food industry should pay attention to the determination of the most suitable supplier as a strategic factor in the supply chain by applying the criteria of the mentioned model.

Keywords*:* Suppliers, supply chain, selection and evaluation, fuzzy decision making, hierarchical analysis

hadigoodarzi@gmail.com

Carbon dots; Emerging carbon nanomaterials and Their Application in Food Safety and Analysis

Hossein Hashemi[1], **Reza Mohammadi**[2], **Hadiseh Ebdali**[3*]

*3,1 Student Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran

2 School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran

Background: Food safety is connected to public health, making it crucial to protecting people's health. Food analysis and detection can assure food quality and effectively reduce the entry of harmful foods into the market. Carbon dots (CDs) are an excellent choice for food analysis and detection attributable to their advantages of good optical properties, water solubility, high chemical stability, easy functionalization, excellent bleaching resistance, low toxicity, and good biocompatibility.

Scope and approach: This paper focuses on the optical properties, synthesis methods, and applications of CDs in food analysis and detection, including the recent advances in food nutritional composition analysis and food quality detection, such as food additives, heavy metal ions, foodborne pathogens, harmful organic pollutants, and pH value. Finally, this review also discusses the potentially toxic effects, the challenges, such as how to explain the diversity of fluorescent properties, and prospects of CDs in basic research and applications.

Key findings and conclusions: The problems in the food supply chain are very prominen, from farm to fork. CDs have recently garnered interest because of the high biocompatibility, straightforward synthesis method, and potential for a variety of innovative applications. CDs were prepared from any carbon source, such as food waste, food, chemicals, and plants. The rapid detection of food toxins has sparked considerable attention. Carbon dots have a promising future in fluorescence detection of food contaminants due to their significant properties. We hope that this review can provide valuable information to lay a foundation for subsequent research on CDs

and promote the exploration of CDs based sensing for future food detection.

Keywords*:* Carbon dots, Fluorescence, food analysis, Application, Nanomaterials, Food safety

*HadisehEbdali
Student Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran

hadisehebdali@gmail.com

A Short Review on The Effect of Enriching Meat Products by Using Dietary Fibers

Negar Sabet Sarvestani[1], Fahimeh Jahanifard[2]

Setare Yakhi Asia Co. (B.A Production Group), Shiraz, Iran

Abstract: Meat is an essential part of human nutrition due to having rich sources of protein, essential amino acids, fatty acids, vitamins and minerals. So, it provides the necessary energy for growth and plays an important role in various biochemical, metabolic and physiological activities. Although meat is a basic source of protein, it lacks dietary fiber, which is an indigestible and essential carbohydrate component. Dietary fibers are basically obtained from various grains, legumes, fruits, vegetables and their by-products and have nutritional, functional and health benefit. Like lignin, cellulose, pectin, gums and waxes which remain unaffected to the hydrolytic action of the endogenous enzymes of the human alimentary track. Therefore, by adding these compounds to meat products, the physicochemical, textural and organoleptic properties of these products can be improved. Also, the use of these compounds in food products is effective on controlling various diseases such as obesity, types of cancers, type 2 diabetes, cardiovascular diseases and bowel disorders. These dietary fibers can also be used in meat products as an efficient extender/binder/filler to reduce the cost of production by increasing the cooking yield. Additionally, they can be used as a fat substitute to minimize unhealthy fat content. In recent years, developing dietary fiber-enriched meat products and their effect on various physicochemical, functional and sensory characteristics has been noticed among food scientists and researchers.

Keywords*:* Dietary Fiber, Physicochemical Properties, Textural Properties, Organoleptic Properties, Fat Substitute, Food enrichment

Negar.Sabet1374@gmail.com

A new delivery system in food industry: Baker's yeast as SLN

Bahareh Samakar[1]*, Vahid Soheili[2], Bibi Sedigheh Fazly Bazzaz[3,2]

1 Ph.D. Candidate of Pharmaceutical Control, Pharmaceutical Control Department, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran.

2 Pharmaceutical Control Department, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran.

3 Biotechnology Research Center, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran.

Background: Baker's yeast (Saccharomyces cerevisiae) as a delivery platform has several advantages including low cost, simplicity of process and commercial availability. Encapsulation of bioactives in yeast cells plays a significant role in increasing their efficacy, stability, and bioavailability. In this study, the encapsulation of several compounds which could be beneficial in functional food including antimicrobials, antioxidants, flavors, and probiotics has been introduced.

Methods: Yeast cells were cultured in YPD media and incubated. They were harvested by centrifugation followed by washing and freeze drying. To enhance the encapsulation efficiency, yeast cells were pretreated with plasmolysers. Then, the encapsulation was conducted through different techniques including spray-drying and freeze drying. Finally, the efficiency was determined by HPLC method.

Results: As determined by various methods, bioactives were efficiently encapsulated into yeast cells. Moreover, encapsulation of bioactives enhanced their effects and stability. Furthermore, their activity was preserved during baking and storage.

Discussion: It could be considered that the cell wall compound of *S. cerevisiae* is a suitable protective coating, and it can improve the survival of bioactives within food products. In conclusion, Baker's yeast has the potential to be employed in the food and pharmaceuticals as beneficial carriers with different applications.

Keywords: Baker's yeast, Bioactives, Encapsulation, Food industry, Functional food, Saccharomyces cerevisiae.

*Presentor: Bahareh Samakar Ph.D. Candidate of Pharmaceutical Control, Pharmaceutical Control Department, School of Pharmacy, Mashhad University of Medical Sciences (MUMS), Mashhad, Iran

samakarb991@mums.ac.ir

Biopolymeric Nanoparticles, Pickering Nanoemulsions and Nanophytosomes for Loading of Zataria multiflora Essential Oil as a Biopreservative

Mansoureh Taghizadeh[1]

[1] Department of Food Science and Technology, National Nutrition and Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background and Aims: Essential oils include low solubility, poor bioavailability and rapid release, which may limit their use as bioactive compounds in foods and medicine. Nanoencapsulation can preserve inherent qualities of essential oils and improve their physicochemical characteristics and health benefits. Focus of the present study was on the loading of essential oils from *Zataria multiflora* in pickering nanoemulsions, nanoparticles and nanophytosome. In addition, the present study assessed how these systems affected their physicochemical characteristics and antioxidant and antimicrobial activities, compared to free-essential oils.

Materials and Methods: Encapsulation of Zataria multiflora Boiss essential oil in nanocarriers as a novel phytoconstituents delivery system was carried out using three various methods. Physicochemical characterization of nanocarriers was studied using dynamic light scattering, Fourier transform infrared spectroscopy, field emission scanning electron microscope, confocal laser scanning microscopy, optical microscope and antioxidant activity. The minimum inhibitory and bactericidal concentration assessment effects against Listeria monocytogenes at 24 h and temperatures (10, 25 and 37 °C) were investigated. Encapsulated Zataria multiflora Boiss essential oil with subinhibitory concentrations (0.25, 0.5 and 0.75) in hamburger formulation was selected as a food model for chemical, microbiological and sensory characteristics assessment.

Results and Conclusion: In general, this study compared three types of biocarriers with free essential oils. Primarily, nanophytosome showed promising results in delaying oxidation and in antimicrobial and sensory assessments, compared to two other nanocarriers. In conclusion, essential oil nanophytosomes of Zataria multiflora Boiss include the potential as an efficient natural food preservative.

Keywords: Emerging nanocarriers; Meat products, Nanophytosome; Pickering Nanoemulsions; Shelf life

*Corresponding author
Mansoureh Taghizadeh

Department of Food Science and Technology, National Nutrition and Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran

m_taghizadeh@sbmu.ac.ir

The effect of food additives on human gut microbiota and dysbiosis

Pooneh Bathaei[1], Mohsen Imenshahidi[2*]

1,2 Pharmaceutical Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran; Department of Pharmacodynamics and Toxicology, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran.

Background: The advance of technology has led to the development of new equipment and ingredients to meet the needs of large-scale food production. One such example is food additives which are used for various purposes as preservatives and shelf-life extenders, sensory properties -aroma, taste, texture, and appearance-modifiers, processing aids, and fortifying agents. Despite all the benefits and assistance to the food manufacturing industry, food additives are linked to various health concerns: ADHD, allergic reactions, asthma, digestive disorders, hypertension, obesity, potentially cancer, etc. The current study aims to evaluate the effect of some common food additives on gut microbiota and dysbiosis.

Results: Based on the nature of food additives, these compounds possess negative, neutral, and rarely positive impacts on the gut microbiome. Artificial sweeteners such as saccharine, sucralose, and aspartame have been shown to alter the gut microbiota composition resulting in

glucose intolerance and weight gain. On the other hand, since most sugar alcohols can be fermented by gut bacteria, they may act as prebiotics. Emulsifiers like CMC and polysorbate 80 may induce chronic gut inflammation by increasing bacterial proinflammatory molecules. Monosodium glutamate had no significant impact on the community structure and function of the intestinal microbiome in a cohort study. Preservatives like sodium nitrite can highly affect the gut microbiota composition resulting in dysbiosis and microbiome-related diseases.

Discussion: additives although possess various roles in food production, can cause various health issues through several mechanisms; Therefore, it seems that stricter rules should be established regarding the use of these substances in the food industry.

Keywords*:* food additives, gut microbiota, dysbiosis, preservatives

*Corresponding Author: Mohsen Imenshahidi
Affiliation: Pharmaceutical Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical

Sciences, Mashhad, Iran; Department of Pharmacodynamics and Toxicology, School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran

imenm@mums.ac.ir

Penicillin residue detection in milk using ultrahigh selectivity electrochemical aptasensors based on metal-organic frameworks Ag(I)

Roshanak Hasani

Department of food safety and Hygiene, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran

Background: Penicillin is an antibiotic that is usually prescribed to treat and prevent various bacterial infections. However, it may cause allergic reactions in people who are sensitive to it. For the detection of penicillin, two MOFs (metal-organic frameworks) based on Ag(I) with different anions (SiF62– versus CH3SO3–) were designed and prepared using an electrochemical method.

Methods: Crystal samples were synthesized to create aptasensors. The gold electrode was polished, immersed in H_2O_2/H_2SO_4 solution for 30 min, sonicated and dried to obtain Ag-MOF/AE. The electrode was coated with the aptamer solution and incubated for 2 h to fabricate the aptasensor. The detection limit of penicillin and its selectivity were checked and finally raw milk with different concentrations of penicillin was used to test the real applicability of the aptasensor.

Results: The aptasensor has a high linear correlation coefficient (R_2 = 0.9957) and a limit of detection of 0.849 pg/mL in the concentration range of 0.001 to 0.5 ng/mL.

Discussion: After immersing Apt/1/AE in a penicillin solution for 2 h, the resulting penicillin/Apt/1/AE showed a significant decrease in redox peaks of $[Fe(CN)_6]^{3-/4-}$. This indicates that penicillin can be

effectively adsorbed onto the modified AE through the interaction between penicillin and the aptamer. Consequently, the thickening on the modified AE surface with poor electrical conductivity significantly hinders the electron transfer of $[Fe(CN)_6]^{3-/4-}$. These behaviors suggest that the 1-based aptasensor could be a promising candidate for detecting penicillin.

Keywords*:* Electrochemical aptasensors, Metal-organic frameworks, Milk, Penicillin

Corresponding Author (Roshanak Hasani) Affiliation (Department of food safety and Hygiene, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran)

hasaniro9913@yahoo.com

Designing a luminescent sensor with a nanostructured molecular coating based on a zirconium metal-organic framework coated with polymer for the accurate and selective diagnosis of chloramphenicol residues in milk and honey

Roshanak Hasani

Department of food safety and Hygiene, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran

Background: Chloramphenicol (CAP) is a drug used to treat bacterial infections in humans and animals. Overuse can cause side effects. A fluorescent sensor, MIP/Zr-LMOF with low cost, high sensitivity and accuracy, has been studied for the detection of CAP and antibiotic residues in milk.

Methods: Zr-LMOF was synthesized using the surface printing method along with the sol-gel process. The mixture was sonicated for 15 minutes using an ultrasonic bath. Different volumes of CAP standard solution (with concentrations of 0.06, 0.3, and 1.5 mM) were then injected successively. All solutions were thoroughly sonicated and a calibration curve was plotted. The sensor's selectivity was also tested using some antibiotics through the fluorescence spectrum. CAP standard solution in five different concentrations was added to milk and honey for further testing.

Results: MIP/Zr-LMOF has a linear range of 0.16 to 161.56 µg/liter, the limit of detection (LOD) for milk and honey is 0.11 and 0.013 µg/liter, respectively, and the recovery percentage is between 96 and 105%. Finally, the regression equation is $R_2 = 0.9984$ and $R_2 = 0.9987$ was reported.

Discussion: The study aimed to explore the fluorescence response of MIP/Zr-LMOF, ZrLMOF, NIP/ZrLMOF, and MIP in the presence and absence of CAP. The results show that no fluorescence intensity is observed for MIP in the absence of CAP. Thus, it can be concluded that the fluorescence of MIP/Zr-LMOF comes from the Zr-LMOF component.

Keywords*:* Chloramphenicol, Honey, Milk, Metal-organic framework, Molecularly imprinted polymer, Turn-on sensor.

Corresponding Author (Roshanak Hasani) Affiliation (Department of food safety and Hygiene, School of Public Health, Zanjan

University of Medical Sciences, Zanjan, Iran)

hasaniro9913@yahoo.com

Effect of Air Fryer on Polycyclic Aromatic Hydrocarbon (PAH) Formation

Sara Matinfar, Mohammad Hashemi

Departmen of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Air fryers, with minimal oil consumption and reduced production of harmful substances, are the focus of this study, which examines the relationship between them and the presence of PAHs.

Methods: In this study, articles were retrieved from databases such as Google Scholar, PubMed, and ISI by using keywords like "air fryers" and "PAH" for the period from 2018 to 2023.

Results: The obtained results reveal that the increased presence of unsaturated fatty acids in frying oil contributes to higher PAH production. The reduced total PAH content in air-fried samples, compared to deep-fat-fried ones, can be attributed to the significantly lower volume of oil utilized. In alignment with this finding, various tests were conducted on diverse food items, affirming this correlation. For instance, deep-fat fried chicken exhibited PAH levels ranging from 2.60 to 3.17 µg/kg, whereas air-fried samples showed values ranging from 1.96 to 2.71 µg/kg. Moreover, air frying is reported to result in 90% less oil absorption in potato chips compared to traditional frying. This declining pattern was also observed in fried potatoes and potato chips.

Discussion: In conclusion, this study indicates a reduction in the levels of PAH in air-fried foods. However, further research is needed to enhance our understanding of this area and complement these findings.

Keywords*:* Air Fryer, PAH, Food

Corresponding Author: Sara Matinfar Affiliation and Email Address: Departmen of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Matinfars4022@mums.ac.ir

Air Frying and Acrylamide Production: a review of literature

Sara Matinfar, Mohammad Hashemi

Departmen of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Air fryers play a pivotal role in mitigating the health risks associated with acrylamide, a harmful substance prevalent in fried foods. This study aims to investigate the relationship between air fryers and acrylamide production.

Methods: In this study, databases such as Google Scholar, PubMed, and SID with the keywords airfryer and acrylamide from 2020 to 2023 were examined. And finally, five articles were selected for review.

Results: The results indicated that in four articles, a decrease in acrylamide levels occurred during air frying. Air-fried chicken meats exhibited acrylamide levels ranging from not detected (n.d.) to 3.49 µg/kg, while deep-fat-fried chicken meats ranged from n.d. to 6.19 µg/kg. Colorimetric analysis detected variations in sturgeon steaks during an experiment, associating elevated acrylamide levels with increased redness during frying (acrylamide rises after 15 minutes at 190 °C), but this rise is less than conventional frying. The findings showed that air-frying (AF) at 170°C for 8 minutes resulted in a reduced acrylamide concentration (21.8 ppm) in french fries. However, in a separate study, this trend was observed to be increasing. The acrylamide concentration in oven-fried food was found to be lower than that in air-fried food, especially in cupcakes and
potatoes.

Discussion: Thus, our analysis of studies indicates that the application of an air fryer can effectively inhibit the formation of acrylamide in most instances. Future research on a wider range of meals is necessary to bring this knowledge closer.

Keywords*:* Air Fryer, Acrylamide, Food

Corresponding Author: Sara Matinfar Affiliation and Email Address: Departmen of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Matinfars4022@mums.ac.ir

Preparation of active packaging of chitosan/gelatin containing carbon dots doped with zinc oxide/lemon peel

Behnam Bahramian[1], Narges Kiani-Salmi[1], Alireza Ebrahimi[1], Arezou Khezerlou[1], Milad Tavassoli[1] *

1. Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background: Food packaging maintains the safety and quality of food. Because today's packaging is based on petroleum derivatives that cause damage to health and the environment, recent studies have been directed towards biodegradable packaging. Carbon dots have recently been used as fillers in active packaging matrices due to their antioxidant, antimicrobial, biocompatibility, cost-effectiveness, and light protection properties.

Methods: Active composite films based on chitosan/gelatin containing carbon dots doped with zinc oxide/lemon peel were made by casting method, and then the mechanical, antimicrobial, antioxidant and barrier properties were investigated.

Results: Chitosan/gelatin film containing carbon-doped zinc oxide/lemon peel showed good mechanical properties, strong antioxidant properties, protection against ultraviolet rays and strong antimicrobial activity (complete eradication of *Listeria monocytogenes* and *Escherichia coli*).

Discussion: Antimicrobial, antioxidant and barrier properties of films used in active packaging are necessary to ensure the safety of food products and increase shelf life. Activated chitosan/gelatin packaging film containing carbon dots doped with zinc oxide/lemon peel can be an antioxidant and antimicrobial packaging material to prevent quality loss due to oxidation and microbial contamination during storage.

Keywords*:* Food packaging, Carbon dot, Food safety

*Corresponding Author: Milad Tavassoli Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran,

mtavassoli2006@gmail.com

Preparation of active packaging of Soy protein isolate/Methyl cellulose with anthocyanins/carbon dots derived from Mirabilis jalapa extract for food packaging application

Alireza Ebrahimi[1], Narges Kiani-Salmi[1], Behnam Bahramian[1], Arezou Khezerlou[1], Milad Tavassoli[1] *

1. Student Research Committee, Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background: Food packaging guarantees product safety and quality. Since today's packaging is based on petroleum derivatives and takes years to decompose, recent studies have been directed towards biodegradable packaging. Recently, carbon dots have recently attracted attention as fillers due to their antioxidant, antimicrobial, biocompatibility, cost-effectiveness, and light-protection properties.

Methods: Active composite films based on Soy protein isolate/methylcellulose containing carbon dots were made by casting method and then the mechanical, antimicrobial, antioxidant and barrier properties were investigated.

Results: Soy protein isolate/Methyl cellulose films containing anthocyanins/carbon dots derived from Mirabilis jalapa showed good mechanical properties, strong antioxidant properties, protection against ultraviolet rays and strong antimicrobial activity (complete eradication of Listeria monocytogenes and Escherichia coli).

Discussion: Antimicrobial, antioxidant and barrier properties of films used in active packaging are necessary to ensure the safety of food products and increase shelf life. The current packaging film was able to be a good packaging in terms of antioxidant and antimicrobial to prevent quality loss

due to oxidation and microbial contamination during product storage.

Keywords*:* Food packaging, Carbon dot, Food safety

*Corresponding Author: Milad Tavassoli Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran,

mtavassoli2006@gmail.com

Investigating the Factors that Affect Acrylamide Levels in Roasted Coffee, Focusing on Roasting Degree and Coffee Variety

Farzane Hosseini [1*], Seyed Jamalaldin Zakerin [2,] Javad Saadati [3]

1,3 Quality Control Departmaent, Amazing & Healthy Mediterranean Food Products Co., Shiraz, Iran

2 Food and Drug Departmaent, Shiraz University of Medical Sciences, Shiraz, Iran

Background: It is widely acknowledged that acrylamide, which is present in certain foods that have undergone heat treatment, is a significant toxic compound for humans. The coffee beverage is a major source of acrylamide, as the raw bean contains the reaction substrates and is heated to very high temperatures during roasting. Due to its high consumption worldwide, it is necessary to find applicable solutions to decrease the concentration of this unwanted Maillard reaction product.

Methods: The present paper provides a comprehensive overview of the formation of acrylamide throughout the entire coffee production process, encompassing raw materials to coffee brewing, with a particular emphasis on the roasting stage and various varieties of coffee. The formation and partial degradation of acrylamide (AA) were assessed using GC-MS during an industrial coffee roasting procedure, in which the three roasting degrees were selected, namely light, medium, and dark. The roasting of Arabica and Robusta varieties was conducted individually.

Results: The findings revealed a consistent decrease in AA levels as the degree of roasting increases. The decrease in AA concentrations is likely to be a result of the degrading of this substance during the roasting procedure.

Discussion: Furthermore, the investigation conducted on the presence of AA in two distinct coffee varieties, namely Arabica and Robusta, suggests that Arabica beans possess lower levels of AA than Robusta beans. The higher concentration of asparagine in Robusta beans may result in higher levels of AA in the finished product.

Keywords*:* Acrylamide, Robusta, Arabica, Roasting degree, GC-MS, Process Optimization

*FarzaneHosseini
Quality Control Departmaent, Amazing & Healthy Mediterranean Food Products Co., Shiraz, Iran

far.hosseini90@gmail.com

Current advancement in producing active nanofiber mats to enhance the shelf-life of perishable food products

Negin Karami*

Department of Food Hygiene, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.

Background: Perishable food products, such as seafood along with red and poultry meats, are susceptible to chemical and microbial spoilage owing to the environmental and microbial influences during production, storage, distribution, and transportation. Ultrafine polymer fibers are an alternative for the development of food packaging materials since biocompatible, nontoxic, and biodegradable polymers can be used for their production. The aim of this study was to review the current advancement in producing active nanofiber mats to enhance the shelf-life of perishable food products.

Methods: The findings of the present study were obtained after searching in Elsevier, Taylor & Francis group, and Springer publishers with keywords of nanofiber mats, electrospinning, shelf-life extension, and perishable food products.

Results: Findings of the current study showed that packaging nanofiber mats based on degradable polymers, such as chitosan, gelatin, sodium alginate, gum Arabic, pullulan, locust bean gum, and guar gum, have shown enhanced water resistance, hydrophobicity and decreased oxygen permeability, therefore incrementing the shelf-life of meat and meat products. Moreover, previous studies showed that the nanofiber mats enriched with antimicrobial and antioxidant compounds, such as plant essential oils (basil, oregano, Ziziphora clinopodioides, and Zanthoxylum bungeanum) and extracts (Lithospermum erythrorhizon, Heracleum persicum, pomegranate, red plum, turnip, and red apple), could successfully improve the shelf-life of seafood and meat products. These nanofibers could retard the growth of spoilage related microorganisms and food-borne pathogens, lipid oxidation, and protein degradation during the extended shelf-life of perishable foods.

Discussion: Packaging materials based on nanofiber mats have shown promise in improving the preservation, quality assessment, and reformulation of meat products, seafood, and poultry meat.

Keywords: Nanofiber mats, Electrospinning, Shelf-life extension

*Corresponding author: Negin Karami Department of Food Hygiene, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran

neginkarami87@gmail.com

Physical properties of nanofiber mats based on poly(vinyl alcohol) containing basil leaf extract

Negin Karami[1*], Nassim Shavisi[2]

1 Department of Food Hygiene, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.

2 Department of Food Hygiene, Faculty of Veterinary Medicine, Razi University, Kermanshah, Iran.

Background: The nanofiber materials fabricated from natural biopolymers (such as proteins, lipids, and polysaccharides) have attracted more and more attention due

to their safety and good biocompatibility. The electrospinning process is a new, versatile, cost-effective, and easy to use technique that utilized a high-voltage electric field to charge the spinning solution of polymer and ejects a liquid jet through a spinneret, leading to ultrafine nanofiber mats. The aim of the present study was to evaluate physical properties of nanofiber mats containing basil leaf extract 2% prepared by the electrospinning process.

Methods: The poly(vinyl alcohol) nanofiber mats containing basil leaf extract 2% were prepared by an electrospinning equipment, which was set as follows: distance between the collector and needle of 13 cm, a high voltage power supply of 18 kV, and a flow rate of 0.7 ml/h. Physical properties, including thickness, water solubility, and moisture content, of fabricated nanofiber mats were determined based on the standard methods.

Results: The results of the present study showed that incorporating basil leaf extract 2% into the poly(vinyl alcohol) nanofiber mats resulted in increasing thickness (0.25 mm → 0.34 mm) along with decreasing water solubility (18.32% → 7.42%) and moisture content (5.82% → 3.42%) of the corresponding polymers.

Discussion: The decrease of physical properties of nanofiber mats containing basil leaf extract 2%, including moisture content and water solubility, compared to the control group could be related to the interaction of hydrophilic extract components with hydroxyl groups of the poly(vinyl alcohol), which decreases the affinity for water of the fiber mats. Our findings indicate that the fabricated electrospun fibers with appropriate physical properties can be utilized as packaging polymers.

Keywords*:* Electrospinning, Nanofiber mats, Plant extract

*Corresponding author: Negin Karami Department of Food Hygiene, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran

neginkarami87@gmail.com

Evaluation of oxidative and microbial properties of mayochilli sauce containing Iranian Shallot Nanoemulsion

Nasrin Faraji[1*], Soheila Faraji[2], Sasan Ghanadan[3], Minoush Faraji[4]

1 Research and Development, Azin company, shoushtar,Iran

Background: One of the most often used sauces is mayochilli, which is made of vinegar, sugar, vegetable oil, egg yolk, water, and chilli granule then which is susceptible to chemical deterioration and microbial growth. some spices and herbs essential oil such as Shallots can be used as potent antimicrobial agents against foodborne pathogens, by adding the appropriate stability, antimicrobial and organoleptic properties of the essential oil nanoemulsion(NE). The study aimed to assess the antioxidant and antimicrobial effects of nanoemulsions from Iranian shallot against food-borne microorganisms. Additionally, to evaluate the microbial growth and oxidative stability of mayochilli containing the pure essential oil(PE) and Iranian shallot essential oil nanoemulsions in comparison to a control sample during storage.

Methods:

Omega3 nanoemulsions were produced utilizing Iranian shallot essence through spontaneous emulsification, by optimal design method, and subsequently, optimal formulations were determined (including 75% omega3, shelf life of 35 days, 39.263% SOR, and 80% surfactant type). These formulations were then used in the production of mayochili sauce to investigate the added nanoemulsion and shelf life. Statistical analysis was carried out by factorial experiment in a completely randomized design with three replications using minitab 21 software.

Results:

The method of microdilation of broth was used to determine (MICs) and (MBCs), ranging from the most susceptible to the most resistant strains, Bacillus cereus and Staphylococcus aureus, salmonella typhi, pseudomonas aerogenes and Escherichia coli respectively and PE showed a stronger antibacterial activity than NE.

Discussion:

The microbial test results of mayochilli sauces also showed that NE and PE respectively had a good inhibitory effect on the growth of microorganisms compared to the control, and a decrease in peroxide and thiobarbituric acid index was also observed ($p<0.05$).

Due to Iranian shallot contains specific components such as methylmethylthioethyldeoxygen ,diallyldeoxygen ,methyldeoxygen dimethyldeoxygen (2 - propane) and lemonine.

Keywords*:* Nanoemulsion, Antibacteria, Essential oil, Iraninan Shallot

nasrin.faraji88@yahoo.com

Investigating the importance of observing food hygiene and safety and its impact on human health

Presenting Author[1],: Masoumeh Mohajer Bastami

(Bachelor of Nursing), expert in Oral and Dental Health Department - Provincial Health Center - Golestan-Gorgan University of Medical Sciences

Background: Food and safety in the food industry are considered to be the most important phenomena on the life of living organisms. Food poisoning includes disorders that occur as a result of eating rotten food contaminated with microbes and chemicals in the body. There are different types, the microbial type is common. is more It is very important to pay attention to two issues: 1- receiving different nutritional factors that suit the needs of the body (macronutrients, micronutrients) 2- receiving the required food in a completely healthy form without harmful contamination and in conditions where its nutrients are prepared in different stages. Cook, preserve as much as possible. The second issue is food hygiene, which is the basic pillar of proper nutrition.

Methods: The study was conducted by a review method on the studies conducted in SID, GOOGLESCHOOLAR, PubMed scientific sites with the aim of investigating the importance of observing food hygiene

and safety and its impact on human health. The criteria for entering the information of articles related to the topic and containing research keywords has been.

Results: Human awareness of health principles and food safety issues can prevent food contamination and food poisoning, as well as many diseases that are transmitted through food, by observing health principles to maintain food safety in different stages of production. They can be prevented from preparation, preparation and storage until consumption.

Discussion: As a result, food safety is related to the health and hygiene of food, which is based on the provision of conditions and methods through which the quality of food is maintained. Therefore, all the people involved should be aware of food diseases and take appropriate measures to prevent them

Keywords: Food hygiene, poisoning, nutritional value, microbial spoilage

masoome.mohajer@yahoo.com

---

sodium thiosulfate friend or foe?

Maryam Shirani[1], Saeedeh Shariati[1,2*], [3]Fatemeh Kardani, [2]Farnush Bakhshimoghaddam

l Department of Toxicology, Faculty of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

2 Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

3 Food and Drug Administration, Ahvaz Jundishapur University of medical sciences of Ahvaz, Iran

sodium thiosulfate ($Na_2S_2O_4$) is a grayish-white crystalline powder. This sulfur-containing compound is widely used as a decolorizer in various industries (sugar, paper and textile, and regeneration of cellulose fibers). After entering the digestive system, this compound causes the destruction of stomach and intestinal villi, and in the long run, by removing antioxidants, it will cause the spread of cancer in the digestive tract. It also accelerates diabetes. Sodium thiosulfate is also used as an antidote for cyanide poisoning, but studies have shown that its effectiveness in some pathological conditions is associated with ectopic calcification. The mechanism of action is not yet clear. It has been assumed that sodium thiosulfate: (1) forms a soluble complex with calcium, (2) has antioxidant activity that improves endothelial function, (3) has acidosis properties. However, studies have shown that the inhibitory effect of sodium thiosulfate appears to be due to a direct extracellular effect on calcification caused by cell damage that releases cellular debris and matrix vesicles. However, sodium thiosulfate is used to treat calciphylaxis, kidney stones, uremic vascular calcification, and coronary artery calcification. By using intravenous sodium thiosulfate in a disease with multiple mutations in genes during a period of 6 months, calcific stenosis of celiac and mesenteric arteries was no longer detectable. Also, clinical trials show that

sodium thiosulfate treatment can be safe and can reduce the rate of progression of coronary artery calcification in hemodialysis patients. In general, to investigate the harmful effects of sodium thiosulfate, the route of exposure and its consumption amount are very important**.**

Keywords*:* sodium thiosulfate, clinical adverse effects, health benefits

Corresponding author:
*Saeedeh Shariati
Department of Toxicology, Faculty of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Saeedeh.Shariati@yahoo.com

A comprehensive study reviewing the impact of Mancozeb on health.

Saeedeh Shariati[1,2], Maryam Shirani [1*], [3]Fatemeh Kardani,

l Department of Toxicology, Faculty of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

2 Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

3 Food and Drug Administration, Ahvaz Jundishapur University of medical sciences of Ahvaz, Iran

Mancozeb, a fungicide with a successful track record spanning almost seven decades in agriculture and industry, is a commonly utilized solution for combating fungal diseases in key crops like potatoes, tomatoes, grapevines, and citrus, effectively targeting a wide range of plant pathogens. Exposure to Mancozeb for the general public primarily occurs through limited ingestion in their diet via consuming contaminated produce and water. Workers handling Mancozeb in manufacturing or agricultural settings face exposure risks through skin contact, inhalation of dust or fine spray, and accidental ingestion due to poor hygiene practices. Despite being swiftly metabolized with low acute toxicity, interaction with the fungicide poses environmental health hazards, including neurotoxic effects resembling Parkinson's disease and elevated risks for certain demographics like women and children. Prolonged exposure to Mancozeb and its metabolite, degradate ethylenethiourea (ETU), presents established threats to the endocrine system, potentially resulting in birth defects, mutations, and cancer. Recent toxicological studies highlight persistent genetic damage and early signs of cancer development in human cells following Mancozeb exposure, sparking concerns about cancer and reproductive health implications for exposed populations. Research on rodents demonstrates that both Mancozeb and ETU can breach the placental barrier, significantly endangering reproductive function, provoking DNA damage, and inciting tumor growth in fetal cells. These findings emphasize the extensive carcinogenic potential of Mancozeb with extended exposure in rats and its suspected role as an endocrine disruptor associated with thyroid disorders like hyperthyroidism and hypothyroidism. As a result, mancozeb can cause great harm to human health, so controlling and limiting

the use of this fungicide in agriculture can be important.

Keywords*:* Mancozeb, agriculture, chronic toxicity

Corresponding author:
*Maryam Shirani
Department of Toxicology, Faculty of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

mshirani86@yahoo.com

A Review on Kombucha Tea Composition, Fermentation, Beneficial Effects

Naeimeh Sheykholeslami[1], Vahed Agapouri Khomarlu[2*]

Tabriz Azad University of Medical Sciences-Iran , Shabestar Azad University-Iran

Abstract: Beverage fermentation is an ancient ritual that has been practised for millennia. It was slowly disappearing from households and communities due to the advancement of manufacturing technology and the marketing of soft drinks until the recent revival of the beverage fermentation culture due to an increase in the demand for health drinks amid the COVID-19 pandemic. Kombucha are well known fermented beverages that are renowned for their myriad of health benefits. The starter materials for making these beverages contain micro-organisms that act like microscopic factories producing beneficial nutrients that have antimicrobial and anticancer effects. The materials modulate the gut microbiota and promote positive effects on the gastrointestinal tract. Due to wide variations in the substrates and types of micro-organisms involved in the production kombucha , this paper compiles a compendium of the micro-organisms present and highlights their nutritional roles.

Keywords: kombucha, fermentation, micro-organisms, benefits, health

*****Naeimeh shykholeslami
Tabriz Azad University of Medical Sciences-Iran

Naiymeh72@yahoo.com

Investigating the shelf life of flour stored in flour factories

Saeedeh Soltan Ahmadi[1*], Narges Khodamoradi Vatan[2] Majid Aminzare[1], Hassan Hassanzadazar, Sara Nabati[1], Azadeh Nour Mohammadi[1]

1 Department of Food Safety and Hygiene, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran

2 School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Background: Flour, milled wheat, is processed into the desired particle sizes. To extend its shelf life and preserve microbial quality, processing it in dry form is necessary. Our aim of this research is to investigate the shelf life of flour stored in the warehouses of flour production factories in Zanjan.

Methods: Using the classified method, 20 flour factories in Zanjan were randomly selected. A sampling of the flour stored in the warehouses of the factories was done. The pour-plate method was used to count

mold and yeast in flour samples. A suspension of flour samples was prepared and poured into a sterile plate, and the culture medium was added and incubated for 5 days. The surface culture method was used for the total aerobic bacteria count. The samples were added to the plate-count agar culture medium. Plates were incubated at 30 °C for 72 h, and then the colonies were counted. All of the tests were conducted under completely aseptic conditions.

Results: The flour samples tested had mold and yeast and a total count of bacteria in acceptable ranges.

Discussion: According to the national standard of Iran No. 2393, the normal range of mold and yeast in flour is $\leq 5 \times 10^3$ cfu/g, and the normal range of the total count of bacteria in flour is $\leq 1 \times 10^5$ cfu/g. In our research, all tested samples, which were kept in warehouses under relatively suitable conditions, had a microbial load within the normal range. Therefore, it can be inferred that if the storage conditions are appropriate, the flour used in the preparation of bread in Iran will not undergo many changes in terms of microbial load.

Keywords*:* Flour, Shelf life, Mold, Yeast, Total count of bacteria

*Corresponding Author
Department of Food Safety and Hygiene, School of Public Health, Zanjan University of Medical Sciences, Zanjan, Iran

s.soltan6895@gmail.com

Antibacterial effect of ethanolic common sage extract against Bacillus cereus, Listeria monocytogenes, Salmonella Typhimurium, and Escherichia coli

Yasser Shahbazi*

Department of Food Hygiene, Faculty of Veterinary Medicine, Razi University, Kermanshah, Iran.

Background: Common sage belongs to the Lamiaceae family and is widely cultured in Middle East and Mediterranean areas. This plant traditionally utilized for treating of various diseases, such as seizure, ulcers, gout, rheumatism, inflammation, dizziness, tremor, paralysis, diarrhea, and hyperglycemia. This study aimed to investigate the antibacterial effect of ethanolic common sage extract against Bacillus cereus, Listeria monocytogenes, Salmonella Typhimurium, and Escherichia coli.

Methods: The antibacterial effect of ethanolic common sage extract 3% against B. cereus (ATCC 11774), L. monocytogenes (ATCC 19118), S. Typhimurium (ATCC 14028), and E. coli (ATCC 10536) was evaluated under in vitro conditions, disk diffusion agar assay. The minimum inhibitory concentration of the extract was also determined using a micro-broth dilution assay.

Results: The results of the present study showed that ethanolic common sage extract 3% had an appropriate antibacterial activity against B. cereus, L. monocytogenes, S. Typhimurium, and E. coli, having the diameters of the inhibition zone of 6.80, 8.11, 4.35, and 4.12 mm, respectively. The minimum inhibitory concentrations of the

extract against B. cereus, L. monocytogenes, S. Typhimurium, and E. coli were 0.05, 0.03, 0.09, and 0.09 mg/ml, respectively.

Discussion: The higher antibacterial activity of ethanolic common sage extract against L. monocytogenes and B. cereus compared to the S. Typhimurium and E. coli could be linked to the outer cytoplasmic membrane surrounding the thin peptidoglycan structure of gram-negative bacteria. The antimicrobial activity of plant extract might also be related to the hydroxyl groups in the anthocyanins and phenolic constituents, which can bind to the bacterial enzymes, minerals, vitamins, and also cell membrane, resulting in bacterial cell death. Our findings showed that common sage might be considered as a practical possible strong antimicrobial in food products.

Keywords*:* Common sage, Food-borne pathogens

*Corresponding author: Yasser Shahbazi Department of Food Hygiene, Faculty of Veterinary Medicine, Razi University

yasser.shahbazi@yahoo.com

Physical characteristics of poly(vinyl alcohol) nanofiber mats encapsulated with ginger essential oil

Yasser Shahbazi*

Department of Food Hygiene, Faculty of Veterinary Medicine, Razi University, Kermanshah, Iran.

Background: It has been reported that nanofibers could achieve a long-term efficiency against microbial growth on food when it was utilized as food packaging materials. Electrospinning is an electrohydrodynamic approach which a high potential electric field is utilized to a spinning feed solution to generate Taylor cones (electrically charged conical droplets), which are ultimately stretched into fibers with diameters ranging from nanometer to micrometers. The aim of this study was to evaluate physical characteristics of poly(vinyl alcohol) nanofiber mats encapsulated with ginger essential oil.

Methods: Poly(vinyl alcohol) nanofiber mats encapsulated with ginger essential oil 1% and 2% were fabricated through the electrospinning approach. The electrostatic spinning factors including voltage, flow rate, and distance between the rotating drum and the needle tip were set at 18 kV, 0.4 ml/l, and 15 cm, respectively. Physical attributes, including thickness, water solubility, and moisture content, of designated nanofiber mats were recorded based on the standard approaches.

Results: The results of this study showed that thickness, water solubility, and moisture content of nanofiber mats encapsulated with ginger essential oil 1% and 2% were remarkably lower than the straight poly(vinyl alcohol) nanofiber mats, evidenced by 0.18-0.33 mm, 5.11%-18.45%, and 2.84%-6.11%, respectively.

Discussion: The higher water barrier property of the poly(vinyl alcohol) nanofiber mats encapsulated with ginger essential oil, as main physical parameters of packaging materials, may be as a consequence of the reduction of available

OH groups of polymer and reduced affinity for water of poly(vinyl alcohol) nanofiber mats. Results of this study showed that poly(vinyl alcohol) nanofiber mats treated with ginger essential oil 1% and 2% with acceptable water barrier properties could be appropriate materials to use in the food packaging area.

Keywords: Physical attributes, Poly(vinyl alcohol), Plant essential oil

*Corresponding author: Yasser Shahbazi Department of Food Hygiene, Faculty of Veterinary Medicine, Razi University

yasser.shahbazi@yahoo.com

Antimicrobial activity of ethanolic chamomile extract against Listeria monocytogenes, Staphylococcus aureus, and Bacillus subtilis

Negin Karami[1], Nassim Shavisi[2*]

1 Department of Food Hygiene, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.

2 Department of Food Hygiene, Faculty of Veterinary Medicine, Razi University, Kermanshah, Iran.

Background: Chamomile flower is a widely cultured plant throughout the world and is extensively considered as a broad-spectrum antibacterial agent. The aim of the present study was to investigate the antimicrobial activity of ethanolic chamomile extract 2% against *Listeria monocytogenes*, *Staphylococcus aureus*, and *Bacillus subtilis*, as common food-borne pathogenic bacteria.

Methods: Bacterial suspensions (7 log CFU/ml), including *S. aureus* (ATCC 6538), *L. monocytogenes* (ATCC 19118), and *B. subtilis* (ATCC 6633), were prepared based on a standard method and then spread them on the Brain Heart Infusion agar plate using a sterile cotton swab. The 6 mm diameter discs were placed on the cultured agar plates. After pouring 10 µl ethanolic chamomile extract 2% on the diameter discs, the cultured plates were incubated at 37 ± 1 ºC for 24 h, and the diameter of the inhibition zone of the extract was determined using a caliper. The minimum inhibitory concentration of the extract was also determined using a micro-broth dilution assay.

Results: Our findings showed that the ethanolic chamomile extract 2% exhibited remarkable antibacterial impact against S. aureus, L. monocytogenes, and B. subtilis, evidenced by the inhibition zone diameter of 6.80, 7.42, and 6.85 mm, respectively. The minimum inhibitory concentrations of the extract against S. aureus, L. monocytogenes, and B. subtilis were determined to be 0.05, 0.03, and 0.03 mg/ml, respectively.

Discussion: The antimicrobial effect of ethanolic chamomile extract could be because of the existence of high levels of antimicrobial phenolic groups in the plant extract, which can penetrate the bacterial cell membrane and interfere with critical metabolic pathways. The results of the present experiment indicate a potential application of ethanolic chamomile extract as a natural antimicrobial against the

growth of food-borne pathogens, such as S. aureus, L. monocytogenes, and B. subtilis.

Keywords: Chamomile extract, Antimicrobial, Pathogens

*Corresponding author: Nassim Shavisi Department of Food Hygiene, Faculty of Veterinary Medicine, Razi University, Kermanshah, Iran

nassim.shavisi@yahoo.com

Antimicrobial activity of thymol as the main monoterpene phenol in some medicinal plants

Nassim Shavisi*

Department of Food Hygiene, Faculty of Veterinary Medicine, Razi University, Kermanshah, Iran.

Background: Thymol (2-isopropyl-5-methylphenol) is the main monoterpene phenol occurring in essential oils isolated from plants belonging to the Lamiaceae family
(Thymus, Ocimum, Origanum, and Monar da genera), and other plants such as those belonging to the Verbenaceae, Scrophulariaceae, Ranunculaceae, and Apiaceae families. The aim of this study was to review the antimicrobial activity of thymol as the main monoterpene phenol in some medicinal plants.

Methods: The findings of the present study were obtained after searching in Elsevier, Taylor & Francis group, and Springer publishers with keywords of antibacterial activity, antifungal activity, thymol, and medicinal plants.

Results: Plant essential oils have been considered as generally recognized as safe (GRAS) in the Code of Federal Regulations. The essential oils are commercially important-destined chiefly for flavoring ingredients in meat and meat products, drink, and other food products as well as pharmaceutical industries, cosmetics, perfumes, and other home care products. Thymol has been shown to possess a wide range of biological activities, including antimicrobial, antioxidant, anti-infalmmatory, modulating of immunity respond, and anticarcinogenic properties. It has been indicated that essential oil obtained from Thymus, Ocimum, Origanum, and Monarda genera (with 67% thymol) had high antimicrobial activity against Escherichia coli, Streptococcus pneumoniae, Bacillus cereus, Clostridium perfringens, Candida albicans, Candida krusei, Acinetobacter lwoffii, and Klebsiella pneumoniae, respectively. It cause damage to the Listeria monocytogenes cell membrane and reduce in ATP, ATPase (Na^+K^+-ATPase and Ca^{2+}-ATPase) activity and respiratory chain complex activity.

Discussion: Thymol is an interesting substance due to its different properties and potential applications in varied fields. The results obtained by the large number of investigations performed over the last decade prompted the use of thymol and thymol-rich essential oils in the food and cosmetic industries.

Keywords: Antibacterial activity, Antifungal activity, Medicinal plants

*Corresponding author: Nassim Shavisi Department of Food Hygiene, Faculty of Veterinary Medicine, Razi University, Kermanshah, Iran

nassim.shavisi@yahoo.com

Evaluation of Food Authenticity, Quality, and Adulteration by NMR Analysis

Setayesh Zamanpour[1], Mohammad Hashemi[1, 2,*]

1 Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

2 Medical Toxicology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Nuclear Magnetic Resonance (NMR) methods can be mentioned among the new methods for determining the authenticity, quality, and detection of adulteration in food. The purpose of this study is a comprehensive review of the application of the NMR method in determining the authenticity, quality, and detection of adulteration in different food products. In this study, the advantages and disadvantages of the NMR method are discussed and the findings of recent articles for this technique in the field of authenticity measurement and determination of food quality are discussed.

Methods: To find relevant studies, the keywords "NMR" OR "NMR database" AND "Food fraud" OR "Food authenticity" OR "Food quality" were searched on Web of Science, Google Scholar, PubMed, and Scopus until 2023.

Results: Today, NMR is considered an important and powerful tool for detecting the adulteration of food and provides the possibility of simultaneous evaluation of the authenticity and quality of food. NMR techniques have played an important role in the authentication of some foods such as tomato paste, saffron, honey, coffee, and balsamic vinegar, fraud detection, and quality assurance.

Discussion: NMR has very important advantages such as no need for preliminary information about the compounds in the sample, minimal preparation, and fast, simultaneous, advanced, and non-destructive analysis. However, it has disadvantages, like the high costs of acquisition and maintenance. Eventually, it is expected that NMR will solve some problems for the benefit of consumers.

Keywords*:* NMR, Food fraud, Food authenticity, Food quality, NMR database

*Corresponding Author Mohammad Hashemi

Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran Medical Toxicology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

mo_hashemi@hotmail.com

Novel Methods for Detecting Fraud in Meat and Meat Products

Mohammad Hashemi[1, 2,*], Setayesh Zamanpour[1]

1 Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

2 Medical Toxicology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Considering the relatively high cost of raw meat, the possibility of fraud in meat food products is not out of mind. The importance of understanding fraud in meat products is in terms of mixing other types of meat or cheap carcass components or not complying with the ingredients mentioned on the product label. Detecting fraud in meat products is important from various aspects such as economics, security, religious, health, and disease, so the institutions that monitor the quality and health in society should address this issue with different, modern, and precise methods. This article comprehensively examines recent developments in the field of new methods used to identify fraud in meat and meat products.

Methods: To find relevant studies, the keywords "Novel methods" AND "Fraud" OR "Authenticity" AND "Meat" OR "Meat products" were searched on Web of Science, Google Scholar, PubMed, and Scopus until 2023.

Results: Using a combination of chemical and molecular analysis methods, DNA analysis, microbial component analysis and isotope analysis, biosensor analysis, near-infrared spectroscopy (NIR), Raman spectroscopy, new technologies such as artificial intelligence and blockchain, and tracking technologies such as Internet of Things fraud in the meat industry can be detected and significantly improved in consumer and meat industry confidence.

Discussion: Food adulteration is a widespread concern for all food consumers. Fortunately, strategies to detect food fraud are developing. With continued research and technological advancements, we hope that more effective methods will be developed to detect food fraud.

Keywords: Novel methods, Fraud, Authenticity, Meat, Meat product

Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran Medical Toxicology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

mo_hashemi@hotmail.com

Examining the effect of macadamia nuts on body fat mass; A systematic review

Neda Toghra[1], Shahrzad Ataee[2*]

1- Nutrition expert, technical and quality control officer of health and drinking industries Navid Anahita of Ahwaz, Ahwaz, Iran

2- Student Research and Technology Committee, Behbahan Faculty of Medical Sciences, Behbahan, Iran

Introduction: A relatively high percentage of women and men in Iran face the problem of high blood cholesterol levels or hypercholesterolemia. A disorder that

increases the risk of atherosclerotic cardiovascular events. Considering the side effects of existing chemical and pharmaceutical treatments, the impact of nutrition science on this disorder was considered, and in this study, the effect of macadamia nuts on blood cholesterol was investigated.

Methodology: This review study was investigated by searching Pubmed-Scopus-WOS-SID databases and Google scholar search engine with the keywords macadamia, cholesterol, blood, hazelnut during the years 2015 to 2022.

Results: Examining the results of various studies showed that the consumption of macadamia nuts reduced the percentage of body fat without significant changes in body weight or BMI. In fact, daily consumption of macadamia nuts does not lead to weight or body fat gain in free-living conditions in overweight or obese adults. Also, from the results of a group of clinical trial studies, reduction of total cholesterol, LDL cholesterol, ApoB and triglyceride was obtained.

Discussion: Considering the direct effect of macadamia nuts and other tree nuts on reducing blood cholesterol levels, it is recommended to provide necessary training on the use of these nuts in the diet as a preventive and auxiliary treatment factor.

Keywords: macadamia, cholesterol, blood, hazelnut.

Corresponding author: Shahrzad Ataee

ataieshery10@gmail.com

Investigating the effect of pumpkin seed oil on men's prostate disorders; A systematic review

Shahrzad Ataee[1*], Neda Toghra[2], Alireza Rafi[3]

1- Student Research and Technology Committee, Behbahan Faculty of Medical Sciences, Behbahan, Iran

2- Nutrition expert, technical and quality control officer of health and drinking industries Navid Anahita of Ahwaz, Ahwaz, Iran

3- M.Sc of Geriatric Nursing, Nursing Department Instructor, , Behbahan Faculty of Medical Sciences, Behbahan, Iran

Introduction: Most men of a certain age are affected by symptomatic benign prostatic hyperplasia (BPH) due to the side effects of chemical drugs. Herbal medicine has been identified as a common treatment for BPH. In this study, the effect of pumpkin seed oil on men's prostate disorders was investigated.

Methodology: This review was conducted by searching Pubmed-Scopus-WOS-SID databases and Google scholar search engine with keywords oil, pumpkin seed, disorders, prostate, men during the years 2014 to 2023.

Results: Different studies showed that the use of pumpkin seed oil significantly reduced IPSS (prostate symptoms) and PVR (residual urine volume), and the use of

this oil significantly reduced nocturnal enuresis and improved sleep continuity and increased quality of life in BPH patients. Also, in some studies, it was found that the use of pumpkin seed oil, compared to alpha blockers such as tamsulosin, which are used for the treatment and control of BPH, causes fewer side effects and is equally effective.

Discussion: Considering the effect of pumpkin seed oil on PBH, it is recommended to conduct more extensive research, as well as the necessary training and information regarding the correct use of this substance as a complementary treatment.

Keywords: macadamia, cholesterol, blood, hazelnut.

Corresponding author: Shahrzad Ataee

ataieshery10@gmail.com

Examining the effect of barberry on the disease of COVID-19; A systematic review

Shahrzad Ataee[1*], Neda Toghra[2], Alireza Rafi[3]

1- Student Research and Technology Committee, Behbahan Faculty of Medical Sciences, Behbahan, Iran

2- Nutrition expert, technical and quality control officer of health and drinking industries Navid Anahita of Ahwaz, Ahwaz, Iran

3- M.Sc of Geriatric Nursing, Nursing Department Instructor, , Behbahan Faculty of Medical Sciences, Behbahan, Iran

Introduction: In addition to lung tissue, the disease of COVID-19 invades other tissues as well. Due to the spread of Corona in recent years, finding effective natural compounds to fight against this virus was considered. In this study, the effect of barberry on the disease of COVID-19 was investigated.

Methodology: This review was conducted by searching Pubmed-Scopus-WOS-SID databases and Google scholar search engine with the keywords Berberian, Corona, Covid-19, Barberry during the years 2019 to 2022.

Results: Various studies have shown that BBR, which is found in some plants such as barberry and turmeric, has anti-inflammatory, antioxidant, antiviral and immune system regulating effects. By having anti-SARS-CoV-2 effects, BBR is associated with the reduction of inflammatory changes and prevents the replication of SARS-CoV-2. Recent evidence has shown that SARS-CoV-2 may cause direct damage to the pancreas, causing the onset of diabetes in non-diabetic individuals; BBR prevents diabetes in the face of COVID-19.

Discussion: According to the evidence obtained about the effect of BBR on COVID-19, it is recommended to use BBR as a complementary treatment and to include the consumption of this substance through barberry in the diet plan.

Keywords: Berberian, Corona, Covid-19, Barberry.

Corresponding author: Shahrzad Ataee

ataieshery10@gmail.com

A brief overview of the trends and applications of intelligent packaging in dairy products

Neshat Ahmadi[1], Reza Abedi-Firouzjah[2], **Shamima Azimi Salim** [3*]

1-Ph.D. student, food science and industry, Islamic Azad University, Tabriz

2- Ph.D. student, Food Health and Safety, Faculty of Nutrition and Food Industries, Kermanshah University of Medical Sciences

3- Employee, Food and Drug Organization, Hamadan University of Medical Sciences

Background: Dairy products contain high amounts of nutrients that help the growth and proliferation of spoilage and disease-causing microorganisms and consequently put them at high risk in terms of quality loss and food safety. It has been proven that packaging can protect products containing air after production and can increase the shelf life of these products.

Methods: In this research, articles related to the subject of the study were searched in databases, ISI Web of Knowledge, PubMed/Medline Scopus, and Google Scholar, and related studies were collected from 2012 to 2023.

Results: This new packaging technology has great commercial potential for reducing food loss, food poisoning, and allergic reactions. Since this packaging can monitor temperature changes, microbial spoilage, package integrity, physical shock, and the freshness of the packed products it provides the opportunity for consumers to conduct in-house quality control.

Discussion: Among all types of packaging, intelligent packaging can be used as an effective method to preserve dairy products and inform users about the entire background of the products. For the development of intelligent packaging in dairy products, it is necessary to investigate and optimize indicators (temperature-time indicators, freshness indicators, gas, integrity, and freshness), data carriers (RFID, barcode), and sensors.

Keywords*:* Dairy products, intelligent packaging, sensors, temperature-time indicators, freshness indicators

*Corresponding Author: Shamima Azimi Salim
Affiliation: Employee, Food and Drug Organization, Hamadan University of Medical Sciences

azimisalim1995@yahoo.com

A review of graphene-based nanomaterials for the removal/adsorption of antibiotics and drugs from aqueous environments

Shamima Azimi Salim[1], Reza Abedi-Firouzjah[2], **Neshat Ahmadi**[3*]

1- Employee, Food and Drug Organization, Hamadan University of Medical Sciences

2- Ph.D. student, Food Health and Safety, Faculty of Nutrition and Food Industries, Kermanshah University of Medical Sciences

3- Ph.D. student, food science and industry, Islamic Azad University, Tabriz

Background: Antibiotics are a class of drugs used to treat bacterial infections by killing or slowing the growth of bacteria. Therefore, removing or reducing antibiotics from aquatic environments and even food is vital. Graphene, an interesting one-atom-thick, 2D single-layer carbon sheet with sp^2 hybridized carbon atoms, has become an important agent for removing antibiotics, owing to its unique physiochemical properties.

Methods: In this research, articles related to the subject of the study were searched in databases, ISI Web of Knowledge, PubMed/Medline Scopus, and Google Scholar, and related studies were collected from 2012 to 2023.

Results: In general, our findings showed that graphene-based nanomaterials have a high potential for absorbing and removing antibiotic compounds, but in order to achieve maximum efficiency, various parameters need to be optimized.

Discussion: Based on the findings, pure graphene, graphene oxide, and reduced graphene oxide show moderate performance in removing antibiotics and pharmaceuticals. Indeed the different chemical structures and functional groups lead to their difference in the absorption capacity of antibiotics. In addition, graphene-based nanomaterials have attracted much attention for nanofiltration separation membranes in water desalination and purification, wastewater treatment, dialysis, and gas separation due to their unique layered structure and excellent physicochemical properties.

Keywords*:* Antibiotics, Absorption process, Graphene-based nanomaterials, Pharmaceuticals, Aqueous environment

*Corresponding Author: Neshat Ahmadi Affiliation and Email Address: Ph.D. student, food science and industry, Islamic Azad University, Tabriz Neshatahmadi@yahoo.com

---

Zinc Doped grapefruit peel Carbon-Dot Embedded polyvinyl alcohol/Chitsan-nanofiberous films for active packaging applications

Shamimeh Azimi Salim[1], Neshat Ahmadi[2], Mohammad Ranjbari[3], **Reza Abedi-Firoozjah[1] ***

1. Employee, Food and Drug Organization, Hamedan University of Medical Sciences, Iran

2. Department of Food Science and Technology, Islamic Azad University of Tabriz, Iran

3. Department of Food Science and Technology, National Nutrition and Food Technology Research Institute, Faculty of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran,

Background: Active packaging systems play a crucial role in extending the shelf life of perishable food products. This study focuses on the development of innovative active packaging mats using zinc-doped carbon dots embedded in polyvinyl alcohol/Chitosan-nanofiber composite materials. These mats are designed to enhance the preservation and quality of fresh shrimp by providing antimicrobial and antioxidant properties.

Methods: Active composite films based Ponpolyvinyl alcohol/Chitosan-nanofiberous films containing carbon dots doped with zinc oxide/grapefruit peel were made by electrospinning method, and then the microstructural mechanical, antimicrobial, antioxidant and barrier properties were investigated.

Results: The inclusion of zinc-doped grapefruit peel CDs in PVA/chitosan nanofibrous films significantly improved their mechanical robustness, rendering them suitable for packaging applications in the seafood industry. The films exhibited enhanced physical properties, such as flexibility and barrier properties, crucial for preserving the freshness and quality of shrimp. Additionally, the microstructural analysis revealed a uniform distribution of nanoparticles, contributing to improved film performance. The film also exhibited significant antibacterial activity against the foodborne pathogens *L. monocytogenes* and E. coli, completely eradicating the growth of these bacteria within 11 h of exposure. The antioxidant properties of the films were demonstrated to effectively inhibit oxidative deterioration, thereby extending the shelf life of packaged shrimp.

Discussion: The comprehensive evaluation of mechanical, physical, microstructural, antioxidant, and antibacterial properties showcases the efficacy of these films in maintaining shrimp quality and safety during storage and transportation. This innovative packaging technology holds great potential to revolutionize the seafood packaging sector by offering improved preservation capabilities and reducing food waste.

Keywords*:* Electrospinning, Active Food packaging, Grapefruit Peel Carbon dot, Zinc doped CDs, nanofibrous films, Ponpolyvinyl Alcohol/, Chitosan, Shrimp

*Corresponding Author: Reza AbediFiroozjah Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran

r.abedi1878@gmail.com

Application of genetic engineering and gene expression in food industry

Mahya Soltani*

Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran

Abstract: DNA, RNA, or proteins in genetically modified food have been manipulated through intentional human intervention. The consumption of genetically modified food is common in certain countries. However, there are significant variations worldwide in terms of individual preferences, government policies, and institutional perspectives on the desirability of producing and consuming such food. In general, researchers have a much more positive view of genetically engineered foods than the general public does. Among other cases of effective use of genetics in the food industry, we can mention the expression of

probiotic or pathogenic genes under the influence of environmental conditions and nutrients required for growth. Therefore, the purpose of this article is to provide a general perspective on the application of genetic engineering and gene expression in the food industry.

Keywords: Genetic engineering, gene expression, food industry

mahyasoltani7113@gmail.com

Reduction of aflatoxin M_1 concentration in milk using of laccase enzyme immobilized on magnetic MoS_2/Chitosan nanocomposite

Alieh Rezagholizade-shirvan [1], Samira Shokri [2], Yeganeh Mazaheri[2], Kamiar mahmoudifar[3], Ehsan Shamloo*[1]

1 Department of Food Science and Technology, Neyshabur University of Medical Sciences, Neyshabur, Iran.

2 Department of Environmental Health Engineering, Food Safety Division, School of Public Health, Tehran University of Medical Sciences and Health Services, Tehran, Iran.

3 Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

Background: Aflatoxins, are produced by fungi. The transfer of aflatoxin from the diet to cow's milk, in the form of Aflatoxin M_1(AFM_1), poses a significant risk to human health. Therefore, it is crucial to implement effective approaches for aflatoxin decontamination in milk. Various methods are available for eliminating AFM_1 from milk. Among them, the adsorption method shows promise as a cost-effective and environmentally friendly option. Recently, nanocomposites have gained attention as a potential solution for AFM_1 removal**.**

Methods: This study aimed to find the impact of the integration of laccase enzyme (Lac) onto magnetized chitosan (Cs) nanoparticles composed of molybdenum disulfide (MoS_2 NPs) on the reduction of AFM1 concentration in milk. The evaluation of the efficacy of the laccase enzyme affixed to the nanoparticle substrate, along with the nanoparticle and the free laccase enzyme in milk with high levels of aflatoxin, was conducted utilizing HPLC.

Results: The results revealed that the excellent immobilization of laccase with 96.8% activity recovery and 2 mg/ml laccase loading capacity. The highest reduction level of AFM_1 (68.5%) was obtained by immobilizing laccase enzyme in nanocomposite at a contact time of 60 minutes. As result, Fe_3O_4/MoS_2/Cs/Lac NPs potentially can contribute to the field of materials science.

Discussion: These outcomes are in line with the findings of the studies that reported that laccase enzyme stabilization on nanoparticles increases its stability and improves its performance in detoxification. It should be noted that the amount of aflatoxin absorption by enzyme-nanocomposites is higher than free enzyme.

Other researchers have also stated similar findings

Keywords: Aflatoxin M_1; Chitosan; Molybdenum disulfide; Milk sample; laccase enzyme; Nanocomposite

* Ehsan Shamloo, Department of Food Science and Technology, Neyshabur University of Medical Sciences, Neyshabur, Iran

e.shamloo@yahoo.com

Effects of fennel or fennel seeds on non-alcoholic fatty liver disease:A systematic review

Ayda Zahednia[1], Mohammad javad Pouryousefi dezfuli[2], Pouya Bamneshin[3]

1. Student Research Committee[1], Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

2. Student Research Committee[2], Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

3. Student Research Committee[3], Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Background: Non-alcoholic fatty liver disease (NAFLD) is a type of fatty liver that occurs as a result of fat accumulation in the liver for a reason other than excessive alcohol consumption. The hypoglycemic, anti-inflammatory and antioxidant activities of fennel have been recorded in numerous studies.This study was conducted with the aim of evaluating the protective effects of fennel or its active component transanthol (TA) on non-alcoholic fatty liver disease.

Methods: This study was conducted in 2024 with an advanced search in reliable databases including Web of Science, Pubmed, Scopus and Google Scholar search engine. The reviewed articles are from 2014 to 2024. Among the 20 articles reviewed in three stages by reading the title, abstract, and then reading the full text based on the Prism guidelines according to the inclusion and exclusion criteria (studies conducted on humans and animals, the language of the articles in English, without restrictions on access to the full text and the type of study). 5 studies were included in the research.

Results: Fennel and TA both decrease blood glucose levels, decrease liver enzyme activity, food and water consumption, and severity of weight loss, decrease triglyceride (TG), total cholesterol (TC), and low-density lipoprotein cholesterol (LDL-c). and also increased high-density lipoprotein cholesterol (HDL-c).

Discussion: The results show that fennel seed extract and its active compound TA can play a role in improving the symptoms of non-alcoholic fatty liver disease through different mechanisms, including antioxidant and anti-inflammatory effects. However, to determine the definitive effectiveness, more studies with a longer duration are needed.

Keywords: Anethole,Fennel,NAFLD,Trans-Anethole

*Corresponding Author: Ayda Zahednia Affiliation and Email Address: Student Research Committee, Ahvaz Jundishapur

University of Medical Sciences, Ahvaz, Iran

aydazahed80@gmail.com

"Evaluation of its nutrition and its effect on tooth decay"

Mitra Porhashmi

(dentist) expert, director of the Oral and Dental Health Department - Provincial Health Center - Golestan-Gorgan University of Medical Sciences

Background: Tooth decay is the most common chronic disease in childhood and occurs when plaque in the mouth comes into contact with sugar and the formed acid attacks the teeth. Foods containing any type of sugar can contribute to tooth decay. Therefore, to control the amount of sugar consumed, read the nutritional information and ingredient labels on food and drinks and choose the options that have the lowest amount of sugar.

Methods: The study was based on a review of the studies conducted on SID, GOOGLESCHOOLAR,PubMed scientific websites with the aim of investigating the effect of nutrition on dental caries.

Results: The bacteria in the mouth metabolize the sugars and this leads to the formation of acid and eventually by softening the tooth enamel or dentin. The decay process begins. Acids can be internal or external. Internal acids are caused by vomiting and regurgitation of blood. But external acids are obtained from diet, for example, acids that are found in fruits and fruit juices, soft drinks, some herbal teas, or foods containing vinegar.

Discussion: In order to prevent dental caries, the following solutions are effective: Limiting the consumption of foods containing sugar and sugar and sugary gums

• Children's snacks can include: homemade sandwiches, fresh fruits, vegetables and nuts.

• Vitamin C is essential for the health of gum tissues.

Keywords: Tooth decay, sugars, food acids

Corresponding author: Mitra Porhashmi

mitrapoorhashemi@yahoo.com

Investigating the use of baking soda in Hamedan's breads in 2023

Abbas Ali Sari[1*], Zeinab Bigdeli[2]

1- Associate Professor, Department of food hygiene and quality control, Faculty of veterinary medicine, Bu-Ali Sina University, Hamedan, Iran, Email: sari@basu.ac.ir.

2- BSc student, Department of food hygiene and quality control, Faculty of veterinary medicine, Bu-Ali Sina University, Hamedan, Iran.

Background: Bread as a valuable nutrient in the household food basket is of great importance and its consumption in Iran is high for economic reasons. Therefore, continuous investigation of its quality is of

great importance. Sodium bicarbonate (baking soda) is used in the formulation of some carbonated beverages and sweets and its use in bakeries is prohibited. Unfortunately, some bakeries use it to cover the poor quality of flour and accelerate the preparation of bread dough. The present study was conducted to investigate the use of baking soda in Hamadan breads in 2023.

Methods: In this study, 15 bread samples including Sangak, Lavash and baguette breads were randomly collected from Hamedan city and evaluated according to Iranian National Standard No. 2628. The results showed that one sample of Sangak bread (20%) contained baking soda and the samples of lavash bread and baguette bread had no baking soda.

Results: The results showed that one sample of Sangak bread (20%) contained baking soda and the samples of lavash bread and baguette bread had no baking soda.

Discussion: This study shows that continuous monitoring of bakeries operations and performing random sampling, can be effective in preventing any fraud.

Keywords*:* Bread, Sodium bicarbonate, Sangak, Lavash, Baguette.

*Corresponding Author: Abbas Ali Sari Associate Professor, Department of food hygiene and quality control, Faculty of veterinary medicine, Bu-Ali Sina University, Hamedan, Iran

sari@basu.ac.ir.

Increasing shelf life of pistachio with proper packaging

Nafise baradaran[1]

1 MSc graduate student in food science and technology, Department of food science and technology, Faculty of Agriculture, Ferdowsi university, mashhad, Iran

ABSTRACT: Pistachio is an export product. The decrease in Iran's share of pistachio exports shows the need for more management. The role of packaging is very effective in maintaining the quality and increasing the shelf life of food. New packaging techniques have been greatly developed during the past decades, and these techniques maintain the quality by extending the shelf life of the product. In this article, the effect of new food packaging techniques such as modified atmosphere and active packaging, as well as the effect of the type of packaging material such as metal cans and different polymer coatings on pistachio will be investigated.

Keywords*:* Pistachio, New packaging techniques, modified atmosphere, active packaging

Corresponding Author
Nafise baradaran
MSc graduate student in food science and technology

nfsbaradaran@gmail.com

Investigating the role of Internet of Things in improving the management of quality control and food hygiene

Seyed Alireza Banihashemi [*1], Sina Shafiei [2,] Komeil Amini [3], Rasool Naebi [3], Bagher Khandani [4]

1. Restaurant and Nutrition Office, Urmia University, Urmia, Iran

2. Department of Food Science and Industry, Urmia University, Urmia, Iran

3. Food and Drug Laboratory, Qom University of Medical Sciences, Qom, Iran

4. Student and Cultural Vice-Chancellor, Urmia University, Urmia, Iran

Background: Food hygiene control includes a set of procedures and classified inspections that must be implemented at every stage of the chain of production, processing, storage and distribution of food in order to prevent quality loss, economic loss and especially health damage. The increasing development of information and communication technology has led to the emergence of new and more efficient solutions in this field.

Methods: This article evaluates the use of Internet of Things in health and food quality control by reviewing English articles published in reputable scientific journals over the past 15 years. The Internet of Things in food is a new topic and the first article in this field was published in 2011, and since then 40 articles have been published, mostly related to Chinese universities.

Results: The results of this study indicate the positive impact of the Internet of Things in improving the efficiency of food supply chain management in the food industry. The Internet of Things, using the advantages of Internet technology such as high speed, remote control, and communication between several devices, can identify problems in the food supply chain faster and make more appropriate and comprehensive decisions.

Discussion: Currently, food supply chain management is being done manually, which reduces efficiency, speed, and data collection. The Internet of Things, using the integration of various technologies such as Bluetooth, infrared, Wi-Fi, networking, etc., can lead to the improvement of food quality and hygiene management from production to distribution.

Keywords*:* Internet of things, Food supply chain, Smart devices, Sensors

*Seyed Alireza Banihashemi
Msc in Food Science and Technology, Restaurant and Nutrition Office, Student and Cultural Vice-Chancellor, Urmia University

Alirezabh1992@gmail.com

Application of artificial intelligence in food industry

Seyed Alireza Banihashemi[1*], Ramin Razmi[1], Ali Jahanbakhsh[2], Sina Shafiei[2], Saber Amiri [2]

1. Restaurant and Nutrition Office, Urmia University, Urmia, Iran

2. Department of Food Science and Industry, Urmia University, Urmia, Iran

Background: Due to the rapid increase in world population, the need to ensure food security is felt more than ever and in this regard, the use of new technologies is inevitable. One of the technologies that has widely affected various industries in recent years is artificial intelligence technology.By imitating human thought processes along with the ability to learn and store data, artificial intelligence will have a very high potential for application in decision-making and process evaluation.

Methods: For years, artificial intelligence has been used and developed in various industries, including the food industry. However, due to the fact that in recent years, there have been more extensive developments and advances in the application of artificial intelligence in the food industry compared to previous years, the purpose of this article is to review the articles published from 2020 onwards.

Results: Fuzzy logic, machine learning and adaptive fuzzy neural system are among the popular techniques used in this field. Artificial intelligence has improved the processes in the food industry by using 4 general methods, which include 1- sorting raw materials, 2- observing safety and reducing pollution, 3- reducing waste and environmental problems, and 4- guiding consumers in choosing It becomes conscious.

Discussion: Artificial intelligence has well created the path of movement from traditional approaches to innovative and automatic processes, and along with machine learning, it has provided the control of criteria such as quality, appearance and customer-friendliness using multi-faceted evaluation.

Keywords*:* Artificial Intelligence (AI), Machine Learning (ML), Neural networks

*Seyed Alireza Banihashemi Msc in Food Science and Technology, Restaurant and Nutrition Office, Student and Cultural Vice-Chancellor, Urmia Universit

Alirezabh1992@gmail.com

Risk Communication Necessity in Foodborne Pathogens' Outbreak

Sousan Khodadad Hosseini[1], Fatemeh Esfarjani[2], Azadeh Rashidimehr[3], Pegah Jalalvand[4] and Soheyl Eskandari[5,6*]

1 Nutritional Sciences Student, Student Research Committee, National Nutrition and Food Technology Research Institute (NNFTRI), Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences (SBMU), Tehran, Iran

[2] Assistant Professor, Food and Nutrition Policy and Planning Research Department, National Nutrition and Food Technology Research Institute (NNFTRI), Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences (SBMU), Tehran, Iran

[3] Department of Microbiology and Food Hygiene, Faculty of Veterinary Medicine, Lorestan University, Khorramabad, Iran

[4] Quality Control Manager, Baya Catering, Kaveh Industrial Zone, Tehran, Iran

[5] Associate Professor, Food and Drug Laboratory Research Center (FDLRC), Food and Drug Administration (IR-FDA), Ministry of Health and Medical Education (MOH+ME), Tehran, Iran,

[6] Associate Professor, Food Science Department, School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences (TUMS), Tehran, Iran

Background: Recent food-borne disease outbreaks and/or large food recalls have had adverse impacts on consumer confidence in the safety of the food supply. Post-event analysis of such events has indicated the importance of more effective use of risk communication that is defined as the exchange of information and opinions concerning risk and risk-related factors among risk assessors, risk managers, consumers and other interested parties.

Methods: Shared goals of the public and private sectors are to prevent as many outbreaks as possible and to mitigate those that do occur. Improvements in laboratory and communication technologies have enabled agencies to link cases that previously were thought to be sporadic and to identify and address implicated foods and sources. The involved agency's response plan should include its likely role in a foodborne illness outbreak investigation, staff (or positions) that may be involved, contact information for relevant external agencies, and communication and escalation procedures for working with those agencies.

Results: Agencies responsible for controlling foodborne illness outbreaks should establish relationships and communication pathways with law enforcement agencies before any outbreak. The success of a public agency's efforts to combat foodborne illness also greatly depends on its cooperation and communication with multiple parties in the food, agriculture, healthcare, and laboratory sectors. Ultimately, the goal is to become more effective at protecting public health and preventing disease by leveraging legal authorities.

Discussion: Even though reporting, surveillance, and mitigation of foodborne disease outbreaks is established to some extent in food law, issues continue to arise that demonstrate differences in MoH's law with other regulatory authorities' law. Such issues further demonstrate the ongoing need for communication and collaboration among all officials who are united in the common goal of protecting the public's health.

Keywords*:* Food Safety, Risk Analysis, FSMS, Public Health, Food Law

*Corresponding Author: Dr. Soheyl Eskandari

Affiliation and Email Address:

a Associate Professor, Food and Drug Laboratory Research Center (FDLRC), Food and Drug Administration (IR-FDA),

Ministry of Health and Medical Education

b Associate Professor, Food Science Department, School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences (TUMS), Tehran, Iran

so.eskandari@sbmu.ac.ir

Concentration of Toxic Trace Elements in Baby food and Health Risk Assessment

Seyedeh Belin Tavakoli Sani[1], Shiva Rahati[2], Asma Afshari3, Mohammad Hashemi[3] ,

1. Department of Health, Safety, Environment management, School of Health Mashhad University of Medical Sciences, Mashhad, Iran

2. Department of Food Sciences and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz,Iran

3. Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Excessive exposure to toxic trace elements contamination through ingestion of baby foods may cause carcinogenic and other non-carcinogenic adverse effects. Taking note of this concern, we aim to evaluate probable carcinogenic and non-carcinogenic risks associated with the presence of trace elements through ingestion of baby food.

Methods: A total of 72 baby food samples from 6 commercial brands have been collected from June 2020 to June 2021 from the Iran Market. The potential lifetime health risk posed to infants and toddlers is measured based on daily intake of elements, non-cancer hazard indices (HIs), hazard quotient (HQ), and lifetime cancer risks (Cr).

Results: The average concentrations of arsenic, aluminum, cadmium, cobalt, chromium, copper, iron, and zinc in the baby food significantly ($P<0.05$) exceeded the FAO/WHO standards in all seasons. All estimated values for HI were higher than the level of concern (HI > 1) for all age groups, and the HQ of arsenic through ingestion of baby food contributed the highest portion of HI total elements (71.3%). The chance of developing CR through exposure to baby food ranged from $3.30 \times 10{-}3$ to $6 \times 10{-}3$.

Discussion: Overall, the HI and CR through exposure to baby food were higher than the safety level of US EPA risk, indicating the possibility of non-cancer and cancer risk for the children. Therefore, authoritative action limits should be set for baby food manufacturers to evaluate both their finished products for toxic trace elements and phase out products that have high toxic trace elements and arsenic concentrations.

Keywords*:* Heavy metals, baby food, Health risk, Carcinogenic risk, food safety

*Corresponding author: Seyedeh Belin Tavakoli Sani, Department of Health, Safety, Environment management, School of Health Mashhad University of Medical Sciences, Mashhad, Iran

tavakkolisanib@mums.ac.ir.

A Review on Safety of Alternative Proteins

Nasim Jafari Tabrizi[1], Milad Tavassoli[1*], Sadaf Mohajjel Sadeghi[1], Sahar Majnouni Algoo[1]

1 Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background: The pressing global challenges of food security and environmental sustainability require transformative solutions. As traditional livestock production proves unsustainable, the search for alternative protein sources becomes urgent. This includes cultured meat, plant-based meat, insect protein, and single-cell protein (SCP). This review examines the food safety considerations linked to these innovative protein sources, covering their technology, environmental impact, and necessary regulatory framework for widespread production.

Methods: Three databases (ISI Web of Science, Google Scholar, Scopus) were searched using specific keywords ('alternative proteins,' 'cultured meat,' 'plant-based meat,' 'novel food,' 'environmental issues,' 'food safety'). Over 3,000 papers were found, with four meeting the criteria for inclusion in the review study and were assessed.

Results: Cultured meat, utilizing fetal bovine serum-based media, poses risks from viruses, infectious prions, and genetic engineering. Plant-based meat may contain allergens, anti-nutrients, and carcinogens induced by thermal processing. Insect protein raises concerns about microbiological risks and allergens. Single-cell protein sources, like microalgae and fungi, carry safety risks such as toxins, allergens, and high RNA contents. Environmental impacts focus on substrate production and cultivation. Regulatory frameworks, like novel food or genetic modification legislation, are vital for ensuring alternative protein safety.

Discussion: The growing popularity of protein alternatives raises concerns about food allergens. Plant-based alternatives may contain processing contaminants and anti-nutritional compounds, affecting nutrient absorption. While risks in insects and seaweed are being addressed, attention is needed for alternatives like cultured meat and SCPs. Our research aids industry and authorities in understanding trends and prioritizing monitoring of hazards.

Keywords*:* alternative proteins, cultured meat, plant-based meat, novel food, environmental issues, food safety

* Milad Tavassoli Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

mtavassoli2006@gmail.com.

The impact of the poultry industry in the development of food security in Iran

Seyedeh Alemeh Hosseinian

Assistant Professor of Avian Diseases Research Center, Department of Clinical Sciences, School of Veterinary Medicine, Shiraz University, Shiraz, Iran

Food security means the physical and economic access of people to food for a healthy and active life. The four pillars of food security are availability, access, utilization, and stability. Veterinary medicine is one of the major chains in the food security through the livestock and poultry industries. The poultry industry has a higher global development rate compared to the livestock for a number of reasons, including the short rearing period, faster return on investment, low production costs, high food yield, and the high nutritional value of chicken meat. Therefore, it seems that the poultry industry development can play a significant role in improving global food security. The growth of Iran's poultry sector has increased significantly during the past fifty years. The poultry industry has significant impacts on all aspects of food security. Prevention, control, and treatment of various diseases on poultry farms are important issues in increasing meat and egg production and improving food security. Additionally, poultry veterinarians provide more healthy and high-quality products by managing broilers rearing period and monitoring the health of raw poultry products. Also, raising backyard ostriches and chickens in villages and small towns, resulting in reduced food insecurity. Industrialized nations increase food security using modern technologies and knowledge-based business in poultry science. It can be concluded that technical and managerial advances in the poultry industry can lead to increased poultry productivity, which is one of the most important ways to respond to the food needs of the country's population and improve food security.

Keywords*:* Chicken and ostrich meat, Eggs, Food security, Iran, Poultry industry.

az.hosseinian@gmail.com

Applications of carbon dots in food packaging: principles, development, future perspective

Sadaf Mohajjel Sadeghi[1], **Milad Tavassoli**[2*], Sahar Majnouni Algoo [3], Nasim Jafari Tabrizi[4]

1,2,3,4 Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

Background: Carbon dots (CDs) represent a recent addition to the nanocarbon category, displaying both crystalline and amorphous phases. These zero-dimensional spherical nanomaterials, with a size of <10 nm, have gained attention for being cost-effective, water-soluble, low in toxicity, biocompatible, and possessing notable functionalities (antibacterial, antioxidant, and light protection) properties. CDs exhibit a unique surface composition featuring oxygenated functional groups, including carbonyl (-C=O), amino (-NH2), hydroxyl (-OH), and carboxyl (-COOH) groups, endowing them with notable chemical versatility, water solubility, and functionalization capabilities.

Methods: In this study, we explored the applications of CDs for food packaging. According to the Scopus site, 70 studies have been conducted on this topic from 2020 to 2024.

Results: According to the results of articles, CDs used in the packaging industry exhibited strong antibacterial, antioxidant, and UV-blocking properties and show potential to enhance the barrier performance of food packaging against water vapor and oxygen. The application of CD-infused functional films extends to active packaging, contributing to the preservation of food quality, ensuring safety, and prolonging the shelf life of various packaged foods, especially those prone to photooxidation. CDs also influence the release behavior of bioactive molecules, serving as an effective encapsulating matrix. Additionally, the combination of CDs with bio-based polymers and hydrogel systems opens avenues for developing flexible films endowed with sensing capabilities like fluorescence emission and pH sensitivity.

Discussion: Therefore, CDs present in packaging materials increase the safety of packaged food. The findings underscore the efficacy of CDs in revolutionizing the field of food packaging.

Keywords*:* Carbon dots, Food packaging, Nanomaterials

* Milad Tavassoli

Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

mtavassoli2006@gmail.com

Advances in Intelligent Food Packaging: Utilizing natural pigments for enhanced safety

Sadaf Mohajjel Sadeghi[1], **Milad Tavassoli[2*]**

1,2 Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

Background: Food packaging has evolved towards multi-functionality, with a focus on smart packaging. This innovative approach not only elevates food quality and safety but also provides consumers with real-time, accurate information spanning the entire food processing to packaging disposal cycle. Intelligent packaging systems incorporate various indicator materials, reacting to volatile components produced during microbial or enzymatic reactions, offering insights into critical factors like dryness, pH, temperature, oxygen, light, and water activity. In recent years, various colorimetric pH indicators have been widely used in the food industry. Packaging industries are increasingly turning to natural colorants sourced from plants due to their distinctive qualities, including renewability, non-toxicity, biocompatibility, and ease of implementation.

Methods: According to Scopus 31 Studies conducted from 2020 to 2024 on this topic.

Results: Notable examples include sumac (Rhus coriaria L.), recognized for its antimicrobial properties and color changes within a different pH range; saffron (Crocus sativus L.), offering anthocyanins and phenolic compounds can be used as a natural pigment; red cabbage (Brassica oleracea), a rich source of anthocyanins with colors ranging from blue to green across a wide pH range; and black carrot (Daucus carota L.), containing anthocyanins, for pH-sensing indicators in intelligent packaging systems. There are also many other natural resources that are not mentioned here.

Discussion: The use of natural pigments in colorimetric pH indicators presents an environmentally friendly alternative to synthetic dyes. This study highlights the efficiency and versatility of natural pigments, emphasizing their potential widespread adoption in the realm of intelligent food packaging.

Keywords*:* Intelligent packaging, Colorimetric packaging, pH indicators, Natural pigments

* Milad Tavassoli

Department of Food Science and

Technology, Faculty of Nutrition and Food

Sciences, Tabriz University of Medical

Sciences, Tabriz, Iran

mtavassoli2006@gmail.com

Zinc Doped Carbon-Dot Embedded Locust bean gum/Chitosan- Composite Films for Potential Use in Active Food Packing Industry

Neshat Ahmadi[1], Nazli Dorod[2], Behnam Baharmian[2], Reza Abedi-Firoozjah[3] *

1. Department of Food hygiene, Tabriz Branch, Islamic Azad University, Tabriz, Iran

2. Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

3. Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background: Innovations in food packaging are crucial for ensuring food safety and extending shelf life. The integration of nanomaterials into biodegradable films has garnered significant attention due to their potential in active packaging applications. This study focuses on developing Zinc Doped Carbon-Dot Embedded Locust bean gum/Chitosan composite films as a promising solution for enhancing the quality and shelf life of packaged food products.

Methods: The composite films were prepared through solution casting method. The characterization of the composite films was performed using techniques such as X-ray diffraction, scanning electron microscopy, and Fourier-transform infrared spectroscopy to analyze their structural, morphological, and chemical properties.

Physic-mechanical, optical, and fuvnctional (antioxidant, antibacterial, and anti UV-Vis) propertis were also analyzed.

Results: The results indicate that the incorporation of Zinc Doped Carbon Dots enhanced the mechanical strength, barrier properties, and antimicrobial activity (complete eradication of *Listeria* monocytogenes and Escherichia coli) of the composite films.

Discussion: These properties make the films suitable for potential applications in the active food packaging industry. The interaction between the components of the composite films was found to contribute to their overall performance in preserving food quality and safety. The suggested composite films show great potential for use in active food packaging. Their improved mechanical, barrier, antimicrobial, and antioxidant properties make them a promising option for enhancing the shelf life and quality of perishable food products. Further research and development in this area could lead to the commercialization of these innovative composite films in the food packaging industry, benefiting both consumers and the environment.

Keywords*:* Active Food packaging, Potato Carbon dot, food quality and safety, Locust bean gum, Chitosan

*Corresponding Author: Reza AbediFiroozjah Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

r.abedi1878@gmail.com

Design and fabrication of active food packaging of polyvinyl alcohol/gelatin film incorporating carbon dots doped with manganese oxide/potato peel for ensuring the safety and quality of chicken breast

Neshat Ahmadi[1], Nazli Dorod[2], Behnam Baharmian[2], Reza Abedi-Firoozjah[3] *

1. Department of Food hygiene, Tabriz Branch, Islamic Azad University, Tabriz, Iran

2. Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

3. Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background: Active food packaging plays a crucial role in ensuring the safety and quality of perishable foods like chicken breast. In the case of chicken breast, active packaging can help extend the shelf life, reduce spoilage, and maintain freshness by addressing microbial and chemical spoilage factors.

Methods: The PVA/gelatin active packaging films were fabricated by a systematic process involving the preparation of carbon dots doped with manganese oxide and potato peel extracts through an electrospinning method. The film fabrication process and the characterization of its properties, such as antioxidant, antimicrobial, and light protection capabilities, were thoroughly investigated.

Results: The films showed good mechanical properties, strong antioxidant properties, protection against ultraviolet rays and strong antimicrobial activity (complete eradication of Listeria monocytogenes, Salmonella, Staphylococcus aureus, and Escherichia coli), contributing to the preservation of the safety and quality of chicken breast during storage.

Discussion: The findings of this study highlight the potential of utilizing active food packaging materials containing carbon dots doped with manganese oxide and potato peel extracts to ensure the safety and quality of chicken breast. This innovative packaging solution offers a promising alternative to traditional petroleum-based packaging, showcasing improved environmental sustainability and food preservation qualities. Further research and development in this area could lead to enhanced food packaging solutions with broader applications in the food industry.

Keywords*:* Electrospinning, Active Food packaging, Potato Peel Carbon dot, Quality and Safety, polyvinyl alcohol, gelatin, chicken breast

*Corresponding Author: Reza AbediFiroozjah Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

r.abedi1878@gmail.com

Design, development and characterization of polyvinyl alcohol/starch-based active packaging films containing curcumin loaded Ag@metal-organic frameworks

Shamimeh Azimi Salim[1], Neshat Ahmadi[2], Mohammad Ranjbari[3], Reza Abedi-Firoozjah[1]*

1. Employee, Food and Drug Organization, Hamedan University of Medical Sciences, Iran

2. Department of Food Science and Technology, Islamic Azad University of Tabriz, Iran

3. Department of Food Science and Technology, National Nutrition and Food Technology Research Institute, Faculty of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran,

Background: Active packaging films play a crucial role in improving the shelf life and safety of food products by incorporating functional materials. This study focuses on the design, development, and characterization of polyvinyl alcohol (PVA)/starch-based active packaging films containing curcumin loaded Ag@Metal-Organic Frameworks (CUR-Ag@MOFs-PVA/St) to enhance mechanical properties, physical characteristics, microstructure, antioxidant capacity, and antibacterial functionality.

Methods: The research methodology involved the preparation of PVA/starch blends with varying concentrations of curcumin loaded Ag@MOFs using casting method. The films were subjected to mechanical tests to assess tensile strength and elongation properties. Physical properties such as water vapor permeability and oxygen barrier were evaluated. Microstructural and morphological analysis was conducted using SEM, XRD, and FTIR. Additionally, the antioxidant capacity and antibacterial properties of the films were investigated to evaluate the

effectiveness of the incorporated Ag@MOFs and curcumin.

Results: The obtained results indicated a substantial improvement in the mechanical strength of the active packaging films upon the integration of curcumin loaded Ag@MOFs into the PVA/starch matrices. Microstructural analysis revealed a uniform dispersion of Ag@MOFs, contributing to enhanced barrier properties. The antioxidant capacity of the films was significantly boosted, suggesting increased potential for food preservation. Furthermore, the antibacterial properties demonstrated the efficacy of Ag@MOFs and curcumin in inhibiting microbial growth, thereby enhancing food safety.

Discussion: The results highlight notable enhancements in mechanical, physical, microstructural, antioxidant, and antibacterial properties of the films attributed to the incorporation of Ag@MOFs and curcumin. These active packaging materials hold promise for extending the shelf life and ensuring the safety of food products.

Keywords*:* Curcumin, Ag@Metal-Organic Frameworks, Active Food packaging, Food Preservation, Ponpolyvinyl Alcohol, Starch

*Corresponding Author: Reza AbediFiroozjah Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

r.abedi1878@gmail.com

Catechin Loaded Fe-MOF in Multifunctional Food Packaging Films-based Soy protein isolate/Methyl cellulose for food packaging applications

Reza Abedi-Firoozjah[1], Nazli Doeoud[2], Neshat Ahmadi[3], Mohammad Ranjbari[4], Milad Tavassoli[2] *

1. Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

2. Student Research Committee, Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

3. Department of Food Science and Technology, Islamic Azad University of Tabriz, Iran

4. Department of Food Science and Technology, National Nutrition and Food Technology Research Institute, Faculty of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Background:

In the realm of food packaging, the integration of functional materials has become pivotal to enhance the safety and quality of packaged products. In this regard, active packaging plays a vital role in maintaining the quality and extending the shelf life of perishable seafood.

Methods: The experimental methodology involved the preparation of SPI/MC blends with various concentrations of Catechin Loaded Fe-MOF. The films were characterized for their mechanical properties using tensile strength and elongation tests. The physical properties were evaluated through water vapor permeability and oxygen barrier measurements. The microstructural analysis was conducted using scanning electron microscopy. Furthermore, the antioxidant capacity and antibacterial properties of the films were assessed to

determine the efficacy of the incorporated Fe-MOF and Catechin.

Results: The results revealed that the introduction of Catechin Loaded Fe-MOF into the SPI/MC matrix significantly improved the mechanical strength of the packaging films. The microstructural analysis indicated a homogenous dispersion of Fe-MOF within the film matrices, contributing to enhanced barrier properties. Moreover, the antioxidant capacity of the films was substantially increased, highlighting the potential for extending the shelf life of packaged food products. Additionally, the antibacterial properties demonstrated the efficacy of Fe-MOF in inhibiting microbial growth, thereby enhancing food safety.

Discussion: The results underscore the significant enhancement in mechanical, physical, microstructural, antioxidant, and antibacterial properties of the films due to the incorporation of Fe-MOF. The formulated films hold great potential for applications in food packaging, offering improved preservation and safety benefits for a wide range of food products.

Keywords*:* Catechin, Metal-Organic Frameworks (MOFs), Fe-MOF, Soy protein isolate, Methyl Cellulose, Active Packaging, Perishable Seafood

*Corresponding Author: Milad Tavassoli Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

mtavassoli2006@gmail.com

Preparation of intelligent active packaging film of gelatin/κ-carrageenan containing lemon peel carbon dots and saffron petal anthocyanins

Nazli Dorod[1], Neshat Ahmadi[2], Behnam Baharmian[1], Reza Abedi-Firoozjah[3], Milad Tavassoli[1]*

1 Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

3. Department of Food Science and Technology, Islamic Azad University of Tabriz, Iran

3. Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background: Food packaging plays a crucial role in preserving the safety and quality of food products. In light of the negative impact of petroleum-derived packaging on both health and the environment, there has been a shift towards exploring biodegradable packaging solutions. Carbon dots have emerged as promising fillers in active packaging matrices owing to their antioxidant, antimicrobial, biocompatible, cost-effective, and light-protective characteristics. Natural pigment (saffron anthocyanin) was included in these films as pH-responsive color indicators.

Methods: The smart active packaging film was prepared through a systematic methodology that involved the preparation of lemon peel carbon dots and extraction saffron petal anthocyanin. These bioactive components were then incorporated into a gelatin/κ-carrageenan matrix to form the active packaging film. The microstructural, physical, mechanical, hydrodynamic,

optical aspects as well as functional film's properties, including its antioxidant and antimicrobial activities, were thoroughly investigated.

Results: The smart active packaging film containing lemon peel carbon dots and saffron petal anthocyanin exhibited enhanced properties suitable for food packaging applications. The film demonstrated strong antioxidant capabilities and exhibited antimicrobial activity against common foodborne pathogens, showcasing its potential for improving food safety and quality. The films changed color in response to alterations in the freshness of the fish samples, which was correlated to ammonia production during fish degradation.

Discussion: The incorporation of lemon peel carbon dots and saffron petal anthocyanins in the gelatin/κ-carrageenan film offers a sustainable and functional solution for active packaging. The synergistic effects of these bioactive components contribute to the film's overall efficacy in preserving food products by inhibiting oxidation and microbial growth.

Keywords*:* Intelligent and Active Film, Food packaging, Limon Peel Carbon dot, gelatin, κ-carrageenan, pH-responsive color indicators

*Corresponding Author: Milad Tavassoli Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

mtavassoli2006@gmail.com

Preparation of active packaging of gelatin/nanofiber chitin with red barberry anthocyanins/*Mirabilis jalapa* carbon dots for shrimp packaging application

Nazli Dorod[1], Neshat Ahmadi[2], Reza Abedi-Firoozjah[3], Milad Tavassoli[1]*

1 Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

1 Department of Food Science and Technology, Islamic Azad University of Tabriz, Iran

3. Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background: Intelligent active packaging systems have gained significant attention in the food industry for their ability to extend shelf life and maintain food quality. This study proposes the development of an innovative active packaging material using gelatin/nanofiber chitin blend incorporated with red barberry anthocyanins and Mirabilis jalapa carbon dots.

Methods: The active packaging film was prepared through casting method by blending gelatin and nanofiber chitin, and embedding red barberry anthocyanins and Mirabilis jalapa carbon dots to enhance its antimicrobial and antioxidant properties. The fabrication process and characterization of the film's color-changing mechanism upon exposure to spoiled shrimp were meticulously investigated. The prepared films' mechanical, barrier, thermal stability, and antibacterial/antiradical/anti-UV properties were also analyzed

Results: FTIR, SEM, and XRD indicated the carbon dots and pigments were dispersed throughout the biopolymer matrix, and identified the important

molecular interactions involved (like hydrogen and electrostatic bonding). More so, the presence of the anthocyanins and carbon dots increased the bacteriostatic properties of the smart films, as well as inhibiting oxidative reactions. The suggested smart films exhibited a visible color transition from red to yellow in response to shrimp spoilage.

Discussion: The development of active packaging materials with color-changing capabilities based on gelatin/nanofiber chitin, red barberry anthocyanins, and Mirabilis jalapa carbon dots presents a promising solution for shrimp packaging applications. The visual indication of shrimp spoilage through a red to yellow color transition in the film provides a user-friendly tool for assessing food freshness. This innovative active packaging system demonstrates the potential to revolutionize the shrimp packaging industry by improving traceability and reducing food waste.

Keywords*:* Intelligent and Active Film, red barberry anthocyanins, Mirabilis jalapa, gelatin, nanofiber chitin, pH-responsive color indicators, shrimp packaging

*Corresponding Author: Milad Tavassoli Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

mtavassoli2006@gmail.com

An overview of the methods of using bacteriocins obtained from lactic acid bacteria in the biological preservation of meat products

Dr. Masoud Sami[1], ZahraAbasi[1*]

Nutrition and Food Safety Research Center, Department of Food Science and Technology, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran

Background: Meat products have always been an important part of human diet and contain valuable nutrients for growth and health. However, these products are perishable and prone to microbial contamination, which increases health risks for consumers and economic losses for producers. In the industry, preservatives such as sodium or potassium nitrite and nitrate are used in order to inhibit microbial growth, stabilize color, and add specific flavor and aroma. In addition to the benenficial effects of using these compounds, their excessive consumption can have health risks, for example, the formation of nitrosamine compounds in the body. For this reason, due to the dangers of using artificial chemical additives, natural antimicrobial agents such as bacteriocins have received the attention of researchers. Bacteriocins are non-toxic peptides produced by lactic acid bacteria that have antimicrobial activity and as natural preservatives have received special attention in recent years due to their potential application in the food industry.

Methods: In the current review, it was searched the keywords of lactic acid bacteria, bacteriocin, meat products and shelf life in Google Scholar, Web of Science and Scopus databases without time limitation.

Results: A lot of research has been done on the application of bacteriocins in meat products. The use of bacteriocins in meat

products aims to increase shelf life, preserve their organoleptic properties and antimicrobial properties. The potential of using bacteriocins can depend on their pH, temperature and mode of action. In fact, the use of bacteriocins in the conducted research describes different strategies, which include direct addition in food formula or immersion in a solution containing peptides, absorption of bacteriocins in polyethylene films, cellulose edible films and on surfaces such as ethylene vinyl acetate and polypropylene. And antimicrobial coatings contain bacteriocin in the packaging formulas of meat products.

Discussion: The review of the literature indicates the need for more studies to evaluate the toxicity and effect of bacteriocins in the food matrix. In addition, according to the reported strengths, other studies should be conducted on pathogenic and spoilage microorganisms in order to ensure the safety and quality of meat products. Finally, it is clear that the wide application possibility of bacteriocins should not be considered as a solution, but as a good alternative in terms of food safety, especially when combined with other techniques.

Keywords*:* Lactic acid bacteria , Bacteriocin , Meat products, shelf life

*Zahra Abbasi

Master student of food health and safety, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran

zahraabasizz339@gmail.com

Integrated gelatin/chitosan nanofibrous with zinc-doped carbon dots of eggplant peel for active packaging of strawberries

Mohammad hadi moradian[1], Narges Sarraf ov [2], Shamimeh Azimi Salim[3], Reza Abedi-Firoozjah[4], Fatemeh Mollaei[5*]

1.2.5. Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

3. Employee, Food and Drug Organization, Hamedan University of Medical Sciences, Iran

4. Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background: As the demand for sustainable and effective packaging solutions grows, the development of novel materials for active packaging applications is imperative. In this study, embedded gelatin/chitosan-nanofibrous films with zinc-doped carbon dots of eggplant peel were developed to enhance the packaging of strawberries.

Methods: The nanofibrous films were prepared through an electrospinning technique, incorporating zinc-doped eggplant peel carbon dots into a gelatin/chitosan matrix. The mechanical properties, physical characteristics, microstructure, antioxidant capacity, and antibacterial activity of the films were systematically evaluated.

Results: The results demonstrated that the incorporation of zinc-doped eggplant peel

carbon dots significantly improved the mechanical strength of the nanofibrous films. Additionally, the presence of the carbon dots enhanced the antioxidant properties of the films, prolonging the shelf-life of strawberries by reducing oxidative degradation. Furthermore, the antibacterial efficacy of the films was demonstrated against common foodborne pathogens, highlighting their potential for food preservation applications. The microstructural analysis revealed a uniform distribution of carbon dots within the gelatin/chitosan matrix, enhancing the overall properties of the nanofibrous films. The synergistic effects of zinc doping and carbon-dot embedding contributed to the multifunctional nature of the packaging material, offering both mechanical support and active preservation capabilities.

Discussion: The combination of mechanical strength, antioxidant capacity, and antibacterial activity makes these films highly suitable for active packaging applications, contributing to the preservation and quality maintenance of perishable foods like strawberries.

Keywords*:* electrospinning, active food packaging, eggplant, gelatin, chitosan, strawberries

*Corresponding Author: Fatemeh Mollaei

Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

farima.m1374@gmail

Curcumin Loaded Cr-MOF in Food Packaging based on Soy protein isolate/Chitosan film for shrimp preservation

Narges Sarraf ov [1], Mohammad hadi moradian [2], Shamimeh Azimi Salim[3], Reza Abedi-Firoozjah[4], Fatemeh Mollaei[5*]

1.2.5. Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

3. Employee, Food and Drug Organization, Hamedan University of Medical Sciences, Iran

4. Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background: In response to the increasing demand for sustainable and active food packaging solutions, the development of novel materials is crucial. This study focuses on the incorporation of curcumin-loaded Cr-MOF into Food Packaging Films based on Soy Protein Isolate/Chitosan for the packaging of shrimp, aiming to enhance food preservation and safety.

Methods: The food packaging films were prepared by blending soy protein isolate and chitosan with curcumin-loaded chromium Metal-Organic Framework (Cr-MOF) using a casting method. The mechanical properties, physical characteristics, microstructure, antioxidant capacity, and antibacterial activity of the films were thoroughly examined.

Results: The incorporation of curcumin-loaded Cr-MOF into the food packaging films resulted in a significant improvement in mechanical strength, making them

suitable for packaging applications. The films exhibited enhanced antioxidant properties due to the presence of curcumin, extending the shelf-life of shrimp by inhibiting oxidative degradation. Additionally, the films demonstrated substantial antibacterial activity against common foodborne pathogens, ensuring food safety during storage and transportation.

Discussion: Microscopic analysis revealed a well-dispersed distribution of curcumin-loaded Cr-MOF within the soy protein isolate/chitosan matrix, contributing to the overall structural integrity and functionality of the packaging films. The synergistic effects of curcumin, Cr-MOF, soy protein isolate, and chitosan provided a multifunctional packaging system with mechanical strength, antioxidant capabilities, and antibacterial properties. In this regard, enhanced antioxidant potential and effective antibacterial activity make these films promising for improving food preservation and quality in the shrimp packaging industry.

Keywords*:* Active Food packaging, Curcumin, Soy protein isolate, Chitosan, Shrimp

*Corresponding Author: Fatemeh Mollaei

Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

farima.m1374@gmail

Application of chitosan in food packaging films: a mini review

Sahar Majnouni Algoo[1], Milad Tavassoli[2*], Nasim Jafari Tabrizi[3], Sadaf Mohajjel Sadeghi[4]

1,2,3,4 Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

Background: Recently, increasing environmental and health concerns due to the widespread use of plastic packaging has led to the use of bio-based alternatives. Chitosan is a polysaccharide derived from chitin, biodegradable and renewable which due to its specific physicochemical properties, chemical stability, chelation, excellent film-forming properties, as well as antioxidant, antimicrobial and antifungal activities is recognized as a promising alternative.

Methods: To identify studies relevant to this study, a review of Scopus, PubMed, and Google Scholar articles was conducted by searching for the keywords "chitosan and chitosan food packaging" in the last ten years.

Results: 672,000 articles with the title "chitosan" have been published, of which 22,000 articles are related to "chitosan food packaging". Among the many articles available with different titles and characteristics, some important and relevant articles were used.

Discussion: European Union rules require safety of food packaging materials due to food contact, and chitosan is a suitable material for this aim. The high sensitivity to

moisture and poor thermal and mechanical stability of chitosan has reduced the storage time of food by this biopolymer compared to other packaging materials, which solutions to increase the useful features and reduce the disadvantages of chitosan, including the addition of crosslinkers, fillers, active compounds and plasticizers, complexation and blending with other natural and synthetic polymers have been provided. Also, chitosan can be added as a filler to other polymers to improve some of their characteristics. However, more research is needed to develop chitosan-based packaging to compete comprehensively with synthetic plastic packaging.

Keywords*:* chitosan, food packaging, biodegradable, biopolymer

* Milad Tavassoli
* Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

mtavassoli2006@gmail.com

Factors affecting the use of healthy food - Ilam province: A survey study in southwest Iran

Reza Jorvand[1,2,] *

Assistant Professor, Department of Public Health, School of Health, Ilam University of Medical Sciences, Ilam, Iran.

Background: Healthy diet as a determinant of health is one of the key strategies of public health policy. The present study was conducted to investigate the factors affecting the use of healthy food among adults in Ilam province.

Methods: In 2023 and in this descriptive-analytical study, 2150 clients aged 18 to 65 in Ilam province were examined. The data collection tool was the LSQ questionnaire along with the researcher-made questionnaire; Sampling was done in clusters in the form of 44 clusters (22 urban clusters and 21 rural clusters); Each cluster included 50 samples. Data were analyzed using SPSS25 software and descriptive statistical tests, Pearson's correlation coefficient and one-way analysis of variance with a significance level of 0.05.

Results: The average age of the participants was 39.43 ± 12.33 years. More than 25% of the participants expressed their economic situation as very good and good and 27.3% as poor. 74.6% of the participants stated that they do not have healthy nutrition; Among these, about 38% of the participants declared lack of constant access to healthy food, about 24% high prices, and 19% lack of confidence in industrial products as the most important reasons for not having a healthy diet.

Discussion: The study showed that unhealthy nutrition was present in a large number of participants; Lack of access, economic problems and lack of confidence in food producing companies were determined as the most important reasons for not having healthy nutrition; which requires the cooperation of experts and politicians to solve them.

Keywords: Healthy diet, Adults, Ilam.

*Corresponding Author: Reza Jorvand Assistant Professor, Department of Public Health, School of Health, Ilam University of Medical Sciences, Ilam, Iran.

jorvand-r@medilam.ac.ir,

Spirulina: a valuable biological resource

Reza Habibi[1], Maryam Azar[2,*], Fatemeh Fathimoghadam[3,*], Farnaz Bakhtiari[4,*]

1 Graduate Master, Food Science and Industry Engineering, Department of Food Science and Technology, Ahwaz Branch, Islamic Azad University, Ahwaz, Iran.

2 Graduate Master, Food Science and Industry Engineering, Department of Food Science and Technology, Ahwaz Branch, Islamic Azad University, Ahwaz. Iran.[3]

3 Ph.D. Student, Food Science and Industry Engineering, Department of Food Science and Technology, Sarvestan Branch, Islamic Azad University, Sarvestan. Iran.

4 Graduate Master, Food Science and Industry Engineering, Department of Food Science and Technology, Ahwaz Branch, Islamic Azad University, Ahwaz. Iran.

Spirulina, a photosynthetic cyanobacterium, is an important biological source for the production of novel products and is considered a valuable nutritional source for humans, animal feed, poultry, and aquaculture. It contains nutritious and valuable compounds such as pigments, antioxidants, unsaturated fatty acids, non-protein compounds, vitamins, pharmaceutical compounds, and other bioactive compounds. This important product is commercially produced in most countries and is used as nutritional supplements and effective pharmaceutical compounds.

Keywords: Cyanobacteria, bioactive, pharmaceutical compounds

2* Azar3116@yahoo.com
Graduate Master, Food Science and Industry Engineering, Department of Food Science and Technology, Ahwaz Branch, Islamic Azad University, Ahwaz. Iran.3

3*Fatemeh.Fathimoghadam96@Yahoo.com
Ph.D. Student, Food Science and Industry Engineering, Department of Food Science and Technology, Sarvestan Branch, Islamic Azad University, Sarvestan. Iran.

4* Farnaz.bakhtiari1992@gmail.com
Graduate Master, Food Science and Industry Engineering, Department of Food Science and Technology, Ahwaz Branch, Islamic Azad University, Ahwaz. Iran.

habibireza1370@gmail.com

Investigating the effect of vitamin D supplementation on prevention and treatment ostf Rheumatoid Arthritis(RA): A Systematic Review

Seyedeh Taravat Mortazavi1,Mehdi Arjmand1, Rezvan Chaharlang1,Elnaz Charoosaei1, Arash Seraj zade1

1. Student research committee, Jondishapur University of medical science, Ahvaz, Iran

Background: Rheumatoid Arthritis is a chronic, progressive joint disease caused by inflammatory responses. By remaining the main cause of the disease unknown, determining an appropriate way to prevent and treating it is a goal of controlling the

disease. Considering effects of vitamin D on immune system mechanisms, it is expected that vitamin supplementation would be effective on controlling process. This study examines the effects of vitamin D supplementation on improving Rheumatoid Arthritis.

Methods: Various databases like PubMed, Google Scholar concluding keywords Rheumatoid Arthritis, Vitamin D, and Inflammatory Reactions without time restrictions were checked. 35 studies were reviewed and finally 12 studies were included in this review and all studies reviewed studies were in English.

Results: Studies reported individual's abnormal low-existence of vitamin D in Plasma, which may indicate that achieving appropriate level of vitamin D would be effective on improving disease. Group of studies referred to the anti-inflammatory and immune-modulating effects of vitamin D. Adequate level can alter production of inflammatory cytokines and inhibit production of T-helper1 cells, thus shifting immune responses. Therefore, Pro-inflammatory responses of T-helper1 and T-helper17 will be suppressed while T-helper2 and T-regulation responses will be enhanced having modulatory effect. However, meta-analysis studies didn't show any significant relationship between vitamin supplementation and disease improvement, which may be due to unclear pathogenesis, epidemiological and physiological differences.

Conclusion: Considering the low level of vitamin D in patients, it is expected that vitamin D supplementation would have an impact on the immune system and bones, making the treatment process more effective. Hence more researches should be done due to lack of effectiveness-evidences of vitamin D on improving conditions in Rheumatoid Arthritis patients.

Keywords: Rheumatoid Arthritis, vitamin D, Inflammatory, Vitamin D deficiency, vitamin D supplement

mortazavi.taravat@gmail.com

A systematic review of the effect of Green tea on the prevention of mortality from cardiovascular diseases

Arash Seraj zadeh1**,** Mehdi Arjmand1**,** , Maedeh Aliakbari1,Mohammad Alikhah1

1. Student research committee, Jondishapur University of medical science, Ahvaz, Iran

Background: Introduction: Some studies have shown that consumption of green tea can be beneficial for health. Green tea contains antioxidants and active plant substances such as flavonoids and caffeine that may have positive effects on health. On the other hand, heart diseases are one of the most important categories of diseases that cause death in different societies and are among the most important causes of death in the world.

In this article, we will examine the effect of tea on the prevention of deaths caused by this disease.

Methods: Systematic review study, selection of 10 samples from 30 studies without time limit on PubMed, Google Scholar databases. Articles were searched

based on meta-analysis and clinical studies and English language.

Results: New studies with the participation of more than 1000,000 people from around the world show that tea consumption, due to the presence of catechins, flavonoids and caffeine, can act as a relaxing agent for the central nervous system and have positive effects on metabolic syndrome and diabetes control by increasing levels. Have blood lipids. Also, these researches show that the consumption of tea, especially green tea, may be effective in preventing cardiovascular diseases and deaths caused by them. The limit recommended in this research is to consume a maximum of 3 cups of tea.

Also, genetic tests have also confirmed the results that consumption of tea and its components can have positive effects.

Discussion: According to these findings, moderate consumption of tea, especially green tea, can be recommended as a therapeutic and preventive model for the occurrence of cardiovascular and metabolic diseases.

Keywords*:* Green tea, cardiovascular diseases, catechins, flavonoids, caffeine

arash.iran91@gmail.com

Zinc Doped Carbon-Dot Embedded Arabic gum/Chitosan-nanofiber mats for active packaging applications of fresh strawberry

Milad Tavassoli[1], Nazli Doroud[1], Behnam Baharmian[1], Neshat Ahmadi[2], Reza Abedi-Firoozjah[3] *

1. Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

2. Department of Food Science and Technology, Islamic Azad University of Tabriz, Iran

3. Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background: Most fruit are highly perishable and rapidly undergo postharvest deterioration. Thus, preventing such quality degradation during storage and distribution is a fundamental challenge for marketing from an economic and technical point of view. Active packaging systems play a crucial role in extending the shelf life of perishable fruits like strawberries.

Methods: Zinc doped tomato peel-derived carbon dots (Zn-tCDs) were fabricated using a facile hydrothermal method to prepare Arabic gum/Chitsan-based (AG/Chi@Zn-tCDs) active food packaging films, developed through the electrospinning method. The AG/Chi@Zn-tCDs films were characterized by UV light spectroscopy, photoluminescence spectroscopy, FTIR, SEM, atomic force microscope (AFM), and transmission electron microscope (TEM) techniques. The mechanical, thermal, barrier, ammonia-sensitivity, antimicrobial, antioxidant, anti-UV and biodegradable characteristics of the films were investigated.

Results: The integration of Zn-tCDs in the Arabic gum/chitosan-nanofiber mats significantly improved the mechanical and moisture resistance of the films. Spectroscopic and microstructural analysis indicated the nanoparticles and pigments were dispersed throughout the biopolymer matrix, and identified the important molecular interactions involved (such as hydrogen and electrostatic bonding). Incorporation of Zn-tCDs also enhanced their antimicrobial efficacy, thereby inhibiting microbial growth and extending the shelf life of fresh strawberries. The active nanofiber mats were shown to be biodegradable, decomposing within ~4 weeks under simulated environmental conditions.

Discussion: The development of Zn-tCDs embedded AG/Chi-nanofiber mats presents a promising approach for active packaging applications targeted at fresh strawberries. The synergistic effects of the materials' components contribute to improved antioxidant activity, ensuring the preservation of strawberry quality during storage and transportation.

Keywords*:* Electrospinning, Active Food packaging, Tomato Peel Carbon dot, Zinc doped CDs, postharvest deterioration, Arabic gum, Chitsan, Strawberry

*Corresponding Author: Reza AbediFiroozjah Student Research Committee, Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

r.abedi1878@gmail.com

Unveiling the Marvels of Metal-Organic Framework-Assisted Sensing Systems: Revolutionizing Point-of-Care Antibiotics Detection in the Food Industry-A Mini Review

Behnam Baharmian[1], Neshat Ahmadi[2], Mohammad Ranjbari[3], Reza Abedi-Firoozjah[4], Milad Tavassoli[1]*

1. Student Research Committee, Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

2. Department of Food Science and Technology, Islamic Azad University of Tabriz, Iran

3. Department of Food Science and Technology, National Nutrition and Food Technology Research Institute, Faculty of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

4. Department of Food Science and Technology, School of Nutrition Sciences and Food Technology, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background: Antibiotics (ANBs) are essential for animal health and are used for treatment, prevention, and growth promotion. However, ANB use in animals can lead to antibiotic residue in food products, which can cause various side effects. The most significant adverse effect is the transfer of ANB-resistant bacteria to humans due to the mobile properties of resistance. Therefore, timely detection is the best approach to prevent the spread of downsides of these compounds. However, complicated sample preparation processes and expensive equipment are often considered obstacles to their prevalent usage. Emerging technologies like Metal-

Organic Frameworks (MOFs) offer a simpler, quicker, and more cost-effective solution for detecting veterinary drugs in animal-derived food samples.

Methods: This investigation first reviews some conventional methods for ANB recognition, including microbiological, immunological, and laboratory-based procedures. Then, Sensor-based analytical methods and their advantages and disadvantages were discussed. Finally, the recent progress in ANB detection approaches using MOF-based sensors in food products was investigated.

Results: MOFs have become a topic of great interest due to their remarkable properties. These include high surface areas that can be easily modified, defined porosity, lightweight, adjustable pore sizes, ordered structures, and impressive mechanical strength. The performance of MOFs is superior to traditional chemosensory materials due to their ability to adjust properties.

Discussion: The discussion section highlights key advancements in MOF-assisted sensing systems, such as improved selectivity towards specific antibiotics, increased detection sensitivity, rapid response times, and enhanced portability for on-site testing. Moreover, the versatility of MOFs in functionalizing various sensing elements contributes to the customization of detection platforms for diverse antibiotic compounds in food matrices. In conclusion, the utilization of MOFs in sensing systems represents a significant paradigm shift in point-of-care antibiotics detection within the food industry.

Keywords*:* Antibiotics, Metal-Organic Frameworks (MOFs), Detection Platforms, Point-of-Care, Sensing Systems, Food Industry

*Corresponding Author: Milad Tavassoli Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

mtavassoli2006@gmail.com

The effects of sumac powder supplementation in patients with non-alcoholic fatty liver disease (NAFLD): a Systematic Review

Mohamad Javad Pouryousefi Dezfuli[1*], Pouya Bamneshin[1] ،Zahra Asadi[1]، Ayda Zahednia[1]

1-Student Research Committee, Ahvaz Jondishapour University of

Medical Sciences, Ahvaz, Iran

Background: In recent years, attention has been paid to the role of herbal medicines in the management of non-alcoholic fatty liver disease(NAFLD).There is evidence to suggest that sumac is beneficial for improving NAFLD due to its bioactive compounds. The aim of this study was to investigate sumac powder supplementation on the improvement of NAFLD.

Methods: A systematic review considered all articles published from2015to2023.by advanced search in Pubmed,Medline,Scopus,Web of Science and Google Scholar search engine using relevant keywords and their mesh terms with inclusion criteria(studies only in English,clinical trials only,no full-text access restrictions)and Exclusion

criteria(systematic review and meta-analysis studies,repetitive and low-quality studies)among 450 articles,after screening the titles and abstracts in terms of relevance,13articles were selected for full text review.Among the selected articles,5studies with 250 participants were included in the final analysis.

Results: Investigations showed that AST,ALT,ALP,total cholesterol,LDL-C and triglyceride(TG)glyceride decreased,but HDL-C in the sumac group compared to the placebo group,increased steatosis in the sumac group compared to the drug, the differences improved.No difference was seen in GGT and leptin.In sumac group,fibrosis as well as FBS,serum insulin,HbA1c,HOMA-IR,MDA and hs-CRP decreased compared to placebo.Longer interventions(more than 12 weeks)have a more favorable effect on TC,LDL-C and HDL-C.

Discussion and conclusion:(This review suggests that sumac powder may be effective in reducing blood pressure,serum liver enzymes,and steatosis in people with NAFLD.Also,it can improve lipid profile.However,studies with a larger statistical population and a longer intervention period are needed.

Keywords: Sumac ،Non-alcoholic liver disease ،NAFLD ، lipid profile،Rhus Coriaria L

*Mohamad Javad Pouryousefi Dezfuli Student Research Committee, Ahvaz Jondishapour University of Medical Sciences, Ahvaz, Iran

jvdpys@gmail.com

Effects of probiotics, prebiotics and synbiotics in non-alcoholic fatty liver disease (NAFLD); a systematic review

Mohamad Javad Pouryousefi Dezfuli[1*], Pouya Bamneshin[1]،Zahra Asadi[1]،Ayda Zahednia[1]

1-Student Research Committee, Ahvaz Jondishapour University ofMedical Sciences, Ahvaz, Iran

Background: The use of probiotics, prebiotics and synbiotics is a promising specialist for the regulation of intestinal microbiota and beneficial environment in patients with non-alcoholic diseases. The aim of this study is to investigate the effectiveness of probiotics, prebiotics and synbiotics in patients with NAFLD.

Methods: A systematic review considered all articles published from2015to2023.by advanced search in Pubmed,Medline,Scopus,Web of Science and Google Scholar search engine using relevant keywords and their mesh terms with inclusion criteria(studies only in English,clinical trials only,no full-text access restrictions)and Exclusion criteria(systematic review and meta-analysis studies,repetitive and low-quality studies)among 450 articles,after screening the titles and abstracts in terms of relevance,13articles were selected for full text review.Among the selected articles,6studies with 360 participants were included in the final analysis.

Results: The studies used in this systematic review showed that the gut microbiota can indicate glycemia, insulin resistance, functional markers, dyslipidemia, obesity,

decrease consumption of enzymes and decrease consumption and improve fibrosis.

Discussion and conclusion: Microbiota modulators can be useful as an effective adjunctive treatment for NAFLD and its spectrums, either by improving the intestinal barrier or by preventing the formation of liver-toxic metabolites or by influencing the immune system. More intervention time is needed.

Keywords: non-alcoholic fatty liver disease ،prebiotic ،probiotic ،symbiotic ،microbiota

*Mohamad Javad Pouryousefi Dezfuli Student Research Committee, Ahvaz Jondishapour University of Medical Sciences, Ahvaz, Iran

jvdpys@gmail.com

A histomorphological study on aortic wall, following dietary intake of 10%corn oil in rabbit

Seyed mohammad Hosein noori Mogahi[1*], Emel Jenadele[2], Nazanin Mansouri[2]

1 Professor, Dept. of Midwifery, Faculty of Nursing and Midwifery, Ahwaz Branch, Islamic Azad University, Ahwaz, Iran[1].

2 B.Sc. Student of Midwifery, Dept. of Midwifery, Faculty of Nursing and Midwifery, Ahwaz Branch, Islamic Azad University, Ahwaz, Iran[1].

3 B.Sc. Student of Midwifery, Dept. of Midwifery, Faculty of Nursing and Midwifery, Ahwaz Branch, Islamic Azad University, Ahwaz, Iran[1].

* Corresponding Author

Dept. of Midwifery, Faculty of Nursing and Midwifery, Ahwaz Branch, Islamic Azad University, Ahwaz, Iran[1].

noorimoo@sina.tums.ac.ir

Background: One of the most important causes for cardiovascular diseases is atherosclerosis which is occurred by means of various factors such as age, diabetes and fat diet. Among fatty acids, about the effect of ω-6 polyunsaturated fatty acids, which are rich in vegetable oils is controversy. So this study aims to evaluate the effect of duration of 10%corn oil feeding on formation of atherosclerosis plaque in the wall of aorta in rabbits.

Methods: 24 female Albino rabbits weighing 1800-2000 gr around 4 – Month-Old were randomly divided in 3groups (A, B & C) with 2 subgroups including control and experimental in each one. In experimental groups 10% corn oil was added to standard chow diet, for one, two and three months in groups A, B & C respectively. The animals were observed and weighed at defined time. Then animals were scarified. Entire aortas were fixed with 10% formalin. 5µm thickness paraffin-embedded tissue sections were stained with hematoxylin and eosin (H&E) and observed under light microscope.

Aortic Wall thickness was measured using Image tools III Microsoft software. Analysis was made by SPSS-16 software and One-Way ANOVA followed by Tukey post hoc test to evaluate the statistical

significance between different groups. A value of $p < 0.05$ was considered statistically significant.

Results: Our results showed that 10% corn oil feeding may can cause atherosclerotic plaque.

Discussion: According to our results, the average of increased weighting compared to control group, was significantly higher in all groups at the end of first month of feeding. Also, in groups B and C at the end of second month the same result was observed but there was no increased weighting at the end of third month in group C. Also increased atherosclerotic plaque thickness observed following corn oil feeding in all groups. The plaque in group B was thicker than group A, and in group C the thickest plaque was observed.

Key words: Corn oil, Atherosclerotic plaque, Aorta, Gaining weight

noorimoo@sina.tums.ac.ir

Study of histological changes following lead- acetate in the rabbit Aorta and artery

Seyed Mohammad Hosein Noori Mogahi[1]*, Fatemeh Shahabi[2], Nasim Yuosefi[2]

1 Professor, Dept. of Midwifery, Faculty of Nursing and Midwifery, Ahwaz Branch, Islamic Azad University, Ahwaz, Iran[1].

2 B.Sc. Student of Midwifery, Dept. of Midwifery, Faculty of Nursing and Midwifery, Ahwaz Branch, Islamic Azad University, Ahwaz, Iran.

3 B.Sc. Student of Midwifery, Dept. of Midwifery, Faculty of Nursing and Midwifery, Ahwaz Branch, Islamic Azad University, Ahwaz, Iran.

* Corresponding Author

Dept. of Midwifery, Faculty of Nursing and Midwifery, Ahwaz Branch, Islamic Azad University, Ahwaz, Iran[1].

noorimoo@sina.tums.ac.ir

Background: Biological lead pollution due to the industrial advances is increasing which threatens the life of beings.Besides,Cardiovascular diseases are among the most common causes of mortality and morbidity. Hence, the effects of lead on cardiovascular diseases are studied in this survey.

Methods: 10 female albino rabbits,chosen by simple randomized sampling were divided into two 5-member groups. The cotrol group,were given distilled water and test group , were given lead-acetate, 0./13 % in distilled water for 2 months.After the exposure period, Arteries were dissected and the cuts with H&E techniqe to microscopic study of tissue construction changes.

Results: Group test, revealed endothelial cells damage in intima layer: acidophilic changes to complete damage of connective tissue in chorion layer.Media layer tickness was declined due to elastic fibersand fibrosis. Endothelial damage and thrombosis made arterial lumen narrowing and disruption.

Discuttion: The damages in test group, which had exposure to lead-acetate, suggests destructive effects of lead on endothelial cells and other layers of

arteries.This shows a correlation between lead pollution and cardiovascular diseases.

Key words: Lead-acetate, Artery, Aorta, Rabbit

noorimoo@sina.tums.ac.ir

Challenges of active and smart packaging synthesized with nanomaterials

Sepideh Hadavifar[1], Milad Tavassoli[1*]

1 Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background: One of the main goals of new food packaging technologies, in addition to maintaining product quality and food safety, is to consider environmental issues. Therefore, the use of smart and active packaging synthesized with environmentally compatible nanomaterials is proposed as an effective solution for food packaging. However, this type of packaging faces challenges related to the use of nanoscale materials in the food packaging sector, which must be carefully evaluated and different methods to reduce these challenges must be carefully examined.

Methods: Three databases (ISI Web of Science, Google Scholar, Scopus) using specific keywords ("nanoparticles", "active and intelligent packaging", "active and intelligent packaging challenges", "environmental issues in packaging ", "food safety" were searched).

Finding: After the reviews were conducted according to the keywords, a large number of studies were found, and about 47,000 similar articles were found, some of which met the inclusion criteria and were evaluated.

Discussion: The significant rise in plastic production and usage, coupled with the ecological threats posed by microplastics, has resulted in environmental pollution, biodiversity loss, and posed risks to human health. Consequently, there has been a growing interest among researchers and manufacturers in developing smart and biodegradable packaging materials utilizing nanotechnology. Nanomaterials are primarily categorized into two groups: those sourced from organic materials and those with a mineral origin. Organic-derived nanomaterials employed in nanofood packaging are regarded for their sustainability and eco-friendly characteristics. Studies have demonstrated that nanomaterials derived from organic compounds actively enhance the mechanical strength, barrier properties, and antimicrobial efficacy of packaging materials. Organic materials used in nano-scale packaging have the ability to create a protective barrier against the external environment and increase the useful life of fresh foods. Despite the progress made in nanofood packaging, there are still several research gaps that require attention. First, extensive studies should be conducted to evaluate the long-term effects of NPs migration from packaging to food products. Potential toxicity and bioaccumulation of these nanoparticles are important to ensure consumer safety. In addition, the lack of standardized testing methods and regulatory frameworks creates challenges in fully assessing the safety of nanomaterials used in food packaging.

Conclusion: Smart and active food packaging is a growing trend in the research community. The use of nanoparticles in this packaging can provide advantages of mechanical, thermal and gas barrier

properties. But in the commercial development of this packaging, factors such as product price, health, and nanoparticle release properties should be considered.

Keywords: Nanomaterials, Smart packaging, Active packaging, Migration

* Milad Tavassoli

Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

mtavassoli2006@gmail.com

An overview on the aspects of safety, quality and formulation of infant food

Nooshin Noshirvani[1]

Food Science and Technology, Tuyserkan faculty of Engineering and Natural Resources, Bu Ali Sina University, Hamedan, Iran

Background: Infant food formulation is special for products that are designed and prepared for children from 0 to 12 months. Children's food has a special place among the production of food products, the reason of which is mainly related to its nutritional aspects and preparation methods. Aspects of quality and microbial safety of infant and children's food are a priority for producers, legal authorities and consumers. Infant food belongs to a very sensitive group of the population, which is most susceptible to foodborne diseases compared to other age groups. The purpose of this review article is to investigate the composition and interactions between the main components of baby food and its effects on the nutritional quality of infant food and to investigate how to maintain the safety of the product with the aim of reducing the potential risks that threaten the safety of the product.

Methods: Preventive measures during the production and commercialization of these products are carried out by applying the principles of the critical risk analysis system of control points and good production methods in order to ensure safety and quality. Otherwise, the microbial risks of infant food are still considered a threat to public health. For this purpose, the analysis of potential chemical, biological and physical risks is done in different stages from the raw material to the final product. In this review article, the main dangers threatening the safety of baby food and ways to control it are mentioned. The formulation of baby food and effective ingredients in its production are also mentioned.

Results: A significant increase in the income from the sale of infant food can be expected in the near future. Therefore, the formulation, preparation and storage of infant food in order to maintain the nutritional value, physicochemical properties and safety of the product is of great importance. The presence of pathogenic microorganisms, microbial metabolites, microbial and fungal toxins, aflatoxins, harmful chemical compounds are part of the dangerous compounds in the production of infant food, and the control of raw materials, production and maintenance stages in reducing and eliminating risks is very effective. Lactose crystallization, Maillard reaction, oxidation and

interactions between micronutrients and other compounds are the most important aspects of infant food preparation and storage. These interactions and reactions are effective on physical characteristics such as powder flowability, solubility and other functional characteristics. It is necessary to control the storage conditions such as temperature, humidity and the amount of oxygen in the headspace of the product in order to maintain the quality of baby food.

Conclusion: Contamination of infant's food is possible through various sources such as the environment, production processes, raw material and contact with other materials. In this article, a major part of the main pollutants of baby food, and the strategies to reduce and eliminate it by applying HACCP standards and GMP principles in different production lines are mentioned.

Keywords*:* foodborne diseases, aflatoxin, polycyclic aromatic hydrocarbons, critical hazard analysis system, Maillard reaction, oxidation

*Corresponding Author: Nooshin Noshirvani

n.noshirvani@basu.ac.ir

Natural polymers as potential carriers for controlled release of bioactive compounds in food preservation

Reza Ghadermazi[1,*], Mojtaba Azizi[2]

1 Department of Food Science and Technology, Faculty of Agriculture, Urmia University, Urmia, Iran

2 Department of Nutrition and Food Sciences, Isfahan University of Medical Sciences, Isfahan, Iran

Efficient methods for preserving food are crucial for maintaining the quality and safety of perishable items. The food industry has been investigating the utilization of natural polymers as carriers for the controlled release of bioactive substances in food preservation to prolong the shelf life of food products. These natural polymers, derived from sources like plants, animals, and microorganisms, offer distinct advantages such as being biocompatible, biodegradable, and having low toxicity, making them an appealing choice for food preservation. These polymers can be customized to suit the specific requirements of various food items and can be employed to encapsulate bioactive substances like antioxidants, antimicrobials, and flavorings. Various encapsulation methods for natural polymers exist, including spray drying, coacervation, and electrospinning. By releasing the encapsulated bioactive substances in a controlled manner, the preservation process can be effective without compromising the quality and safety of the food. The applications of natural polymers in food preservation are extensive, spanning from meat and dairy products to fruits and vegetables. These polymers can enhance traditional preservation techniques like refrigeration, freezing, and canning, and can also serve as a standalone preservation approach. The future outlook for natural polymers in food preservation is promising, with researchers actively exploring innovative methods to leverage their capabilities. Through harnessing the advantages of natural polymers, researchers

and food technologists aim to develop sustainable and efficient preservation techniques that meet the requirements of the food industry.

Keywords*:* natural polymers, shelf life, bioactive substances, controlled release, food preservation

*Corresponding Author: Reza Ghadermazi Affiliation and Email Address: Department of Food Science and Technology, Faculty of Agriculture, Urmia University, Urmia, Iran

ghadermarzy@gmail.com

Nano lipid carriers for essential oil encapsulation

Leila Rafiei[1*], Mahdi Yaghchian[2,] Golnaz Bahriyeh[1], Mahsa Darkak[3]

1. Department of food science and technology, Urmia University

2. Department of Geriatric Health, Tabriz University of Medical Sciences, Tabriz, Iran

3. Department of food science and technology, Islamic Azad University, Tabriz branch

Background: Essential oils (EO) extracted from aromatic spices (e.g., cinnamon,thyme, oregano, and clove) have beneficial, healthy, and nutritional effects. They can inhibit fungal, insecticidal, microbial, and oxidative activities. In addition, they can improve the shelf life of foods. Thus, they can be considered for use as food preservatives. Microencapsulation technology has been used to protect and increase core materials such as EO for use in food technology. The lipid-based colloidal delivery system for the encapsulation of bioactive ingredients such as emulsions, solid lipid nanoparticles (SLN), NLC, and vehicular carriers (e.g., liposome, phytosome, and noisome) are used in the pharmaceutical, cosmetic, and food industries. In comparison to the other carriers, NLC has some advantages, such as their production from natural food ingredients, the absence of organic solvents in their preparation, the presence of solid lipids causing high colloidal stability and a density closer to that of water, high chemical stability due to both higher resistance of solid lipid to oxidation and lower mobility of core material in the matrix, high encapsulation efficiency due to the presence of both liquid and solid phases, high

bioavailability, the controlled release of encapsulated bioactive, and suitability for scaling-up production. NLC can also overcome some defects of SLN, such as comparatively low bioactive

loading capacity and potential core material (encapsulate) loss. The presence of liquid lipids in NLC can disturb the highly ordered structure of solid lipids, resulting in an imperfect crystal structure and higher bioactive material loading.

Discussion: Nowadays, based on original research and studies of the physicochemical properties of different nanolipid carriers, nanolipid carriers can encapsulate essential oils with high encapsulation efficiency. Also, this strategy is a useful strategy for the encapsulation of essential oil.

Keywords*:* essential oil, Nano lipid carrier, encapsulation

*Corresponding Author Leila Rafiei

Leila rafiei199@yahoo.com

Investigation of different green processes on digestibility and bioavailability of plant-based meat analogues

Zahra Salehi[1], Hoda Samari[1], Atefe Rezaei [2*]

1 Student Research Committee, Department of Food Science and Technology, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran

2 Department of Food Science and Technology, School of Nutrition and Food Science, Nutrition and Food Security Research Center, Isfahan University of Medical Sciences, P.O. Box: 81746-73461, Isfahan, Iran

Background: Due to the high potential of plant-based proteins (PBPs) in the formulation of meat analogues, it has been considered globally to enhance the functional and nutritional properties of PBPs. These products are created to address the environmental, health and animal welfare concerns associated with the current limited meat production system. However, there are some limitations related to the application of PBPs that can be addressed using different protein modification methods.

Methods: It has been searched in international databases such as PubMed, Scopus, Cochrane Embase from 2016 to 2023.

Results: Studies show that plant proteins have a lower digestibility (75-80%) compared to animal proteins (90-95%), which is attributed to the existence of anti-nutritional factors, indigestible cell walls and specific protein structures in plants. It has been indicated that the digestibility and bioavailability of PBPs can be enhanced using various physical, chemical, and biological methods, such as high-pressure processing (HPP), sonication, microwave, and electric field (EF) technologies, as well as enzymatic hydrolysis and fermentation.

Discussion: Consuming plant-based foods reduces the risk of obesity, the risk of type 2 diabetes, and cardiovascular diseases. Some plants may contain anti-nutritional agents that inhibit protein digestion or absorption, or they may contain indigestible substances that reduce the ability of digestive enzymes to reach proteins. The digestibility of proteins in plant-based meat analogues is slower than that of real meat in the intestinal phase different physical, chemical, and biological methods can be used to improve the Digestibility and bioavailability of plant-based proteins.

Keywords*:* Meat analogues, Plant-based proteins, Digestibility, Bioavailability, Green technologies, Sustainable proteins

*Corresponding Author : Atefe rezaei Institutional affiliation: 2 Department of Food Science and Technology, School of Nutrition and Food Science, Nutrition and Food Security Research Center, Isfahan University of Medical Sciences

atefe.rezaei@nutr.mui.ac.ir

Modification of vegetable proteins by ultrasound and microwave methods

Hoda sameri[1], , Zahra salehi, and, Atefe rezaei[2*]

1 Student Research Committee, Department of Food Science and Technology, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran

2 Department of Food Science and Technology, School of Nutrition and Food Science, Nutrition and Food Security Research Center, Isfahan University of Medical Sciences, P.O. Box: 81746-73461, Isfahan, Iran

Vegetable proteins have higher health benefits than animal proteins, such as lowering the glycemic index, heart health, satiety, weight management, and maintaining muscles. Plant proteins are considered nutritionally inadequate due to their deficiency in some essential amino acids. For example, cereal proteins lack lysine and legume protein lack methionine. Also, vegetable proteins are less bioavailable in terms of digestion and digestibility compared to animal proteins.Therefore, modification of plant proteins using appropriate technology to improve quality, performance, digestibility and bioavailability seems necessary compared to plant proteins. Among these techniques are ultrasound and microwave. Ultrasound changes the structure of proteins and increases digestibility and bioavailability. The mechanism of this effect on plant proteins is through the microbubble cavity of high-intensity oscillating pressure waves. The use of high-intensity 20 kHz ultrasonic waves changes the protein structure and increases digestibility. The use of microwave technology deactivates protease and trypsin inhibitors and increases digestibility. Microwave waves have a positive effect on protein secondary structure, water holding capacity, and emulsification. Due to the increase of vegetable proteins in the diet plan, it should be possible to use this type of protein.

Therefore, using the right techniques and increasing functional and technical properties and increasing bioavailability is an effective way to achieve this.

Keywords*:* Vegetable protein1, ultrasound2, Microwave3, digestibility4

Corresponding author: hoda sameri

samerihoda@yahoo.com

Current Trends in Pesticide Use: Side Effects on Agriculture, Ecosystem and Human Health

Soheila Aminzadeh[1,2]* Maryam Salehcheh [1,2,] Mohammad Javad Khodayar [1,2]

1 Toxicology Research Center, Medical Basic Sciences Research Institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

2 Department of Toxicology, Faculty of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Abstract: Pesticides play a crucial role in agricultural production. Agricultural productivity is often increased through the application of heavy doses of pesticides and fertilizers. However, such practices can result in poor soil health and ecological destruction. Excessive use of pesticides may cause toxicity in crops, leading to

chronic toxicity in living organisms. The organochlorine pesticides can persist in crops for extended periods and dramatically alter the soil pH, reducing its fertility. While organophosphate and carbamate families of pesticides persist for a much shorter time, hence these have replaced organochlorine pesticides. Consumption of pesticide-contaminated food materials may lead to toxicity in human beings. Pesticides are considered one of the top environmental toxicants, causing serious threats to human health and agricultural production. Chemical residues that emanate from the intended target plants tend to disperse beyond their intended areas, leading to environmental pollution. This type of pollution can ultimately contribute to negative health effects through the contamination of both food and the environment. It is crucial to address this issue to ensure the safety of both the ecosystem and human welfare. This study aims to investigate the adverse effects of pesticides on the agricultural ecosystem, food chain, and human health. Moreover, it emphasizes the bioaccumulation, and transmission pathways of pesticides. In summary, this article highlights the hazardous effects of excessive use of pesticides on crops and human health and the need for sustainable agricultural practices.

Keywords: Pesticides, Crop, Agriculture, Ecosystem, Food Chain, Human Health

*Corresponding author: Soheila Aminzadeh, Toxicology Research Center, Medical Basic Sciences Research Institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Department of Toxicology, Faculty of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

soheila.az.60@gmail.com

Application of Synthetic Food Color Additives: Downsides and Future Direction

Soheila Aminzadeh[1,2]* Maryam Salehcheh [1,2,] Mohammad Javad Khodayar [1,2]

1 Toxicology Research Center, Medical Basic Sciences Research Institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

2 Department of Toxicology, Faculty of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Abstract: Color is an essential sensory attribute that significantly impacts consumer preferences and food choices. In the food industry, food color additives are commonly used to restore and enhance color during processing and storage, but they provide no nutritional or health benefits. Synthetic azo dyes, such as Azorubine, Ponceau, and Tartrazine, are the most commonly used colorants that are added to food products to improve their color. The food industry favors synthetic azo dyes over natural colorants due to their affordability, stability, and ability to intensify color without imparting unwanted flavors. However, the use of synthetic azo dyes has been associated with several adverse effects and toxicities including cytotoxicity, genotoxicity, and apoptoxicity both in the short and long term. Consumption of azo compounds can result in the breakdown of these compounds by intestinal and skin microbiota. The reduction of the azo bond in an azo compound leads to the production of aromatic amine metabolites, which can have toxic consequences as many aromatic

amines such as benzidine and p-phenylenediamine which are carcinogens and allergens, respectively. This review study aimed to provide an overview of our understanding of the toxicology of azo dyes. Moreover, we discuss the future direction of introducing alternatives to overcome concerns regarding the use of azo dyes.

Keywords: Synthetic Food Color Additives, Azo Dye, Toxic Effects, Food Industry

*Corresponding author: Soheila Aminzadeh, Toxicology Research Center, Medical Basic Sciences Research Institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Department of Toxicology, Faculty of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

soheila.az.60@gmail.com

Berberine can reduce colorectal carcinogenesis by improving intestinal microbiota

Maedeh Aliakbari[1], Mohammad Alikhah[2,*] Mehdi Arjmand[3], Arash Seraj zade[4]

1,2,3,4 student research committee, Jondishapur University of medicinal science, Ahvaz, Iran

Background: Colorectal cancer (CRC) is a prevalent malignant tumor in which gut microbiota dysbiosis plays an essential role in its development and progression. The increasing role of intestinal flora in CRC may represent a new approach to improving its treatment. Berberine, a botanical benzylisoquinoline alkaloid, may target intestinal flora due to its low oral absorption into the blood, potentially inhibiting the occurrence of CRC. This study aims to investigate the effect of berberine consumption on intestinal microbiota dysbiosis and colorectal tumorigenesis.

Methods: This review study analyzed articles from databases including ScienceDirect, PubMed, Scopus, and the Google Scholar search engine, using keywords "Berberine", "Colorectal cancer", and "Gut microbiota" from 2020 to 2024. After the initial search, the title and abstract were examined for relevance to the study's objectives, and irrelevant articles were removed. Finally, 6 articles were extracted and reviewed.

Results: 16S rRNA sequence analysis indicated that berberine decreased the β-diversity of gut microbiota in CRC mice without influencing α-diversity. It also enriched probiotic microbes such as Akkermansia and Parabacteroides in HFD-fed CRC mice, depleted cancer-related bacteria including f_Erysipelotrichaceae, Alistipes, Actinobacteria, and Verrucomicrobia, it modulated the functionality of gut microbiota in CRC mice. Additionally, berberine administration increased the ratio of Firmicutes/Bacteroidetes (F: M). Berberine might inhibit V. parvula, which is increased through the development of CRC (P=0.0016). Gavage with Lactobacillus rhamnosus could improve the anti-tumor effect of berberine.

Discussion: Based on the results, modulation of intestinal microbiota dysbiosis by berberine can be a promising therapeutic strategy for the prevention and clinical treatment of colorectal cancer, including colorectal cancer associated with a Western diet.

Keywords*:* berberine, colorectal cancer, GUT microbiota

* Mohammad Alikhah student research committee, Jondishapur University of medicinal science, Ahvaz, Iran

nimaalikhah@gmail.com

Effect of Epigallocatechin gallate on progression of Alzheimer's disease: a systematic review

Mohammad Alikhah[1], Maedeh Aliakbari[2], Mehdi Arjmand[3], Arash Seraj zadeh[4]

1,2,3,4 Student research committee, Jondishapur University of medical science, Ahvaz, Iran

Background: Alzheimer's disease(AD) is an age-related neurodegenerative disease that is the most prevalent source of dementia in the elderly. Alzheimer's is caused by the accumulation of toxic amyloid-β(Aβ) plaques and hyperphosphorylated tau. Epigallocatechin gallate (EGCG), a component of green tea, has shown promise in the prevention and treatment of neurodegenerative disorders. EGCG has been found to have antioxidant and anti-inflammatory abilities, which can help modulate AD progression.

Methods: This review study, by analyzing articles from databases including ScienceDirect, Pubmed, Scopus, and Google Scholar search engine and using keywords "Epigallocatechin gallate", "Alzheimer's disease" and "amyloid-β", from 2020 to 2024 is done. After the initial search, the title and abstract were examined in terms of relevance to the objectives of the study, and irrelevant articles were removed. Finally, 3 articles were extracted and reviewed.

Results: It was observed that EGCG induces Aβ clearance by microglia through the blockade of the HDAC6-PI3K/AKT/mTOR pathway and subsequent activation of autophagy. Additionally, EGCG suppressed the expression and activity of β-site amyloid precursor protein-cleaving enzyme 1 (BACE1) and the expression of Aβ1-42 .EGCG decreased the hyperphosphorylation of the Tau protein in the hippocampus. Oral administration of EGCG (50 mg/kg) for 4 months reduced aβ plaques in the hippocampus of 6-month-old in APP/PS1 transgenic mice, which served as an AD model.

Discussion: Based on the results, EGCG can reduce the risk factors of AD and reduce its incidence, as well as decelerate the progression of AD.Therefore, it seems a diet rich in EGCG or its supplement could prevent AD.

Keywords: Epigallocatechin gallate, Alzheimer's disease, amyloid-β

* Maedeh Aliakbari

Student research committee, Jondishapur University of medical science, Ahvaz, Iran

Maedehaliakbari01@gmail.com

Detection diarrheagenic *Escherichia coli* pathotypes from raw milk and unpasteurized buttermilk by culture and multiplex polymerase chain reaction in southwest Iran

Effat Abbasi Montazeri*1,2 , Amanollah Zarei Ahmady, Mansour Amin, Raziyeh Aliyan Aliabadi, Abdoghani Ameri

1.Department of Microbiology, Faculty of Medicine, Ahvaz Jundishapur University of Medical
Sciences, Ahvaz, Iran.

2.Infectious and Tropical Diseases Research Center, Health Research Institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Background: In developing countries including Iran, there are limited data on diarrheagenic Escherichia coli (DEC) contamination in milk and unpasteurized buttermilks. This study aimed to determine the occurrence of DEC pathotypes by culture and multiplex polymerase chain reaction (M-PCR) in some dairy products from southwest Iran.

Methods and results: In this cross-sectional study (September to October 2021), 197 samples (87 unpasteurized buttermilk and 110 raw cow milk) were collected from dairy stores of Ahvaz, southwest Iran. The presumptive E. coli isolates were primarily identified using biochemical tests and then confirmed by PCR of uidA gene. The occurrence of 5 DEC pathotypes: enterotoxigenic E. coli (ETEC), enterohemorrhagic E. coli (EHEC), enteropathogenic *E. coli* (EPEC), enteroaggregative *E. coli* (EAEC), and enteroinvasive *E. coli* (EIEC) were investigated using M-PCR. Overall, 76 (76/197, 38.6%) presumptive *E. coli* isolates were identified by biochemical tests. Using *uidA* gene, only 50 isolates (50/76, 65.8%) were confirmed as *E. coli*. DEC pathotypes were detected in 27 of 50 (54.0%) *E. coli* isolates (74.1%, 20/27 from raw cow milk and 25.9%, 7/27 from unpasteurized buttermilk). The frequency of DEC pathotypes was as follows: 1 (3.7%) EAEC, 2 (7.4%) EHEC, 4 (14.8%) EPEC, 6 (22.2%) ETEC, and 14 (51.9%) EIEC. However, 23 (46.0%) *E. coli* isolates had only the *uidA* gene and were not considered DEC pathotypes.

Conclusion: Possible health risks for Iranian consumers can be attributed to the presence of DEC pathotypes in dairy products. Hence, serious control and prevention efforts are needed to stop the spread of these pathogens

---

Application of deep eutectic solvents in food industry: Fabrications, developments and future prospective

Nastaran Jahani[1], Milad Tavasoli[2,*]

2 Department of Food Science and Technology, Faculty of Nutrition and Food Science, Tabriz University of Medical Sciences, Tabriz, Iran

Background: Deep eutectic solvents are new solvents with physical, chemical, organic and environmentally friendly properties that have replaced conventional organic solvents and have recently received attention due to their advantages such as availability and non-toxicity, cheapness and easy preparation. Considering the safety risks, endangering the environment and the high cost of conventional organic solvents and the advantages mentioned for deep eutectic solvents as an alternative method is investigated**.**

Methods: In order to review the use of deep eutectic solvents in the food industry: manufacturing, developments, and prospective, keywords include "deep eutectic solvents", Food, "food industry" were searched in databases Scopus ، PubMed ،Web of Science ،Google Scholar and the articles available in the period from 2015 to 2024 were reviewed.

Results: After reviewing the related articles, the use of deep eutectic solvents in food industry: production, developments and prospective was investigated and its use in the extraction of organic compounds obtained from by-products of food industry was determined.

Discussion: Based on the studies, deep eutectic solvents can be used in the extraction and separation of heavy metals, antibiotics, aflatoxins, artificial colors, phenolic compounds, flavonoids, sugars, aromatic amines and proteins from food samples. Therefore, considering its valuable properties in the separation of harmful organic substances in the food industry, as well as the cheapness and availability of this material, it is recommended to use it instead of ordinary organic solvents.

Keywords*:* Deep eutectic solvents, Food, organic, usage

* Milad Tavassoli Department of Food Science and Technology, Faculty of Nutrition and Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

mtavassoli2006@gmail.com.

Quick Evaluation of The Burger Shrinkage Using a Machine Vision System

Mehran Nouri[1*], Saeid Soheily Nia[1], Mohammad Taghi Moghanian[1], Shadi Afsaneh[1]

1 R&D Department of 202 food industries, Dr Hesabi St, Karaj Qazvin highway, Karaj, Iran

Background: The shrinkage of hamburger is one of the quality characteristics of the product that affects the final acceptance of the consumer. recently, machine vision technology has been successfully used for the quality assessment of food and agriculture. Therefore, in this study, burger shrinkage was determined using a computer vision system.

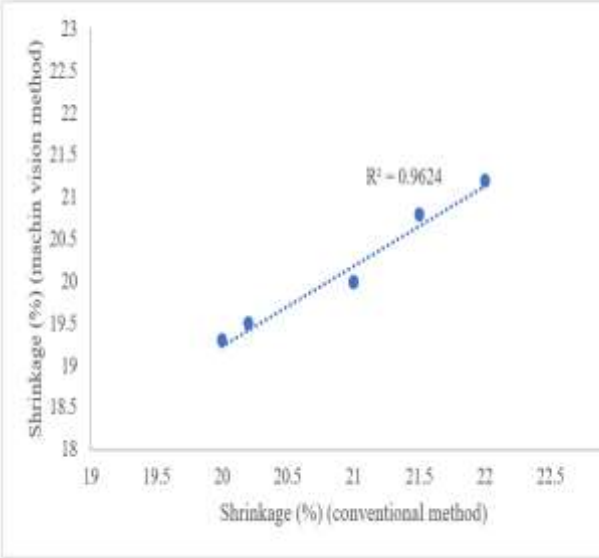
Methods: To evaluate burger shrinkage an image analysis system was used. A photo (24-bit) was taken of each sample before and after cooking. The area of the burgers before and after cooking was calculated in terms of pixels, and the shrinkage was measured using equation (1).

$$\text{Burger shrinkage } \% = \frac{S1-S2}{S1} \times 100 \quad (1)$$

To determine the shrinkage through the conventional method, the diameter of the burgers was calculated using a ruler. The shrinkage was determined using equation (1). The relationships between variables were tested using Pearson's correlation coefficient test

Results: The results and the correlation between the data obtained for the burger shrinkage, through conventional and machine vision, are shown in Figure 1.

Figure 1. Correlation between the values of hamburger shrinkage, calculated through the conventional method and a machine vision system.



Discussion: Burgers shrinkage during cooking due to protein denaturation and cooking loss. In this study, the positive correlation between the amount of burger shrinkage determined using the conventional method and the machine vision method was shown.

Keywords: Burger quality, Visual assessment, Image processing

*MehranNouri
R&D Department of 202 food industries, Dr Hesabi St, Karah Qazvin highway, Karaj, Iran

mnouri1366@gmail.com

Applications of Antimicrobial Nanocarriers in Food Shelf-life Improving

Mehran Nouri[1*], Saeid Soheily Nia[1], Mohammad Taghi Moghanian[1], Shadi Afsaneh[1]

1 R&D Department of 202 food industries, Dr Hesabi St, Karaj Qazvin highway, Karaj, Iran

Background: Antimicrobial substances are bioactive compounds that inhibit the growth of microorganisms which cause spoilage in food. With time, the stability of these bioactive compounds will decrease and result in degradation and loss of antimicrobial activity. Nanoencapsulation protects antimicrobial agents from unfavourable environmental conditions. Encapsulation of antimicrobial natural compounds, control delivery of compounds that are encapsulated, increasing the concentration of the antimicrobials in specific areas and improving passive cellular absorption mechanisms.

Methods: In this review study, the latest articles published in reputable international publications, including Elsevier and Wiley Online publications, are reviewed and a summary of these materials is presented.

Results: In this study, nanoemulsions, nanoparticles, nanoliposomes and nanofibers are discussed.

Discussion: Nanoemulsions are stable colloidal systems with nano-size particles; which are prepared by dispersing one liquid in another insoluble liquid. Compared to microemulsions, nanoemulsions are more transparent and have better stability. The term nanoparticles are used for nanospheres and nanocapsules. A nanosphere is a polymer matrix that active compounds can be absorbed on its surface or encapsulated inside. A nanocapsule is a systemic vesicle in which the active compound is locked in its liquid core. Nanoliposomes are nano-scale walled core structures, in which the hydrophobic hydrocarbon sequences of phospholipids participate in the formation of a bilayer wall, in such a way that the polar heads of these phospholipids are exposed from all sides. Nanofibers are ultrafine structures with particle diameters less than 100 nm that are often produced by electrospinning.

Keywords*:* Antimicrobial Nanoparticles, Nanoemulsions, Nanoparticles Nanoliposomes

*MehranNouri
R&D Department of 202 food industries, Dr Hesabi St, Karah Qazvin highway, Karaj, Iran

mnouri1366@gmail.com

Evaluation the properties and application of date by-products and waste

kowsar kakaei[1] and Ghazal Mehrad[2]

1.Ph.D.student Department of food Science and Tecnology , AgriculturalScience and Natural Resources Univercity of Khuzestan

2.Ph.D student,food science and Tecnology, Sari Agricultural Science and Natural Resources Univercity, Sari,Iran

Background: The palm tree is one of the oldest and most sacred plants, whose name is repeated 24 times in the Holy Quran, and Muslims consider it one of the heavenly fruits. Dates are an old fruit, a fruit that comes from a tree that belongs to the palm family and is grown in subtropical and tropical regions. Considering the high number of date production in the country and the lack of proper productivity, significant waste is obtained from it. Therefore, using these wastes properly and properly is important and necessary according to their properties and applications. This article describes the nutritional and medicinal properties as well as the uses of date waste, which includes the kernel, shell, and extract of the date kernel. In addition to the food industry, date waste is used in most industries such as textile and medicine, which is due to the significant medicinal, nutritional and functional properties of date products and waste. The effect of dates on health has been investigated in several studies. Because dates are classified in the group of fruits that have the benefits of consuming fruits and vegetables. In addition, dates are considered a low-fat food due to their low fat content. Also, considering the antimicrobial properties of date by-

products, more research is needed in this field.

Conclusion: Considering the high statistics of date waste production, we should reduce this waste by using the correct methods of date production and its products. At the same time, to use production waste in a favorable way in the production of value-added products. The findings of this study showed that dates, in addition to being very energy-producing, due to having several compounds that have antioxidant and phenolic properties and also compounds such as carbohydrates, fatty acids, mineral compounds, vitamins and fiber, can be used in the treatment of many diseases. heart, cancer, diabetes, be effective. Also, according to the properties and application of date kernel, powder and extract, which are obtained from the waste and processing of date fruit, they can be used in various industries. Date kernel has a great impact on the pharmaceutical and economic industry. Among other things, several types of oil can be extracted from it. Of course, the full identification of compounds with antioxidant, hormonal and antimicrobial properties in date kernels, which have been reported by various researchers, needs more research, while its consumption should not be excessive, because its very high consumption causes damage to the liver and spleen. Blood pressure and mouth ulcers and tooth decay.

Keywords*:* Dates, date waste, medicinal and practical properties

*Corresponding Author: kowsar kakaei

kowsarkakaei@gmail.com

Extraction methods of phycocyanin from spirulina microalgae

Ghazal Mehrad1and kowsarkakaei2

1.Ph.Dstudent,foodscience and Tecnology, Sari Agricultural Science and Natural Resources Univercity, Sari,Iran

2.Ph.D.studentDepartment of food Science and Tecnology, Agricultural Scienceand Natural Resources Univercityof Khuzestan

Background: Biotechnology is the science of using natural systems and living organisms to make mutated products or processes.Food biotechnology is arelatively new and developing science of molecular biology that has been developing for the past 30 years with the formation of the rstre combinant gene .Biotechnology can be use dchange raw food materials such as milk, meat, vegetables, and grains into products with a good taste and aroma and more storage capacity .The production of the setypes of products in the world has a very long history and now the se products are produced on an industrial scale. Microalgae biotechnology is arelatively new *eld of research that has grow nexponentially in the last few years along side microalgae-basedproducts.This*eld generally includes eukaryotic microalgae and prokaryotic cyanobacteria.

Reasons for using microalgae

Source of carbon, polysaccharides, lipids, proteins, vitamins and antioxidants, betacarotene, astaxanthin, pigments and extracts of algaeassalable sources, extra ctingchlorophyllfrommarinemicroalgae,
has a lltheessential aminoacids that

Manisnotabletocreate the minhisbody. Algaespeciesareclassified into two categories: macroalgaeandmicroalgae.

C-phycocyaninphycocyanin

Fro mcyanobacteria,(C-PC),ablueandwater-solublepigment, is known. Inaddition to being use dasapigment in the formulation of food products, interestinCPC has increased due to its antioxidant and anticancer activities.

Fourmainparametersaffectingphycocyaninextraction: Temperature:Anincreaseinextractionefficiency with temperature from 30to.50Canda further decreaseinC-PCconcentration athigher temperatures have been reported.

pH:directly affects the solubility of C-PC due to the in+uenceof the ionic strength of the solvent on the protein structure.

Biomass to solvent ratio: The higher the biomass to solvent ratio, the higher the extraction efficiency.

Biomass form/condition: Dry biomass is generally used for C-PC extraction, and few studies have been performed with fresh biomass.

Keywords: Extraction, phycocyanin, spirulina

*Corresponding Author: Ghazal Mehrad

gh.mehrad17@gmail.com

The effect of ketogenic diet to control fatty liver in people with liver cirrhosis, a systematic study

Arash Serajzadeh zadeh

1. Student research committee, Jondishapur University of medical science, Ahvaz, Iran

Background: Ketogenic diet (KD), also known as low-carb diet, may play an effective role in reducing liver fat and treating liver cirrhosis. By collecting and analyzing the available data, this article seeks to provide evidence for the beneficial role of this diet in controlling and reducing liver fat. Methods: Methodology: Systematic review study, selection of 8 articles out of 60 reviewed articles without time limit, data in English, including clinical trial articles and meta-analysis, was done by searching PubMed, Google Scholar databases. Results: In a clinical study conducted with the presence of 5 people with cirrhosis, it was found that 4 out of 5 people improved their disease and lost 12.8 kg in weight. In another study, the (KD) shows the effect of reducing weight and liver fat and is very useful for controlling liver cirrhosis and its complications. Also, this diet is associated with increased esterified fatty acids, decreased insulin resistance and nonalcoholic fatty liver disease) NAFLD (. Studies have shown that this diet causes a 3% reduction in body weight and a 58% reduction in hepatic insulin resistance. Also, this diet increases the concentration of intrahepatic triglycerides) IHTG (and leads to a 31% decrease in nonesterified fatty acids. The result of these changes is the division of acids resulting from ketogenesis due to the decrease in serum insulin concentration and hepatic citrate synthase flux. Discussion: The data thus far suggest that KD provides the basis for reversal of NAFLD: that is, hepatic mitochondrial flux and redox state are significantly altered to promote ketogenesis rather than IHTG synthesis.

*Corresponding Author: Arash Serajzadeh zadeh

arash.iran91@gmail.com

Investigating the effect of synbiotic supplementation on the control of Alzheimer's disease: a systematic review

Arash Serajzadeh zadeh

1. Student research committee, Jondishapur University of medical science, Ahvaz, Iran

Background: Alzheimer's disease is a type of neurological disease that causes cognitive disorders. Considering. Considering the effect of the microbiome on the nervous system, it is expected that the use of synbiotic supplements can play a role in controlling Alzheimer's disease. Methods: This review study, by analyzing articles from databases including Science Direct, PubMed, Scopus and Google Scholar search engine and using keywords "Alzheimer", "Microbiome", "Synbiotic", is done. After the initial search, the title and abstract were examined in terms of relevance to the objectives of the study, and irrelevant articles were removed. About 20 studies were reviewed and finally 6 studies were included in this review. Results: Various articles refer to the role of synbiotic in Alzheimer's disease. In a meta-analysis study with a sample size of 386 people, the treatment of microbial flora balance through probiotics improved cognitive function in Alzheimer's patients. In another study, by examining 12 patients, it was determined that the gut microbiome can have a positive and negative effect on the course of the disease. In another meta-analysis study with a statistical population of 672 patients, it was found that supplement consumption is effective in controlling the disorder by affecting the immune system and metabolites. Discussion: Based on the data obtained from articles, the consumption of synbiotic supplements has a role in Alzheimer's by affecting the brain-intestinal pathway. Microbiome controls the disease by producing pro-inflammatory cytokines, metabolites and changing the permeability of the blood-brain barrier. However, in order to discover the appropriate response dose in order to treat the disease, additional studies should be conducted.

*Corresponding Author: Arash Serajzadeh zadeh

arash.iran91@gmail.com

A review of some medical and nutritional properties of blueberries

Ahmad Taghi[1], Ameneh Ozhand[2], Farzaneh Iranpak[3], Kivan Manoochehripour[4]

1 Bachelor of Nutrition Sciences, Sarvestan Islamic Azad University, Affiliation: food and drug administration of ahvaz jundishapur university

2 Master's degree in physical chemistry, ahvaz Shahid Chamran University, Affiliation: food and drug administration of ahvaz jundishapur university

3 Master's degree in food industry technology engineering, Tehran University of Science and Research (Khuzestan), Affiliation: food and drug administration of ahvaz jundishapur university

4 Master's degree in physical chemistry, Tehran University of Science and Research (Khuzestan), Affiliation: food and drug administration of ahvaz jundishapur university

Background:Blueberry is one of the most nutritious fruits, which has attracted the attention of many health researchers due to its medical and nutritional properties. Recent research shows that blueberry consumption can be effective for cardiovascular health, inflammation control, oxidative stress, type 2 diabetes contol, and intestinal health And it has antioxidant and anti-inflammatory properties. In addition, blueberries contain strong anthocyanins, which are known as natural antioxidants. These antioxidants can be effective in reducing the risk of cardiovascular diseases and preventing oxidative stress damage. Also, blueberry consumption can help improve cognitive function and mood and prevent some mental disorders. The fiber in it can help improve gut health and strengthen the digestive system. These nutritional properties of blueberry can make it a key component in a healthy diet and improving people's health.

Keywords: Blueberry , healthy diet , medical , nutritional

*Corresponding Author: Ahmad Taghi food and drug administration of ahvaz jundishapur university

prodiett@gmail.com

The use of Choir plant to increase the thermal stability of rapeseed oil and a natural alternative to the synthetic antioxidant TBHQ

Mona Shahrzad[1], Maryam Rashidian, Abolhassan Khalili

1.Department of food industry engineering, Kurdistan University of Science and Research, Islamic Azad University, Sanandaj, Iran

Abstract: Vegetable oils, especially rapeseed oil, are prone to oxidative spoilage due to high amounts of unsaturated fatty acids. The progress of oxidation of rapeseed oil enriched with 200-400 ppm Choir essential oil and a mixture of Choir essential oil and synthetic antioxidant and a mixture of Choir essential oil and synthetic antioxidant TBHQ 100 ppm+100 ppm (during 24 days of storage under accelerated conditions in temperature of 65 degrees Celsius) was investigated by measuring oxidation stability indicators and compared with synthetic antioxidant TBHQ. At the end of the storage period, the acidity, peroxide, para-anisidine and totox values for the control sample were 52.1 mg of potassium hydroxide per gram, 60.10 milliequivalents of oxygen per kg, 48.12 and 68.33, respectively. . By adding the essential oil of the aerial part of Choir with the minimum concentration of these numbers, the values of these numbers were 0.085 mg of potassium hydroxide per gram, 50.4 milliequivalents of oxygen per kg, 16.9 and 1, which compared to the synthetic antioxidant TBHQ, there is a significant difference. 5.0.05 by freezing method can delay the progress of rapeseed oil oxidation. Therefore, it can be used as a natural alternative to the synthetic antioxidant TBHQ.

Keywords: essential oil , accelerated storage, oxidative stability , Chovir , rapeseed oil

Shahrzadmona09@gmail.com

Theoretical study of the effect of extrusion process on bulked super-beneficial snacks based on powder (corn grits, date kernels, palm skin) with the natural color of phycocyanin extracted from spirulina microalgae

Ghazal Mehrad

1.Ph.Dstudent,foodscience and Tecnology, Sari Agricultural Science and Natural Resources Univercity, Sari,Iran

Background: Directly bulked corn snacks were the first type of industrial snack foods. The Adams Company first produced these types of snacks in the 1950s to 1990s from semolina particles using a single-screw extruder with a short shell length. This product is made for years before the precise understanding of the manufacturing process. It was in the 1970s and 1980s that the true nature of extrusion firing for direct bulking was determined by careful research. The statistics of the use of various snacks and prepared foods in today's societies is increasing day by day. Also, today, the effect of nutrition on improving health and reducing disease has become an important factor of interest for food designers, producers and consumers, and has led manufacturers to produce low-calorie and low-fat products. Replacing ready-to-eat breakfast cereals instead of traditional foods can reduce the amount of fat and, consequently, the amount of cholesterol in the blood of people. Accurate statistics on the production and consumption of bulk grains in different countries have not been provided, and there are many differences between countries and different regions of the world in terms of the consumption of these products, which is mainly due to differences in food culture and how advanced these countries are. Bulked products can be produced from most grains such as wheat, barley, rice, and corn, which are marketed in different forms such as flakes, flakes, or bulked whole grains. Among cereals, corn has the largest share of bulk products. The aim of this article is to investigate the theoretical investigation of the effect of the extrusion process on the useful bulked snack based on powder (corn grits, date kernels, palm skin) with the natural color of phycocyanin extracted from spirulina microalgae.

Keywords:extrusion,phycocyanin,snacks,food functional

*Corresponding Author: Ghazal Mehrad

gh.mehrad17@gmail.com

A review of the antimicrobial effect of graphene oxide in food packaging

Sahar sadat mirbagheri[1]

1. PhD Student, Department of Food Hygiene, Faculty of Veterinary, Ferdowsi University, Mashhad, Iran

Background: graphene oxide (GO) has gained significant attention due to its unique physicochemical properties and potential antimicrobial activity. GO is a two-dimensional monolayer of carbon atoms arranged in a hexagonal lattice, which can be functionalized with various groups, enhancing its solubility and stability in aqueous solutions. Recent studies have shown that GO exhibits antimicrobial properties against a wide range of microorganisms. The antibacterial activity of GO is attributed to its sharp edges, which can pierce and disrupt

bacterial cell membranes, leading to cell lysis and death. Additionally, GO can generate reactive oxygen species (ROS), which can damage bacterial DNA, proteins, and lipids, further enhancing its antimicrobial effect.In food applications, GO can be incorporated into food packaging materials to prevent microbial growth and extend the shelf life of food products. For instance, GO can be incorporated into polymer films, hydrogels, and nanofibers, providing a physical barrier against microbial contamination and releasing antimicrobial agents upon contact with microorganisms. Moreover, GO can be combined with other antimicrobial agents, such as essential oils and metal nanoparticles to enhance its antimicrobial efficacy and broaden its spectrum of activity. The combination of GO with other antimicrobial agents can also reduce the required concentration of each agent, minimizing the potential toxicity and improving the cost-effectiveness of the final product. In conclusion, the antimicrobial properties of graphene oxide offer a promising solution for food preservation and safety, providing a potential alternative to traditional chemical preservatives and physical methods.

Keywords: Graphene Oxide, Food Packaging, Antimicrobial Activity

---

Investigating the effect of coating with rosemary essential oil, whey protein concentrate and maltodextrin on the shelf life of tilapia fish during storage in the refrigerator

Sahar Sadat Mirbagheri[1*], Azade Salimi[2], Ashkan Jabali Jovan[3], Sara Mahdizadeh Mood[4]

1. PhD Student, Department of Food Hygiene, Faculty of Veterinary, Ferdowsi University, Mashhad, Iran

2. Assistant Professor, Department of Food Hygiene, Faculty of Veterinary, Semnan University, Semnan, Iran

3. Associate Professor, Department of Food Hygiene, Faculty of Veterinary, Semnan University, Semnan, Iran

4. Assistant Professor, Department of Food Hygiene, Faculty of Veterinary, Semnan University, Semnan

Background: fish, a valuable food source with a unique protein structure, high levels of polyunsaturated fatty acids, and a neutral pH.Our objective was to develop a coating that could slow down the spoilage process by using a combination of whey protein concentrate (10, 15, and 20% w/w), maltodextrin (15, 20, and 25% w/w), and rosemary essential oil (1, 3, and 5% by volume). We optimized the process using the response surface method and Design Expert software, and the results showed that increasing the concentration of biopolymers and essential oil led to lower values of thiobarbituric acid number and the total amount of volatile nitrogenous bases.Specifically, the sample coated with the maximum concentration of substances had values of 0.05 mg and 7.5 mg, respectively, compared to 0.305 mg and 10.85 mg for the coated sample with minimum concentrations. Therefore, the best coating was produced with 214.11% w/w whey protein concentrate, 25% w/w maltodextrin, and 402.3% w/w rosemary essential oil.Based on the microbial results, we found that the best coating solution to prevent microbial growth for cold-loving bacteria was the sample that contained medium and medium amounts of whey protein concentrate and the highest

percentage of rosemary essential oil. Regarding mesophilic bacteria, the best effect was related to the maximum amount of maltodextrin and whey protein concentrate along with the highest amount of rosemary essential oil. Overall, our research demonstrates the potential of natural coatings as an effective method for controlling spoilage in tilapia fish and highlights the importance of optimizing coating formulations and processes for maximum effectiveness in the food packaging industry.

Keywords: Whey,Maltodextrin,Rosemary gWhey,Maltodextrin,Rosemaryg,Whey,Maltodextrin,Rosemary,Tilapia,ResponseSurface Methodology,Coating

saharmirbagheri73@gmail.com

Smart food packaging

Zeinab Yari[1], Ghazal Mehrad[2]

1. Master's student in Health and Food Safety, Ahvaz University of Medical Sciences

2.Ph.Dstudent,foodscience and Tecnology, Sari Agricultural Science and Natural Resources Univercity, Sari,Iran

Background: Over the years, the food industry has been able to respond to the demand for suitable and varied food, and the food and beverage packaging industry has played a significant role in paving this way. In the 19th century, pioneers such as Nicholas Appert, Louis Pasteur, Prescot Samuel C and Willieam L Underwood developed ideas related to the food packaging industry and food preservation. Smart packaging is defined as a type of packaging that contains an internal or external identifier, which informs the consumer about the storage conditions of the packaging in the past or the quality of the food. Intelligent packaging, for which some sources use the term smart packaging, is a type of packaging that is made by understanding and sensing some of the characteristics of the food in which it is packaged. And the characteristics of the environment in which the food is kept are able to inform or warn the producer, seller or consumer about the status of these characteristics. This article reviews the types of smart packaging.

Keywords: Food, Smart packaging, Identifier

z.yari1373@gmail.com

Methods of identifying fraud in food

Ghazal Mehrad[1] , Zeinab Yari[2]

1.Ph.Dstudent,foodscience and Tecnology, Sari Agricultural Science and Natural Resources Univercity, Sari,Iran

2. Master's student in Health and Food Safety, Ahvaz University of Medical Sciences

Background: Food adulteration has been a concern since the dawn of civilization, as it not only reduces the quality of food products, but also has adverse health effects. Valid tests and detection of fraud in various food products are very important to ensure the health of the consumer against possible risks caused by frauds today. Through this review of different types of adulterations made in different food products, the health risks imposed by these adulterations and the available detection methods for them have been compiled. Following the concern about food safety

and regulation, various techniques such as physical, biochemical/immunological and molecular techniques have been developed to detect food adulteration. Molecular methods are preferred for the detection of biological adulterants in food, although physical and biochemical techniques are preferred for the detection of other food adulterants. Therefore, the purpose of writing this article is to investigate possible food frauds and identify them.

Keywords: Food, fraud, safety, identification

Gh.mehrad17@gmail.com

Simultaneous Saccharification and Fermentation

Amir pourmoradi

Ph.D. student of food science and technology, Tarbiat Modares University, Tehran, Iran

Background: Intemperate abuse of customarily utilized fossil fuel has been the major root cause of consumption of its saves. Furthermore, natural concern, vitality security, brief supply with an expanding request for fuel lead to appropriation of maintainable vitality assets such as sun oriented, wind, biofuel, etc. Among all, ethanol was demonstrated as a promising biofuel with different focal points. Sugarcane and corn which are considered as customary crude fabric for ethanol generation, barely meets the current worldwide request for biofuel. Hunt for most promising nourish stock for ethanol generation, spearheaded the utilize of lignocellulosic biomass and starch-based materials. But low ethanol surrender of lignocellulosic biomass without innovative breakthrough constrained analysts to elect the bland based courses. In later a long time, as it were organism based Simultaneous Saccharification and Fermentation (SSF) has been advanced effectively as a starch-based bio ethanol generation prepare whereas overcoming the issues related with utilizing destructive chemical and costly chemicals. The foremost advantage of microbial SSF handle is starch hydrolysis and sugar maturation can be prepared in a single vessel whereas minimizing the substrate restraint impacts and generally response time. This review discusses the numerous perspectives of Simultaneous Saccharification and Fermentation (SSF) handle within the setting of existing ethanol generation courses.

Keywords: Saccharification, Fermentation, ethanol

Amir.poormoradi20@ut.ac.ir

Awareness and Attitudes of Students at Ilam University of Medical Sciences Regarding Food Hygiene and Safety: A Descriptive-Analytical Study

Zeinab lotfinia[1]

1· Graduated in food industry engineer, Ahvaz, Iran

Background: Acknowledgment of the critical importance of food safety and hygiene in safeguarding human health and preventing diseases is widespread today. This research endeavors to investigate the awareness and attitudes of students enrolled at Ilam University of Medical Sciences concerning food hygiene and safety. Methods: This study adopted a descriptive-analytical approach with a cross-sectional design. A questionnaire was devised, and its validity and reliability were evaluated. The questionnaire encompassed inquiries regarding personal details, levels of

awareness, and attitudes toward food hygiene and safety. A cohort of 400 students from Ilam University of Medical Sciences was chosen through convenience sampling. Data analysis was carried out utilizing Stata version 14 software, employing descriptive statistics such as mean and frequency, alongside analytical tests including independent t-tests, Pearson correlation coefficient, and chi-square. Results: The findings unveiled that 54% of students demonstrated a commendable level of awareness, while 38% displayed a moderate level, and 8% exhibited poor awareness concerning food hygiene and safety. The scores reflecting awareness and attitude among students regarding the principles of food hygiene and safety were notably associated with age, education level, and gender (P-value0.05). Discussion: Grasping the fundamentals of food hygiene and safety is deemed imperative. Despite the relatively satisfactory level of awareness displayed by students in this study, there exists a necessity for more targeted strategies to further bolster their awareness**.**

Keywords: Awareness, Attitude, Hygiene

Lotfinia10@gmail.com

Investigating the effect of berberine supplementation on insulin resistance in women with polycystic ovary syndrome: a narrative review

Elnaz charoosaei[1], Mehdi Arjmand[2]

1. Student research committee, Jondishapur University of medical science, Ahvaz, Iran

Background: Polycystic ovary syndrome (PCOS) is the most common endocrine disease in reproductive age. Its estimated prevalence is between 4 and 21% among adolescent and reproductive age women. Recent studies have shown that at least 50% of women with PCOS have insulin resistance. This study investigates the effect of berberine supplement on insulin resistance in these women. Methods: To perform this review, EMBASE, PubMed and Google search engines were searched with the words Berberine, PCOS and insulin resistance. 8 eligible studies (2013-2023) were examined. All studies were in English. Results: Increased insulin resistance plays a key role in the pathogenesis of PCOS. Berberine increases insulin sensitivity by increase AMPK mRNA and IRS-1 mRNA levels, and reduce the level of mTOR mRNA in granulosa cells of PCOS patients. Also, by regulating the expression of GLUT4, it leads to the enhancement of glucose absorption. Another known mechanism is induction of glycolysis and inhibition of hepatic gluconeogenesis by berberine. In one study, berberine, like metformin, improved insulin sensitivity and reduced fasting blood sugar. In addition, berberine can protect pancreatic islets of Langerhans cells through its antioxidant activity. Discussion: Berberine can reduce insulin resistance by promoting glucose utilization in peripheral tissues. However, it has fewer side effects than the usual drugs used in the treatment of PCOS.

Keywords: Berberine ،PCOS ،insulin resistance

elnazcharoosaei@gmail.com

The comparison of the main dietary and non-dietary trigger factors in women with chronic and episodic migraine

Sepideh Hajarzadeh[1], Samaneh Hajarzadeh[2], Davood Shalil Ahmadi, Zeinab Nick Niyaz, Reza Mahdavi

1) Medical student of Ahvaz University of Medical Sciences

2) Ph.D student of nutrition, Ahvaz University of Medical Sciences

Background: Migraine is one of the most common neurological diseases and the second cause of disability worldwide. Various trigger factors have been reported in different populations. The current study was designed to extract the main trigger factors using factor analysis, and compare the chronic and episodic patient scores for every extracted pattern. Methods: In this cross-sectional study, 300 migrainous women (25–55 years old) participated. A constructed 46-item Likert questionnaire was developed to assess the primary triggers. The validity of the designed questionnaire was assessed by Content Validity Ratio and Content Validity Index coefficients. The test–retest method was employed to assess reliability. The exploratory factor analysis was performed to extract patterns of correlation among 46 triggers. Each participant was given a score for every extracted pattern. The mean scores of chronic and episodic patients were compared using the Mann–Whitney test. Results: The mean body mass index of participants was 28.17 ± 5.44 kg/m2. Most participants (90.7%) had migraine without aura. Four factors were extracted using factor analysis that explained 22.37% of the total variance: (1) environmental and behavioural factors; (2) condiments; (3) nitrite, tyramine and caffeine; and (4) fats. None of these factors explained the difference between chronic and episodic migrainous women. Discussion: The current study suggests that environmental and behavioural factors, relative to dietary triggers, play an essential role in causing migraine in women and more than dietary triggers. The most important triggers did not differ between episodic and chronic migrainous women.

Keywords: factor analysis, migraine, triggers, women

hajarzadeh97@gmail.com

Comparison of waxy corn Starch and dent corn Starch

Ladan Sinaki[1*] , Bahareh Borhani [1], Mehdi Jafari Asl[1] , Mehdi Amini[1] , Mohsen Amini[1]

1- Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Tehran, Iran

Background : Two common types of starch are waxy and dent corn starch with unique characteristics and applications. Waxy corn starch is derived from waxy corn, which is a type of corn with high amylopectin content and low amylose content. Waxy corn starch has a higher amylopectin content than dent corn starch. Amylopectin is a polymer with a branched chain of glucose units, while amylose is a linear polymer of glucose units. Dent corn starch is a popular choice for coating and frying foods in addition to its thickening and sticking properties. Corn starch forms a paste after mixing with water that can be used to coat food before frying. In addition, dent corn starch is a gluten-free alternative to wheat flour and is suitable for those with gluten sensitivity or celiac disease. It is also

an adhesive in meat products such as sausages and meatballs. Waxy corn starch is usually used for non-food applications such as paper and textile adhesives due to its superior adhesion and thickening properties. Waxy corn starch is ideal for producing strong flexible films and coatings in the paper and packaging industries. Waxy corn starch is preferred in industries that require gelling and stabilizing agents such as pharmaceuticals, cosmetics, and personal care products. The balanced ratio of amylose to amylopectin of dent corn starch allows it to form stable gels and provide a lasting texture in various formulations. In pharmaceutical applications, corn starch is used as a binder in tablet formulations and as a disintegrant in oral forms.

Keywords: Waxy corn starch, Dent corn starch, Amylopectin , Amylose, Application

* Corresponding Author: Ladan Sinaki

Research and Development, Farhikhtegan Zarnam, Zar Group Company, Tehran, Iran

l.sinaki@zarholding.com

Recent Developments of Using Ultrasound in Food Technology

Roghayeh amini sarteshniizi [1*], Bahareh Borhani[1], Mehdi Jafari Asl[1] , Mehdi Amini [1], Mohsen Amini [1]

1) Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Alborz, Iran

Background : Ultrasound comprises mechanical sound waves originating from the molecular movement that oscillates in a propagation medium. These waves have a very high frequency of about 20 kHz and are divided into two categories (low intensity and high intensity waves). Ultrasound (US) is used in the physical and chemical processing of food materials. US (mono-frequency and multi-frequency) alone and combined with other thermal and non-thermal technologies are used to improve food processing performance. Low-energy US is used for diagnostic purposes, while high-energy US is used as an alternative to traditional processing methods. One of the most common uses of the US in the food industry is cell destruction and extraction of intracellular substances. Depending on its intensity, ultrasound can be used to activate or deactivate enzymes, mixing and homogenization, emulsification, drying, fermentation, decontaminate, dissolve the ingredients and crystallization, hydrogenation, meat tenderization Solid-liquid extraction to accelerate and improve the extraction of active ingredients from the matrix and also degassing are other applications of US. The chemical effect of ultrasound on the structure of the proteins changes their functional properties. The disinfecting effects of ultrasound increase with increasing intensity and decrease with increasing frequency. The use of the US reduces processing time, reduces energy consumption, improves process efficiency and product quality, increases product safety, reduces damage to the food structure, and preserves nutritional values.

Keywords : Cavitation, Extraction, Frequency, Fermentation, High energy, Inactivation of enzymes

*Corresponding Author: Roghayeh Amini Sarteshnizi

Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Karaj, Iran

roghayehamini66@gmail.com

A Review on Production and Application of Different Caramels

Saghi Fakhrae[1*] , Ronak Gholami[1] , Mehdi Jafari Asl[1] , Mehdi Amini[1] , Mohsen Amini [1]

1- Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Tehran, Iran

Background : Caramel is used as a coloring and antioxidant agent in different foods and drinks. Caramel has functional properties such as emulsifying properties and flavor stabilization. It consists of several thousands of low and high molecular weight compounds that are formed during the caramelization reaction. There are four types of caramel, which are produced by heating carbohydrates in the presence of acid or alkali. Based on the use/no use of sulfite and ammonium compound, they are categorized into simple caramel, sulfite caramel, ammonium caramel, and ammonium-sulfite caramel. Color strength, pH and the boom degree are the main factors for selection and application of caramels. Stable caramels at low pH values are suitable for low pH products. The safety of caramels is investigated based on two compounds, 4-methylimidazole and 2-acetyl-4-(1,2,3,4-tetrahydroxybutyl)imidazole. Caramel is added to bakery products to increase the color and attractiveness. Powdered caramel is used to standardize the color of baking mixes such as bread, cake and cookie. The acceptable daily intake for type I caramel has not been determined by FAO/WHO. This index for type II caraml is 160 mg/kgbw while for type III and IV caramels is 200 mg/kgbw.

Keywords: Caramel, 4-methylimidazole, Color, Bakery products, Safety

*Corresponding Author: Saghi Fakhraei Tafreshi

Research and Development, Farhikhtegan Zarnam, Zar Group Company, karaj, Iran

s.fakhraee@zarholding.com

Application of Ultra High Pressure processing for modification of starch

Milad Pero[1*], Reza Ghasemi[1], Hamidreza Pourramezan[1], Mehdi Jafari Asl[1],Mohsen Amini[1] ,Mehdi Amini[1]

1. Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Tehran, Iran

Background : Ultra High Pressure (UHP) process is considered as a novel technology in food industry as an alternative for thermal process. This technology is utilized for increasing the shelf life of food products. However, despite this application, it can be used for inserting changes in the structure of starch and improving its properties. Native starch has some limitation that restricts its applications. Therefore, depending on its application, it is modified to give specific properties. In UHP, starch slurry is subjected to 400-600 MPa pressures in a specific period of time and during these treatment, structural properties of starch is changed. In this process, the enthalpy of starch gelatinization is decreased and granules inner structure becomes porous. Moreover,

the resulting starch paste becomes creamy and the peak viscosity is increased. Moreover, due to the porous structure, the granules of this starch is accessible to chemical reagents and the rate of chemical reactions such as acid hydrolysis which is a time consuming process, is increased.

Keywords : starch, modified starch, ultra high pressure, UHP

*Corresponding Author: Milad Pero

Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Karaj, Iran

m.pero@zarholding.com

Cold plasma as an Aflatoxins blocking and degrading treatment; Mechanisms and application

Hamidreza Pourramezan[1], Reza Ghasemi[1], Milad Pero[1], Mehdi Jafari Asl[1], Mehdi Amin[1]

1) Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Tehran, Iran

Background : Aflatoxins are amongst the most perilous mycotoxins that may contaminate foodstuff from the farm to table. Although controlling aflatoxin contents of food products relies heavily on prevention strategies, the need for the novel aflatoxin decontamination techniques that can safeguard human safety is necessary. Cold plasma (CP) is one of the novel non-thermal technologies, capable of deactivating microorganisms and mycotoxins with low environmental impact, high efficiency and low cost. This review provides a brief introduction to aflatoxins and CP, and explains the mechanism behind the blocking and degrading effects of CP on aflatoxins. More so, this review briefly compares CP treatment with the conventional aflatoxin removal methods. Finally, it discusses the challenges and shortcomings of industrialization of CP treatment. Although CP is a promising method to decontaminate aflatoxins compared to conventional methods, the exact active components and sites involved in aflatoxin blocking or degradation are still unclear, and the studies on food products are somewhat limited. Hence, more studies should be conducted to completely understand the diverse effects of CP on food products as an aflatoxin removal technique.

Keywords : Cold plasma, Aflatoxins, Non-thermal treatments, Food safety

*Corresponding Author Hamidreza Pourramezan, Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Karaj, Iran

h.pourramezan@zarholding.com

The anti-diabetic potential of protein hydrolysates and bioactive peptides derived from cereals and Pseudocereals

Amin Karimi[1*], Amir Pouya Ghandehari Yazdi[1], Nooshin Bazsefidpar[1], Mahdi Amini[2]

1 Department of Research and Development, Zarmacaron Compony, Zar Research Industrial Development Group, Alborz, Iran

2 Board Member, Zar Research Industrial Development Group

Background : Diabetes, characterized by uncontrolled, long-term high blood sugar levels, is a complex and heterogeneous disorder with serious global health implications. Cereals and pseudocereals, as

staple foods, serve as major sources of protein. These grains are potential sources of food-derived bioactive peptides that may play a role in preventing and ameliorating diabetes. Recent research has focused on isolating, purifying, and analyzing anti-diabetic protein hydrolysates and peptides from cereals and pseudocereals. This review delves into their anti-diabetic activities and mechanisms, examining in vitro inhibition of carbohydrate digestive enzymes and dipeptidyl peptidase-IV (DPP-IV). These findings highlight the promise of incorporating these bioactive peptides into functional foods aimed at controlling diabetes

Keywords : Cereals and semi-cereals, protein juices, bioactive peptides, antidiabetic potential

*Amin Karimi

Department of Food Research and Development, Zar Research and Industrial Development Group, Alborz, Iran

a-karimi@zarmacaron.com

A review on application and uses dextrose monohydrate in various industries espetially food industry

Bahareh Borhani[1*] , Mehdi Jafari Asl[1] , Mehdi Amini [1], Mohsen Amini [1]

1- Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Tehran, Iran

Background : Dextrose Monohydrate (D-glucose) is a sugar that's a stable, odorless, white crystalline powder or colorless crystal. In its pure form, it has a dextrose equivalency (DE) of 100, which indicates that it's 100% pure Dextrose, not a mixture with other substances as well. Dextrose Monohydrate is a common form of glucose widely used as nutrition supplement in food production. As a dietary monosaccharide, Dextrose Monohydrate can be used in a wide variety of industries including: food production, beverage, pharmaceutical, agriculture, cosmetic and various other industries. It is extensively used in food industry and can provide support in replacing sucrose in baking, dairy products, canned products, chewing gum and preserves. Other than this, it is also used in beverage powders, in caramel coloring and other compositions where it supports extended shelf life of the products. The presence of dextrose also supports keeping powdered beverage drinks free flowing. In this article, the application and Uses of dextrose in various industries is discussed.

Keywords : Dextrose monohydrate, application, food industry, technological properties

*Corresponding Author (Bahareh Borhani)

Knowledge-Based Research Center, Farhikhtegan Zarnam, Zar Group Company, Karaj, Iran;

b.borhsni@zarholding.com

Biopolymers with natural compounds and dyes derived from waste used in films with pH sensing properties to indicate food quality and safety

mahsa darkak[1] , golnaz bahriye [2], leila rafiei [2], sajed amjadi , alireza ebrahimi[3]

1 Department of Food Sciences, Tabriz branch, Islamic Azad University, Tabriz, Iran

2 Department of Food Science and Technology, Faculty of Agriculture, Urmia University, Urmia, Iran

3Student Research Committee, Department of Food Science and Technology, Faculty of Nutrition and

Food Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

Background : The growing environmental concerns of disposing of plastic packaging have led to the innovation of biodegradable polymers. Consumer demand and health concerns necessitate the emergence of active and intelligent packaging systems to monitor the quality of packaged food. The new smart packaging solutions are being developed to monitor the quality of packaged foods, with dual functions as food preservation and quality indicators. In the creation of intelligent and active food packaging, many colorants have been employed effectively as pH indicators and active substances,. While the use of chemical colors as an indicator in smart packaging is not suitable for food packaging due to its high toxicity and harmful effects on human health and the environment. Hence, researchers have focused on natural pigments derived from plants and food waste as indicator materials in biodegradable packaging as well as for valorization of food waste. Therefore, the use of food by-products and waste materials in the preparation of edible films due to extraction from natural products does not concern the health of the consumer and the food, and they are considered as sustainable materials for the environment.

Keywords : Agricultural wasteFruits and vegetables, Processing by-products, Biodegradable polymer, Packaging film

darkakmahsa@gmail.com

Visual monitoring of food freshness using plant essential oils and pH-sensitive natural pigments in dual-functional packaging

Mahsa darkak[1], ainaz Alizadeh[1], leila Roufegarinejad[1], sajed amjadi[2] , hamed hamishekar[3]

1 Department of Food Sciences, Tabriz branch, Islamic Azad University, Tabriz, Iran

2 Research Institute of Food Science and Technology (RIFST), Mashhad, Iran

3 Drug Applied Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Background : A large amount of food is wasted throughout the supply chain, thus developing suitable active packaging materials can alleviate food waste and extend the shelf life, thus developing suitable active and intelligent packaging materials can alleviate food waste and extend the shelf life. Intelligent and active packaging precisely meets these desired requirements. Intelligent packaging has the potential to offer real-time feedback on environmental changes within the packaging, providing valuable information about food quality and safety. On the other hand, active packaging represents a novel approach that incorporates active ingredients, such as antimicrobials into packages to enhance food quality. This review highlights recent advancements in dual-functional packaging utilizing various plant essential oils and pH-sensitive natural pigments. It explores different methods, with a focus on electrospinning and double layer, and also discusses existing challenges and future trends. In conclusion, this review establishes a theoretical foundation for addressing food quality and safety concerns. Furthermore, the ongoing and rapid development of film-forming

substrates, along with the exploitation of natural plant active ingredients, will create new opportunities for the practical application of multifunctional, green, and safe food packaging systems. Results: In conclusion, establishes a theoretical foundation for addressing food quality and safety concerns. Furthermore, the ongoing and rapid development of film-forming substrates, along with the exploitation of natural plant active ingredients, will create new opportunities for the practical application of multifunctional, green, and safe food packaging systems.

Keywords : Dual-functional, monitoring, Food freshness, Natural pigments, Plant essential oils, Visual monitoring

darkakmahsa@gmail.com

Investigating the effect of vitamin D supplementation during pregnancy and its effect on the incidence of asthma in infants: a systematic review

Seyedeh Taravat Mortazavi [1], Mehdi Arjmand, Rezvan Chaharlang, Elnaz Charoosaei, Arash Seraj zade

1. Student research committee, Jondishapur University of medical science, Ahvaz, Iran

Background: Maintaining normal levels of vitamin D during pregnancy has significant benefits in preventing and controlling diseases in babies and children. Among these benefits is reducing the risk of contracting and preventing the occurrence of diseases such as cancer, chronic syndromes, neurological and respiratory diseases. In this study, the effect of vitamin D supplementation during pregnancy in the prevention of chronic and inflammatory asthma in infants and children has been investigated. Methods: In order to study, different types of databases such as PubMed, Google Scholar, Web of Science with the keywords Asthma, vitamin D prevention, children, infants, pregnancy without time restrictions, and prioritizing articles for meta-analysis were checked. 25 studies were reviewed and finally 12 studies were included in this review. All studies reviewed were in English. Results: Most of the conducted studies point to the positive effect of vitamin D supplementation and prevention of asthma in infancy and childhood. Maintaining proper levels of vitamin D by affecting the correct expression of genes can cause this effect. Vitamin D is effective in prevention by affecting the immune system and regulating the production of inflammatory cytokines, and it plays its role by affecting proteinase enzymes and inducing anti-fibrotic effect. Vitamin D is also effective in lung cell differentiation, so proper lung cell differentiation is also effective in prevention. In another group of studies, no significant and specific relationship between supplement consumption and asthma prevention has been seen, which can be caused by epidemiological and physiological factors in the target population. Discussion: In general, it can be said that taking vitamin D supplements during this period plays a significant role in disease control and can be effective in inhibiting the growth of this chronic inflammatory disease, but in order to discover the effect of this vitamin on asthma, additional studies should be conducted.

Keywords : Asthma, vitamin D prevention, children, infants, pregnancy

arjmand.meh@gmail.com

The Impact of the Mediterranean Diet on Stress Symptoms in Adults: A Systematic Review

Pouya Bamneshin [1], Mohamad Javad Pouryousefi , DezfuliAida Zahednia , Zahra Asadi

1 Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Background: Stress is a common issue affecting adults worldwide, with detrimental effects on physical and mental health. The Mediterranean diet, characterized by high consumption of fruits, vegetables, whole grains, and olive oil, has been associated with various health benefits. However, its impact on stress symptoms in adults remains unclear. Methods: A systematic review was conducted to investigate the effect of the Mediterranean diet on stress symptoms in adults. Relevant studies were identified through electronic databases (e.g., PubMed, Scopus) using keywords such as "Mediterranean diet," "stress symptoms," and "adults." Inclusion criteria included randomized controlled trials and observational studies assessing the relationship between Mediterranean diet adherence and stress symptoms. Results: The initial search yielded a total of 15 studies meeting the inclusion criteria. Among these, 10 studies reported a significant association between adherence to the Mediterranean diet and reduced stress symptoms in adults. The remaining five studies showed mixed results or no significant effect. Overall, the majority of studies suggested a beneficial impact of the Mediterranean diet on stress symptoms. Discussion: The findings indicate that adherence to the Mediterranean diet may have a positive effect on reducing stress symptoms in adults. The mechanisms underlying this relationship could be attributed to the anti-inflammatory and antioxidant properties of the diet, which may help mitigate the physiological responses to stress. Future research should focus on elucidating the specific components of the Mediterranean diet that contribute to its stress-reducing effects.

Keywords : Mediterranean diet, stress symptoms, adults, health benefits, anti-inflammatory, antioxidant

pouyabamneshin82@gmail.com

Optimizing low-fat probiotic yogurt enriched with nanoemulsion of Mentha longifolia essential oil containing omega-fatty acids

nasrin faraji[1] , soheila faraji [2], minoush faraji [3], sasan ghanadan[4]

1 Research and Development, Azin company, shoushtar, Iran,

Background : In this study, omega-3 fatty acid nanoemulsions were prepared by spontaneous emulsification using mentha longifolia essential oil. The aim of this study was to investigate the optimum conditions for the production of probiotic yogurt enriched with nanoemulsions of essential oil with omega-3 fatty acids using a optimal design) and then the physicochemical properties of probiotic yogurt were evaluated. Nanoemulsions containing omega-3 fatty acids were first produced using plant essential oil (omega3, 40-day shelf life, 100% SOR, and Tween 80:20 surfactant type) and then enriched with probiotic yogurt with the produced nanoemulsions. The effect of two

independent variables was concentration of nanoemulsion at three levels (0, 2.5 and 5%) and storage time at three levels (1,11 and 21 days) on physicochemical characteristics, probiotic population growth and sensory properties of yoghurt. The addition of nanoemulsions in probiotic yogurt had significant effects on peroxide index, synersis, probiotic population viability and sensory evaluation, and population growth of probiotic were in the presence of nanoemulsions of ML Containing Omega Fatty Acids due to nutrient availability and synersis amount decreased by adding nanoemulsions.

Keywords : Nanoemulsion, Mentha Longifolia, Essential oil, probiotic,Yogurt

nasrin.faraji88@yahoo.com

A review of protein and carbohydrate based fat substitutes in food products

Maedeh Jabarzadeh Marand [1]

1) Faculty of Nutrition Sciences and Food Industries, Institute of Nutrition and Food Industries of Iran, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Background : In the last decade, the number of studies on fat substitutes and their implementation in food formulations has increased dramatically due to consumer demand for low-fat foods. Fat substitutes are components that may completely or partially replace fat in a food product, while maintaining the same physicochemical properties. Fat substitutes can include carbohydrates, proteins, or lipids. Fat substitutes play two main roles: reducing calories and fat intake in daily diets and the amount of fat consumed in the preparation of food products, as well as simulating and imitating different properties of fat in products. Fat substitutes show different properties by strengthening tissue as stabilizers, emulsifiers, gelling and thickening agents. Choosing the right type of fat replacer is very important because the performance of fat varies greatly depending on the type of meal and formulation. Evidence shows that reducing fat intake can help control body weight and the risk of developing diseases such as type 2 diabetes, high blood pressure, and cardiovascular disease. Fat substitutes are useful to help control caloric intake and promote the consumption of nutritious meals. This review discusses the classification of different types of fat substitutes, then protein or polysaccharide based fat substitutes and finally their limitations in the food industry. It aims to provide an in-depth insight into the fact that fat substitutes can be used in different food products, so that food formulas can be modified to reduce fat consumption in line with a healthy lifestyle.

Keywords : Fat substitute, fat mimic, protein, carbohydrate, polysaccharide

maedeh.jabarzadeh.m@gmail.com

Investigating the effect of Spirulina Platanis microalgae in some foods

Zahra Ramezanli[1] , Fatemeh Nasrollahi[1], Maryam Beigomi[2]

1)Bachelor student of food science and industry, Zahedan University of Medical Sciences

2)Assistant Professor, Department of Food Science and Industry, Zahedan University of Medical Sciences

Background : Today, with the increase in people's awareness and the change in their habits, the need for beneficial foods has been noticed by people, and the enrichment of these products with protein, minerals, vitamins, and fats causes the need for supplements and medicine in people. to decrease, among the known species of algae, blue-green microalgaeDue to its amazing health-enhancing and nutritional properties, it has been the focus of the attention of the manufacturers and researchers of the ultra-profitable food industry, and it is one of the most widely used food microalgae, which has been recognized as a superior food by the World Health Organization. So far, spirulina has been reported for enrichment in many products such as: beverages, meat and dairy products, cookies and biscotti bread, and it contains antioxidant properties that are used as a natural color instead of dangerous artificial colors, ready-to-eat snacks Attractive because of its texture, taste and shapeThe most interesting products are children, they often have low nutrients and colors of unnatural origin, which in the long run lead to malnutrition and health of this segment of the society

Keywords : Spirulina Platanis, microalgae, enrichment

tanin24680@gmail.com

Investigating the effect of some ingredients on gluten-free bread

Zahra Ramezanli[1] , Maryam Beigom[2]

1)Bachelor student of food science and industry, Zahedan University of Medical Sciences

2)Assistant Professor, Department of Food Science and Industry, Zahedan University of Medical Sciences

Abstract: Celiac disease is caused by the consumption of gliadin component of gluten found in wheat grain and prolamin of rye, barley and oat and is one of the most common food allergies. Since the only way to treat these patients is to use a gluten-free diet, the demand for gluten-free products has increased. Therefore, the major challenge of the food industry is to develop products with high nutritional value for health. In this context, bread is very important due to its high position in the diet. Currently, gluten-free breads are being produced. Considering that gluten is a necessary structural protein of baking products, especially bread, replacing other ingredients instead of gluten is the biggest technological problem. The results showed that gluten-free bread has an acceptable quality compared to wheat bread. But in terms of texture, it is similar to the texture of wheat bread and has a bitter aftertaste.

Keywords : Bread without gluten, gluten, celiac

tanin24680@gmail.com

---

consumer attitudes toward foods technology and its related factors in 2022

Mehrnoosh Shirdeli[1], Masoud Sami[2], Nasim Shahabi[3], Matthew Shirani[4]

1. Food security research center, department of food science and technology, school of nutrition and food science, Isfahan university of medical sciences, Isfahan, Iran

2. Associate professor, food security research center, department of food sciences and

technology, school of nutrition and food science, Isfahan university of medical sciences, Isfahan, Iran

3. Department of food hygiene and quality, college of veterinary medicine, Shahrekord, Chahar Mahal Bakhtiari,Iran

4. Independent clinical research LLC, springfield, Illinois, united states of America

Background and Aims: In recent years, new food technologies have created innovations in the food sector. The success of these new foods in any geographical area depends on the acceptance of that technology by people. Therefore, the present study was conducted with the aim of investigating the level of people's fear of food technology and its related factors in Isfahan city. -Materials and Methods: The statistical population of the research includes customers of stores in 4 regions of Isfahan city with a number of 390 people who were randomly selected as a cluster. The data collection tool is a researcher-made questionnaire with validity and reliability in two demographic sections and items related to the buyers of stores in 4 regions of Isfahan city based on the health belief model. -Results: The findings showed that there is no significant difference between gender and marriage in all the structures of the health belief model, but in people with a bachelor's degree, higher economic income, younger than 40 years old, and an urban area above the city, there is less fear of buying food produced with There was new technology. -Conclusion: The results of this research showed that FTNS is a valid tool to show consumers' acceptance of new food technologies in Isfahan city and this tool can be used for the acceptance of food technology in other cities of Iran.

Keywords : consumer attitudes, foods technology , related factors, Isfahan

*Corresponding author: Mehrnoosh shirdeli

Food Security Research Center, Department of Food Science and Technology, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran

mehrnoosh.shirdeli@yahoo.com

Investigating the level of awareness and perceptions regarding the consumption of transgenic rice using the health belief model, in 2022

Mehrnoosh Shirdeli[1], Masoud Sami[2], Nasim Shahabi[3], Matthew Shirani[4]

1. Food security research center, department of food science and technology, school of nutrition and food science, Isfahan university of medical sciences, Isfahan, Iran

2. Associate professor, food security research center, department of food sciences and technology, school of nutrition and food science, Isfahan university of medical sciences, Isfahan, Iran

3. Department of food hygiene and quality, college of veterinary medicine, Shahrekord, Chahar Mahal Bakhtiari,Iran

4. Independent clinical research LLC, springfield, Illinois, united states of America

Background and Aims: The emergence of transgenic products, like many other innovations, has met with widespread agreement and opposition, both in the scientific community and in the general public. In this regard, the present study was conducted to investigate the level of awareness and perceptions regarding the consumption of transgenic rice using the health belief model, in 2022. -Materials and Methods: The statistical population of the

study included consumption of transgenic rice who buy genetically modified food from stores in Isfahan city in a sample of 390 people as cluster-random. Data collection tools, a researcher-made questionnaire with valid validity and reliability in two demographic sections and items related to the consumption of transgenic rice based on the health belief model. -Results: The findings showed that the structure of perceived interests had the highest score and the structure of consciousness had the lowest score among the studied structures. It also showed that there was no significant difference between the sexes in all structures of the health belief model, and in terms of media use, the most common guidelines for the operation of the subjects were the use of the Internet and the lowest source of radio. -Conclusion: According to the results obtained, which indicates a lack of information and awareness of the consumption of transgenic products, it is recommended to provide training in this field. Also, transgenic labeling on products should be visible so that people can choose their products with full awareness.

Keywords : Genetic modification, health belief model, awareness, Attitude

*Corresponding author: Mehrnoosh shirdeli

Food Security Research Center, Department of Food Science and Technology, School of Nutrition and Food Science, Isfahan University of Medical Sciences, Isfahan, Iran

mehrnoosh.shirdeli@yahoo.com

Bioactive peptides derived from sea-foods, and algal processing by-products as functional food ingredients

Mobin Zare zanjirbalaghi[1] , Akram Pezeshki[1] , Maryam Mohammadi[2*]

1. Department of Food Science, College of Agriculture, University of Tabriz, Tabriz, Iran

2 .Department of Food Science and Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran

Background: Foods that contain components known for their health-promoting qualities, beyond just their nutritional value, are called functional foods. These particular components are referred to as functional food ingredients. Mainly, the bioactive peptides purified from food materials, including animal, plant, sea foods, and algal sources, have been identified as such functional food ingredients. In this review, we discuss the purification process of bioactive peptides from sea-foods, and algal sources, and their processing by-products. Additionally, we highlight the technologies currently used to purify bioactive peptides from sea-foods, and algal, including modern computational techniques like insilico methodology or bioinformatics as well as and methods to enhance the purification process. These techniques can be applied in the future to purify bioactive peptides in order to boost the efficacy of bioactive peptide purification. Furthermore, we summarize the bio-functional activities of bioactive peptides from sea-foods, and algal, which help to protect the body against various diseases, thereby proving their potential to be functional food ingredients.

Keywords : Bioactive peptides ،by-products ،sea-foods ،algal sources ، Functional food Hydrolysate

mobinzare9999@gmail.com

Corresponding:
maryam.mohammadi1193@gmail.com

Nanoencapsulation of bioactive components as a burgeoning nanotechnology-based approach for development of functional foods

Mobin Zare zanjirbalaghi[1] , Akram Pezeshki[1] , Maryam Mohammadi[2*]

1. Department of Food Science, College of Agriculture, University of Tabriz, Tabriz, Iran

2 .Department of Food Science and Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran

Background: Society has witnessed an increased consciousness regarding the consumption of nutritious food products and associated commodities that encompass bioactive components (BACs). These BACs have the potential to positively impact human well-being. Regrettably, the enduring stability and bioactivity of BACs in the face of environmental factors undermine their intended and efficacious functionality. Nanoencapsulation is a highly efficient technique utilized to encapsulate environmentally responsive BACs within nano capsules, thereby enhancing their stability and bioavailability. Hence, this review investigates the impact of encapsulation on BACs and explores how nanoencapsulation techniques can be utilized in the food sector to preserve and enhance the functional attributes of naturally present food BACs. Nanoencapsulation can also facilitate the generation of favorable sensory characteristics (such as aroma, texture, color, and taste), thereby playing a significant role in the formulation and advancement of innovative food and beverage products. Nanoencapsulation is currently witnessing sustained growth owing to its distinct capabilities, broad adaptability, and a wide array of practical uses. The success of nanoencapsulation can be attributed to its well-documented efficacy in preserving the encapsulated BACs from the surrounding environment. Additionally, it aids in optimizing the delivery and controlled release of the transported active compounds. Hence, in this comprehensive analysis, we have presented the most recent breakthroughs in the development of nanocarriers for the encapsulation of BACs. Additionally, we have discussed the significant applications of these nanocarriers in the realms of functional food and intelligent food packaging.

Keywords : Novel food ،bioactive compounds ،Product formulations ، Functional characteristics ،Human health

mobinzare9999@gmail.com

Corresponding:
maryam.mohammadi1193@gmail.com

Halal in The Food industry: Shariah Requirements and Practical Challenges

Somayeh Salehfekr , Hamideh Behruzmoqadam

1) Somayeh Salehfekr Assistant professor of Chemical Engineering, Shahriar Branch, Islamic Azad University, Shahriar, Iran

Abstract: In Islam, there are rules and rules for eating and using food, which are known as "halal and haram rules". These rulings provide a framework for Muslims to choose halal and clean food. With the ever-

increasing expansion of the food industry and the variety of products, the adaptation of these products to Sharia rules has become increasingly important. Food industries play a vital role in providing food to society. Therefore, it is an undeniable necessity to pay attention to the halal and haram of raw materials, production process and final products in this industry. Failure to pay attention to this issue can have religious and health consequences for Muslims. This article seeks to review the Shariah rulings related to Halal and Haram in the food industry, focusing on: detailed review of the Shariah rulings related to Halal and Haram in food, introduction and review of halal management systems, providing examples of practical challenges in the field of food halal It is the description of practical solutions to solve the existing challenges.

Keywords : Halal, Food industry, Islamic Requirements, Health, Ethics, Practical Challenges

somayeh_sf79@yahoo.com

The Use of Neohesperidin Dihydrochalcone (NHDC) In The Formulation of Carbonated Diet Soda

Somayeh Salehfekr Arabani [1]

1) Somayeh Salehfekr Assistant professor of Chemical Engineering, Shahriar Branch, Islamic Azad University, Shahriar, Iran

Abstract : Diet sodas are one of the most popular beverages in the world. These drinks are without sugar or calories and artificial or natural sweeteners are used instead of sugar. Common artificial sugar substitutes such as saccharin, acesulfame potassium, aspartame, … have various problems, such as the aftertaste problem and the limitation of dosage and daily use. For this reason, special attention has been directed to natural sugar substitutes and improving the properties of dietary products. In Iran, carbonated diet soft drinks have been produced using acesulfame potassium and aspartame, and due to the resulting problems such as shelf life and unpleasant taste, it has not been well received. The use of neohesperidin DC, which is a natural sweetener, was investigated along with the artificial sweeteners aspartame and acesulfame potassium, and according to the sensory evaluation of the participants, the following results were obtained. The combined formula of sweeteners Dosage (ppm) in diet soda with cola flavor: Aspartame: 160, Acesulfame-K: 160, Neohesperidin DC: 2.5 And the results of this study showed that neohesperidin DC can be a suitable option in carbonated diet soft drinks containing artificial sweeteners and improves the sensory properties of the soft drink such as reducing bitterness and increasing the sweetness of the soft drink, and the evaluation of the sensory quality of carbonated diet soft drinks containing neohesperidin DC showed which is acceptable in terms of taste and is not significantly different from carbonated soft drinks containing sugar.

Keywords : carbonated diet soda, formulation, sweetener, Neohesperidin DC

Somayeh_sf79@yahoo.com

Evaluation of blankit residues in suagarloaf factories in Zanjan province in 2022-2023

Narges Khalafi[1] , roya Jafari[2] , Farhad Gharebaghi[3]

1. PhD Student, Department of Food Science and Technology, Science and Research Branch, Islamic Azad University, Tehran, Iran

2. Master Student, Department of Food Science and Engineering,Faculty of Agriculture, University of Zanjan, Zanjjan, Iran.

3. PhD of chemistry, Department of Food and Drug Control, Zanjan University of Medical Science, Zanjan, Iran

Background: this paper present a study on the presence of sodium hydrosulfite (Na2O4S2) /blankit residues in sugarloaf crops in Zanjan province, Iran, in 2022-2023.To improve the appearance of sugar products, such as whole sugar, bleaching materials called blankits are used in the production process. Adding chemicals to food, if there is no adequate supervision and management, can be a serious threat to human health and the environment. Methods: samples were collected from various sugarloaf factories in the Zanjan region in 2022-2023.The concentration of blankit in sugar loafs was determined according to the method of Iran's National Standard institute (No.: 14519) based on the colorimetric method of rosalinine . Data were analyzed using SPSS 16 and EXCELL 2013 software. Results: The results showed that the residual amount of blankit in 23.3% of samples was higher than the standard limit of Iran's National Standard Institute (10 ppm). Discussion: The results of this study indicated that blankit, as an additive, has been used higher than standard limitation in 23.3% sugarloaf factories ; hence, it can be considered as a threat to human health.

Keywords : sugarloaf, Blankit, sodium hydrosulfite

nargeskh69@yahoo.com

Concentration of Heavy Metals in Bread and Health Risk Assessment

seyedeh Belin Tavakoli Sani[1] , Mohammad Hashemi[2] , Sajad ghasemi

1. Department of Health, Safety, Environment management, School of Health Mashhad University of Medical Sciences, Mashhad, Iran

2. Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Continuous quality monitoring of bread sources is essential to provide healthy bread and maintain public health of citizens. The purpose of this study is to evaluate the concentration, and health risks of selected heavy metals in Bread in Mashhad, Iran. Methods: In this study, the urban area was divided into 5 areas by simple random sampling method, and during the summer season of 2019, 90 flour samples, 90 dough samples, and 90 bread samples were collected from these areas. After preparing the samples and using the acid digestion method, and all heavy metals was measured by the inductively coupled plasma emission spectrometer. Results: The obtained results showed that the level of aluminum, arsenic, chromium and iron were the most contaminants, which exceeded the maximum permissible criteria of the World Health Organization and the Food and Agriculture Organization of the United Nations. Relying on target hazard quotient and carcinogenic risk results,

bread consumers in studies were exposed to moderate to high levels of carcinogenic (CR≤1x10-4) and non-carcinogenic risk (HI>1). Discussion: our finding showed the potential health and cancer risks through eating bread in Mashhad, and this means that the presence of heavy metals in bread consumed in Mashhad can have consequences for the health of consumers. Therefore, it is recommended to continuously monitor wheat and food products derived from it in terms of heavy metal content to maintain food safety because the results of these monitoring can be used as a basis for decision-making in improving human health.

Keywords : Heavy metals, Bread, Health risk, Carcinogenic risk

belintavakoli332@gmail.com

Evaluation of the development of the export of dairy products in the Russian market

Naeimeh Shabani[1] , Mortaza Ayani[2] , Mohadese Mohamadi[3]

1)Department of Quality,Research & Development , Iran Dairy Industries Commercial Co.,Tehran ,Iran

2)Department of CEO , Iran Dairy Industries Commercial Co. ,Tehran ,Iran

3)Department of Quality,Research & Development , Iran Dairy Industries Commercial Co. ,Tehran ,Iran

Introduction: In recent years, entering foreign markets has played a very important role in economic development, and the most important effort of manufacturing companies and marketers is to take measures to create, increase and maintain market share, but due to the complex economic and political conditions, choosing strategies to enter foreign markets is difficult and complicated. Russians spend almost twice more on food than Europeans. Milk and dairy products are on the top of the chart of food consumption in Russia. Methodology: The purpose of this research is to investigate the types of dairy products and strategies of the Russian market and to investigate the consumption trend of this group of products and to analyze the Russian market in the field of dairy products. examining the culture and taste of dairy consumption and per capita and knowing the target market and customer needs, as well as creating product diversity and innovation in this field It can keep loyal customers in a competitive market. Findings: Considering the high costs of transporting frozen products, in addition to maintain and develop the sales portfolio of frozen products, including frozen condensed milk, primary cheese curds, it is necessary to focus on non-frozen products, including powdered products, as well as UHT cream. Discussion: The Russian market can play a vital role in filling the vacant capacities, profitability and attraction of dairy products; furthermore, the proximity of the distance to Iran can be considered as a potential and actual market

Keywords : Dairy, Russia, Milk, Market, Frozen products

n.t.sh.iran@gmail.com

Investigation of nitrate content in agricultural products cultivated in farms of Zanjan province

Roya Jafari[1] , narges khalafi[2] , farhad gharebaghi[3]

1 Department of Food Science and Engineering, Faculty of Agriculture, University of Zanjan, Zanjan, Iran

2. PhD Student, Department of Food Science and Technology, Science and Research Branch, Islamic Azad University, Tehran, Iran

3. PhD of chemistry, Department of Food and Drug Control, Zanjan University of Medical Science, Zanjan, Iran

Background : Fresh and processed vegetables, especially leafy greens, are major sources of dietary nitrate intake. The main goal of this research was to determine the concentration of nitrates in widely used agricultural products. The research was conducted in the farms of farmers in Zanjan province. The selected products were apples, potatoes, cabbage and lettuce. The tests were performed using the recipe provided by the National Standards Organization of Iran. The amount of residual nitrate in the products was measured by liquid chromatography (HPLC) at a wavelength of 205 nm. The test was repeated three times on each sample and finally 60 samples were tested. The results of the experiments were analyzed by one-way analysis of variance by SPSS software. The results showed that the average nitrates in apple, potato, cabbage and lettuce were 30.2, 88.6, 356.3, and 585.6 mg/kg, respectively. Therefore, the highest concentration of nitrate among the tested samples was related to lettuce and the lowest was related to apple. The current research showed that the average concentration of nitrates in agricultural products produced in Zanjan is lower than the maximum levels allowed in the national standard of Iran and other international standards. Considering the fresh consumption of many vegetables, improper use of chemical fertilizers can cause many health problems (nitrate accumulation) for consumers in addition to environmental issues and pollution in water and soil sources, therefore, a balanced diet is very important.

Keywords : nitrate, potatoes, lettuce, cabbage, agricultural products

r.jafari9675@gmail.com

The study of Production of fortified macadamia milk powder

Seyed Ali Mohammadi[1] ,Hosseini Taher Seyed Jamal[2] , Zohreh Saraei[3]

1 khorasan razavi agricultural and natural resources research and education center and Research and development unit of Shorin Tejarat Hosseini Company

2 CEO of Shorin Tejarat Hosseini Company

3 Quality control manager of Shorin Tejarat Hosseini Company

Background : Macadamia belongs to the Proteaceae family and is a type of hazelnut that originates from Australia. Due to its unique nutritional properties, this nut can be used in the form of nuts or formulations in other foods. Macadamia nuts are rich in unsaturated fatty acids, fiber, protein, vitamins and minerals without cholesterol. Studies show that due to the limited physical and chemical breakdown of macadamia nuts (raw or roasted) in the mouth, stomach and small intestine, digestion may not be done completely, therefore, a product with Produced highly digestible macadamia milk. This product is a colloidal non-dairy health drink containing proteins, lipids, polysaccharides, tannins, phytates, fibers and antioxidant compounds. Nowadays, the consumption of nut milks and its by-

products is increasing rapidly in the world due to its unique characteristics. In addition, the high amount of B vitamins in macadamia milk and the presence of compounds such as calcium, phosphorus, potassium, selenium, sodium, unsaturated fatty acids and iron can make it a suitable combination to be used as a snack or combined with Introduce other foods. Also, the enrichment of macadamia milk powder in the form of encapsulation with other beneficial compounds can increase its nutritional properties. Therefore, in this article, an attempt is made to investigate the production method of macadamia enriched milk powder and its nutritional properties.

Keywords : Macadamia, milk powder, enrichment, encapsulation

alimohamadi247@gmail.com

Green extraction, health-promoting activities and techno-functional properties of natural seaweed pigments and their role in intelligent food packaging and food systems

Farnaz Goli [1], Maryam mohammadi[2*]

2 Department of Food Science and Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran

1 Department of Food Science, College of Agriculture, University of Tabriz, Tabriz, Iran

Background : Edible seaweed is a worthwhile source of natural pigments (NPs) such as carotenoids, chlorophylls, and phycobiliproteins, and these functional ingredients have been well-acknowledged due to their beneficial therapeutic properties. These NPs show valuable biological properties such as neuroprotective, anti-cancer, antioxidant, anti-inflammatory, anti-bacterial, anti-angiogenic, and anti-obesity activities. The therapeutic potential of NPs highlights their potential applications in food industries. NPs are frequently used as food colorants, providing nutritional value and enhancing the sensorial and techno-functional properties of the final product. Also, the use of these NPs is presently being expanded to intelligent food packaging to observe food freshness and as a time-temperature indicator to improve the food properties and shelf life. Properly using seaweed in foods could incline a novel segment of seaweed-based hybrid/composite health foods. This review critically analyzes the recent advances from 2015 to 2023 in seaweed NPs' green extraction, their therapeutic properties, potential techno-functional properties ensuing in food items, and their role in intelligent food packaging systems.

Keywords : Natural pigments, Therapeutic potential, Techno-functional properties, Food packaging

farnazgoli96@yahoo.com

Corresponding:Maryam,mohammadi1193@gmail.com

An overview of the presence of microplastics in bottled water and their identification methods

Pariya Moshtaghi Zadeh

Department of Food Science and Technology, Shiraz University, Iran

Background : Plastic is widely used in food packaging due to its low cost, lightweightness, and ability to preserve freshness. However, concerns have been

raised about the impact of microplastic particles on human health. One of the remarkable features of plastic in food packaging is the belief that it is neutral and does not affect the quality of food, which is why it is increasingly used in water and food packaging. Still, this belief has been challenged in the last few years because of the discovery of microplastics. Microplastics are plastic particles with the size of 1 micrometer to 5 mm, which are created from the physical breakdown of larger plastic particles. One source of microplastic particles is food packaging, especially plastic bottles. These particles are environmental pollutants that can cause toxicity, oxidative stress, and inflammation in the human body. Mineral or drinking bottled water is one of the most significant sources of microplastic particles. Various methods, including optical and fluorescent microscopes, can identify and count microplastic particles in bottled water samples. This article reviews past research on microplastic particles in bottled water and discusses laboratory methods for identifying them.

Keywords : microplastic, bottled water, Nile Red staining

paria.moshtaghizadeh@gmail.com

Edible Films Made from Various Nuts

Maryam Shariati[1] , Mitra Rezaei gorgani[2]

1.Master's student in food hygiene and safety, Nutrition Department, Faculty of Medicine, Mashhad University of Medical sciences, Mashhad, Iran

2.Assistant Professor, Nutrition Department, Faculty of Medicine, Mashhad University of Medical sciences, Mashhad, Iran

Abstract: This article provides a structured review of edible films made from different nuts. Edible films have gained significant attention in recent years due to their potential as sustainable and biodegradable alternatives to conventional packaging materials. Nuts, including almonds, walnuts, cashews, and pistachios, are among the natural sources that have been explored for producing edible films. The aim of this review is to highlight the structural characteristics and properties of edible films derived from various nuts, as well as their potential applications in food and packaging industries. The review begins by summarizing the current challenges associated with conventional packaging materials, including environmental concerns and the need for sustainable alternatives. It then discusses the potential of utilizing nuts as a renewable source for producing edible films, outlining their availability, composition, and general structural properties. The structural characteristics of nut-based edible films are thoroughly examined, including their mechanical, barrier, thermal, and microbial properties. The article evaluates the effect of different processing techniques, such as solvent casting, extrusion, and compression molding, on the microstructure and properties of nut-based edible films. Relevant factors influencing film properties, such as the proportion of nuts, plasticizers, and other additives, are also discussed. Moreover, this review provides an insight into the potential applications of nut-based edible films. Examples include their use as active packaging materials, for encapsulating bioactive compounds, enhancing shelf-life and quality of food products, and reducing environmental waste. Additionally, the advantages and

limitations of using nuts for film production are discussed, including factors such as availability, cost, and consumer acceptability. Future perspectives and potential areas of research to further improve the properties and performance of nut-based edible films are also highlighted. In conclusion, nut-based edible films offer promising opportunities as sustainable and biodegradable alternatives to conventional packaging materials. Their structural characteristics and properties make them suitable for various applications in the food and packaging industries. Continued research and development in this field will provide further insights and advancements towards the utilization of nuts for edible film production.

Keywords : edible films, nuts, sustainability, structural properties, mechanical properties, barrier properties, thermal properties, microbial properties

mshariati75@gmail.com

Acrylamide in flatbreads: legislation, occurrence, formulation, baking methods and strategy to reduce

vahid ghasemzadeh Mohammadi[1] , Negin Johari[2]

1)Assistant Professor of Nutrition Department, Faculty of Medicine, Hamadan University of Medical Sciences

2)senior student of health and food safety, Hamedan University of Medical Sciences, Hamedan Medical Sciences

Background : Acrylamide is a chemical compound that is produced in foods that go through the heat process at a temperature above 120 ° C and during the Maillard reaction. Asparagine is the main precursor for the formation of acrylamide. Acrylamide has many adverse effects, including infertility, teratogenicity, carcinogenicity, and neurotoxicity, and is classified by the International Agency for Research on Cancer in Group 2A (probably carcinogenic to humans). Flatbreads are among the foods that have been in people's food baskets for many years and are the most consumed daily. Bread production processes (moisture, asparagine content, fermentation conditions, pH, additives, baking conditions and type of flour) are among the factors that affect the amount of acrylamide in it. Various organizations, including the FDA and EFSA monitor acrylamide levels in foods. Although flatbreads have a low content of acrylamide, considering its high daily consumption, it becomes more important to deal with it. This study examines the factors affecting the concentration of acrylamide, and its reduction methods in flatbreads, and the laws regarding the content of acrylamide.

Keywords : acrylamide, flatbread, millard, asparagine

nginjohari@gmail.com

Kefir: types, production methods, and health benefits

Ali Nazari[1*] , Soleiman Abbasi[2]

1- M.Sc. student, Department of Food Science & Technology, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran

2- Professor, Department of Food Science & Technology, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran

Background: Kefir, a traditional fermented dairy product from the Caucasus region, is celebrated for its unique probiotic qualities and its various health benefits. For its production, milk is fermented with kefir grains, a symbiotic mix of bacteria and yeast. Presently, kefir is accessible in both dairy and non-dairy forms. Kefiran, a polysaccharide secreted by kefir grains, enhances its therapeutic benefits. Methods: This study is based on a comprehensive literature review of the chemical, microbial, and therapeutic properties of kefir grains, kefiran, and kefir as a functional drink. Results: Over the past decades, different studies have validated kefir's therapeutic potential, highlighting its antimicrobial, anti-cancer, anti-diabetic, anti-allergic, and antioxidative properties. Additionally, it has been effective in managing conditions such as fatty liver, digestive disturbances, severe gut infections, and dysbiosis in children, and in reducing cholesterol and blood pressure, aiding weight loss, improving skin health, and supporting prenatal care. As a result, kefir can be considered a functional probiotic drink as it contains a wide range of useful microorganisms and bioactive compounds. Discussion: The advantageous health effects of kefir are attributed to the probiotic microorganisms in kefir grains, their interactions, and the metabolic by-products (bioactive compounds) produced during fermentation. However, challenges like off-flavor and phase separation during storage could impact its marketability.

Keywords : Kefir, Kefiran, Kefir grain, Probiotics

alinazari9345@gmail.com

Investigating the effect of covering Valencia oranges with chitosan containing piperita Mentha L extract on its quality during 3 months of storage

seyedeh maryam seifi[1] , reza morekian[2]

1) Master student of food industry, Department of Food Industry Engineering, Yazd University of Science and Art, Yazd, Iran.

Department of Food Industry, Faculty of Agriculture, Yazd University of Science and Art, Yazd, Iran

Background : The purpose of this study is to investigate the physical, chemical and appearance characteristics of Valencia oranges coated with chitosan containing peppermint extract. Oranges in 9 treatments containing different concentrations of 0.5, 1, and 2% chitosan along with 0.6, 0.9, and 1.2 ml/l of peppermint extract were immersed and kept after drying at refrigerator temperature (2 ± 1 °C). In the control treatment, fruits were stored in polypropylene bags. The amount of pH, shrinkage and appearance changes and microbial contamination were evaluated during 3 months of storage. The results showed that there was no significant difference in pH in different treatments, but with the passage of time, pH increased and the most changes were measured in the control treatment. The most wrinkling and appearance changes were in control treatment and dependent on chitosan concentration ($P<0.05$). Coating with chitosan and peppermint significantly reduced mold and fungus compared to the control treatment ($P<0.05$); Therefore, the use of chitosan and peppermint edible coating can increase the shelf life of the product and minimize the physiological activity and spoilage. According to the results of covering Valencia oranges with

2% chitosan containing 1.2 ml/l peppermint extract is suggested.

Keywords : Valencia orange, chitosan, peppermint, preservation

sanam.seifi1@gmail.com

Active packaging based on nano emulsions and nanostructured lipid carriers to increase the shelf life of food

Farnaz Goli[1] , Maryam Mohammadi[2*]

2 Department of Food Science and Engineering, Faculty of Agriculture, University of Kurdistan, Sanandaj, Iran

1 Department of Food Science, College of Agriculture, University of Tabriz, Tabriz, Iran

Background : Recently, there has been an increasing trend in the food and pharmaceutical industries towards using nanotechnological approaches to drug delivery and active packaging (edible coatings and films). In the food sector, lipid-based nanocarriers especially nano emulsion (NEs), and lipid based nanocarriers (NLCs) are the most promising technology for delivering active components and improving the barrier, mechanical, and biological properties of packaging to ensure the safety and quality of food products, as well as extend their shelf life. For this review, we used several databases to collect information about NEs, NLCs and their role in edible packaging. We searched for articles published between 2015 and 2024 and described different scientific approaches to developing active packaging systems based on NEs and NLCs, as well as their high-energy and low-energy synthesis methods. We also reviewed the uses of different types of essential oil-based NEs and NLCs in the packaging of food products to prolong their shelf life and ensure safety. The application of these nanocarriers in packaging systems is promising in terms of improving the packaging's physical, mechanical, barrier, and other functional properties, as well as extending the shelf life of fruits, vegetables, and other food categories.

Keywords : Nanoemulsions, nanostructured lipid carriers, active packaging, essential oils, synthesis methods, shelf life, edible films

farnazgoli96@yahoo.com

Corresponding:Maryam,mohammadi1193@gmail.com

A comprehensive review of advantages and limitations of PCL as biodegradable food packaging

Nishteman Zamani[1] , Vahid Ghasemzadeh mohmmadi[2]

1)Department of nutrition and food safety, school of medicine, Hamadan university of medical sciences, Hamadan, Iran

2)Assistant Professor of Nutrition Department, Faculty of Medicine, Hamadan University of Medical Sciences

Background : Polymers have provided the most common packaging materials for a long time because they offer several desirable properties, such as softness, lightness, and transparency. However, the increasing use of synthetic packaging films has led to serious environmental problems due to their lack of complete degradation. Although it is impossible to completely replace them with environmentally friendly packaging films, at least for certain applications such as food packaging, biodegradable plastics should be more

prosperous. Among biodegradable polymers, aliphatic polyester polycaprolactone (PCL) is one of the most attractive biodegradable materials due to its wide availability, good biodegradability, and biocompatibility. This polymer has attracted much attention in food packaging due to its hydrophobic properties, relatively good barrier properties due to its semi-crystalline nature, biodegradability, and approval by the Food and Drug Administration (FDA). However, PCL has limitations for application in this field due to its poor mechanical properties, low thermal stability, lack of bioactive properties, and antimicrobial activity. Adding other polymers and compounds can improve PCL-based film attributes, such as mechanical properties and permeability to water vapor and oxygen, and create antimicrobial and antioxidant qualities. This study provided an overview of the advantages and limitations of PCL as a biodegradable polymer in food packaging.

Keywords : Polycaprolactone, Bioactive compounds, Food packaging

nishtemanzamani@yahoo.com

Analysis of Edible Films formulated for Red Meat Preservation

Mitra rezaei gorgani[2] , Maryam Shariati[1]

1.Master's student in food hygiene and safety, Nutrition Department, Faculty of Medicine, Mashhad University of Medical sciences, Mashhad, Iran

2.Assistant Professor, Nutrition Department, Faculty of Medicine, Mashhad University of Medical sciences, Mashhad, Iran

Background : The objective of this research is to provide a comprehensive review of different edible films used for the preservation of red meat, examining their composition, properties, and effectiveness in maintaining meat quality. Methods: A systematic literature review was conducted, including articles from various databases such as PubMed, Scopus, and Web of Science. The search criteria included keywords such as "edible films," "red meat," "preservation," "meat quality," and "shelf life." Only articles published in the last decade were considered, resulting in a total of 50 articles. Results: Edible films have gained significant attention as an alternative to traditional packaging materials for red meat preservation due to their ability to extend shelf life, improve product quality, and reduce environmental impact. Several types of edible films were identified for red meat preservation, including biopolymers (e.g., gelatin, collagen, alginate, chitosan), plant-based films (e.g., starch, cellulose derivatives), and lipid-based films (e.g., beeswax, shellac). Each type of film has its unique characteristics in terms of mechanical properties, water vapor permeability, and antimicrobial activity. Biopolymers, such as gelatin and collagen, exhibit excellent film-forming properties and are often used in combination with other ingredients to enhance film stability and performance. Plant-based films, particularly those derived from starch, show good water barrier properties and can effectively reduce oxidation in red meat. Lipid-based films, such as beeswax, have been found to provide a protective barrier against moisture loss and microbial contamination in red meat. The antimicrobial activity of edible films is often enhanced by incorporating natural antimicrobials, such as essential oils, into the film matrix. These antimicrobial films can inhibit the growth

of spoilage bacteria and extend the shelf life of red meat. Conclusion: This study highlights the different types of edible films used for red meat preservation. Biopolymers, plant-based films, and lipid-based films all offer unique advantages in terms of preserving the quality and extending the shelf life of red meat products. Further research should focus on optimizing film composition, evaluating their compatibility with different red meat types, and assessing their impact on sensory attributes to ensure consumer acceptance and safety. Edible films present a promising avenue for sustainable meat packaging and preservation.

Keywords : red meat,edible films,shelf life,preservation,meat quality

mshariati75@gmail.com

Food flavorings

Amir Pourmoradian[1] , Hossein Mirsaeedghazi[2]

1) Ph.D. student of food science and technology, Tarbiat Modares University, Tehran, Iran

2)Associate professor, member of the faculty of food technology department, faculty of agricultural technology, faculty of agriculture and natural resources, university of Tehran

Background : Flavorings are a group of natural or chemical substances that are used to flavor foods or improve and increase their taste. Some of them are natural flavorings that are extracted from plants or animals, and others are artificial or synthetic, that are man-made. In order to use synthetic flavors, there is a specific dose to add them. Flavoring materials are added to the list of permitted flavorings by qualified experts after safety evaluation based on the intended use conditions. Basic principles for the safety evaluation of flavoring materials are reviewed with an emphasis on the safety evaluation of flavoring materials by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). In this research, a number of natural flavors such as vanilla, stevia, and coconut sugar, and a number of artificial flavors such as monosodium glutamate, benzaldehyde, and cinnamaldehyde, as well as a number of common sweeteners in the food industry, such as erythritol, saccharin, and aspartame, were investigated. In addition, the chemical structure of these flavorings and the permissible dose of their daily consumption were evaluated.

Keywords : Food flavorings, Natural flavorings, Artificial flavorings

amir.poormoradi20@ut.ac.ir

Ecological risk assessment of heavy metals in urban dust in Iran (a systematic review and meta-analysis)

Mohadese Neisi[1] , majid Farhadi[2] , Abulkazem neisi[3]

1)Student Research Committee,Department of Environmental Health Engineering,School of Public Health,Ahvaz Jundishapur University of Medical Science, Ahvaz

2)Environmental Health Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran

3)Department of Environmental Health Engineering, School of Public Health and Environmental Technologies Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz

Background : Heavy metals in street dust are one of the most important sources of pollutants in urban areas. This urban dust can be caused by industrial activities, traffic, erosion of buildings, and fossil fuels. The aim of this systematic review is to evaluate the ecological risk of heavy metals in the dust of Iran's provinces. This study was conducted on February 2023 in order to investigate the environmental risks associated with heavy metals associated with dust particles in Iran. Search databases such as Scopus, Web of Science, Iran Doc, Mag Iran, Science Direct, and PubMed were used to find original articles in this field. Mesh words are also used in PubMed to select English keywords.The present study was conducted based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Finally, 9 studies were extracted from the search databases. The ecological risk of heavy metals in the present study was as follows: Cd (258.26؛ CI: 83.53, 433) >Pb (52.58؛ CI: 37.15, 68.02) >Cu (24.44؛ CI: 16.74, 32.14)>Ni (14.75؛ CI: 12.68, 16.82)>As (13.53؛ CI: 10.20, 16.85)>Zn (6.32؛ CI: 3.76, 8.87)>V (3.18؛ CI: 2.65, 3.72)>Cr (2.73؛ CI: 2.19, 3.27)>Co (1.94؛ CI: 1.13, 2.74). The obtained results show that the ecological risk of Pb in the cities of Shiraz, Tehran, Ahvaz, Ilam, Abadan, Kermanshah and Dezful has exceeded the standard. The mean ranking of the studied Pb ecological risk is as follows: Shiraz > Tehran > Ahvaz > Ilam > Abadan > Dezful. The ecological risk potential of Cd in Tehran was also much higher than the standard. Therefore, Tehran was the most polluted city studied in terms of the ecological risk potential of Cd (1611.41؛ CI: 1605.98, 1616.84) and Pb (86.54؛ CI: 71.46, 101.62). The average concentration as well as the ecological risk of Cr, Co, and V metals were lower than the standard.Therefore, controlling the sources of heavy metal emissions (especially lead and cadmium) is highly recommended

Keywords : Ecological risk, Heavy metals, IRAN, Risk assessment

neisimohadese@gmail.com

The health risk of exposure to heavy metals caused by the consumption of food products (rice, vegetables and bread)

Majid Farhadi[1] , mohadese neisi[2] , Abulkazem neisi[3]

1)Environmental Health Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran

2)Student Research Committee,Department of Environmental Health Engineering,School of Public Health,Ahvaz Jundishapur University of Medical Science, Ahvaz

3)Department of Environmental Health Engineering, School of Public Health and Environmental Technologies Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz

Introduction: Humans are always exposed to pollution, these pollutions mainly include heavy metals and organic substances. These metals can enter vegetables, rice and bread in different ways. Considering the per capita bread, vegetables and rice in the Iranian food basket, especially in Hoveyzeh and Azadegan plain, we decided to calculate the risk of exposure to heavy metals caused by the consumption of these products. Material and Method: The study area in the current research is Hoveyzeh and Azadegan plains, which are two southern cities in Khuzestan

province. The food products studied to measure heavy metals are all kinds of vegetables, rice and bread. In order to calculate the health risk assessment, the formulas of Hazard Quotient and cancer risk were used. Result: The present study measured the concentration of five heavy metals (arsenic, cadmium, chromium, lead, and nickel) in food such as rice, vegetables, and bread. The five common types of rice consumed in Hoveyzeh and Azadegan plains are Anbar, Domsiah, Tarom, Indian, and Pakistani. Comparison of the non-carcinogenic risk of heavy metals in two groups of children and adults showed that HI and HQ were smaller than 1 for both groups. The highest HQ and HI for children were related to arsenic, which were 0.0127 and 0.0137 for Tarom rice, respectively. But the highest HQ and HI for adults were related to arsenic, which were 0.0059 and 0.0064 for Tarom rice, respectively. Comparing the carcinogenic risk of heavy metals in two groups of children and adults showed that CRs and ILCR for both groups were smaller than 1*10-6. Therefore, foods such as vegetables, rice and bread consumed in the study area do not have cancer risk in terms of toxic heavy metals. Conclusion: The results of these investigations show that the soil or water used for planting vegetables, rice or wheat contained large amounts of heavy metals and did not meet the standards required for irrigation and planting of these crops.

Keywords : risk assessment, heavy metal, cancer risk, food products

neisimohadese@gmail.com

Utilization of food industry waste for enhanced food safety: whey protein coating with broccoli extract to control pathogen development in chicken fillets

Azadeh Nourmohammadi[1] , Majid Aminzare[1] , Hasan Hasanzad azar[3] , Sara Nabati[1] , Saeede Soltan Ahmadi[1] , Narges Khalafi[2]

1)Department of food safety and hygiene, school of public health, Zanjan, Iran

2)Department of food science and technology, science and research branch, Islamic Azad University, Tehran, Iran

3)Department of food science and engineering, faculty of agriculture, University of Zanjan, Zanjan, Iran

Background : The purpose of this study was to investigate the possibility of using food industry waste such as vegetable residue and dairy byproducts to expand the recycling industry. Furthermore, the research aimed to improve food safety by examining the usage of whey protein coating enhanced with broccoli extract to control the contamination of chicken fillets with Salmonella enteritidis and Listeria monocytogenes. The study assessed the development of inoculated S. enteritidis and L. monocytogenes using varying concentrations of broccoli extract in coated chicken fillets after 0, 3, 6, 9, and 12 days of refrigerated storage.

Keywords : Whey protein, Broccoli extract, chicken fillets, Salmonella enteritidis, Listeria monocytogenes, Food safety

nourmohammadiazade@gmail.com

Recent trends in active packaging using nanotechnology to improve shelf life in aquatic food products

Sara Nabati[1] , Majid Aminzare[1] , Hasan Hasanzad Azar[3] , Azadeh Nourmohammadi[1] , Saede Soltan Ahmadi[1] , Narges Khalafi[2]

1)Department of food safety and hygiene, school of public health, Zanjan, Iran

2)Department of food science and technology, science and research branch, Islamic Azad University, Tehran, Iran

3)Department of food science and engineering, faculty of agriculture, University of Zanjan, Zanjan, Iran

Background : Aquatic food products (AFPs) are primarily preferred by consumers due to their high nutritional value. However, AFPs are easily degraded by microbial, enzymatic, and chemical reactions. Nanotechnology-based active packaging is a potentially effective solution to problems related to AFPs' perishability. Because nanotechnology manipulates materials at the nanoscale, it presents special prospects for applications in active packaging. It can create sophisticated systems with improved features that help reduce spoiling and extend the shelf life of AFPs. The perishability of AFPs can be addressed with a potential solution: active packaging that uses nanotechnology. Nano-preservation methods in AFPs can improve microbial and physicochemical parameters, extend shelf life, reduce microbial load, improve barrier qualities, managing the release of bioactive compounds, suggesting their potential to extend AFPs' shelf life. The sustainability of the environment as well as the consequences for safety and regulations must be taken into account. To maximize these technologies' performance, safety, and affordability, more study and development are required. To guarantee that food safety, environmental responsibility, and consumer acceptability are all met by nanotechnology-based active packaging, cooperation between researchers, industry players, and regulatory agencies is crucial. In addition, further exploration is necessary to comprehend the behavior of these active components under diverse environmental conditions, including temperature, acidity, pH, humidity, and duration of storage. Overall, active packaging with nanotechnology has great potential to improve the longevity, quality, and sustainability of AFPs. The sustainable progression of active packaging technologies based on nanotechnology may present new prospects for preserving AFPs in a more environmentally friendly manner.

Keywords : Active packaging, Aquatic food products, Nanotechnology

sarasnb75@gmail.com

The associations of dietary inflammatory potential and gastrointestinal cancers: a systematic review and meta-analysis of case-control studies

Farnush Bakhshimoghadam[1] , Maryam Shirani[1]

1)Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Background: Gastrointestinal (GI) cancers represent a significant cancer burden; collectively ranking fourth for cancer incidence and second for cancer mortality worldwide. Chronic inflammation plays a critical role in GI carcinogenesis. Current evidence suggests that diet plays a role in the regulation of inflammatory processes through the modulation of levels of inflammatory cytokines. Therefore, to reflect the overall inflammatory potential of

an individual's diet, the Dietary Inflammatory Index (DII) was developed as a dietary assessment tool derived from the literature. Methods: Relevant English language articles between January 2014 to September 2023 were identified by searching electronic databases including PubMed, Scopus, and Web of Science. We included studies that reported the odds ratio (OR) for the most pro-inflammatory diet compared with the most anti-inflammatory diet and for GI cancers. Effect sizes were pooled using a random effects model. Results: A total of 32 case-control studies were included in this meta-analysis. The results showed that the most pro-inflammatory versus the most anti-inflammatory diets were significantly associated with an increased risk of GI cancer (OR: 1.32; 95%CI: 1.23–1.27; I2=64.2%, P

Keywords : Inflammation, Dietary inflammatory index, Gastrointestinal cancer, Obesity, Meta-analysis

farnushbakhshimoghadam@gmail.com

New technologies for the production of meat and fat substitutes

Seyedeh Bahareh Mirporiyan [1]

1) PhD student, Department of Food Science and Engineering, Food Chemistry Department, Science and Research Unit, Islamic Azad University, Tehran, Iran.

Background : Today, with the increase in the world's population, the demand for meat has also increased because meat is the main source of protein and iron for the human body and plays an important role in human nutrition. According to the forecasts, the need for meat will be twice the current amount in the next 20 years, so meat production should also increase by this amount. The increase in meat production means the indiscriminate killing of animals, the increase in greenhouse gases, the indiscriminate consumption of water, the increase in common diseases of humans and animals, etc. Therefore, in recent years, finding new methods such as meat production in the laboratory without the need to raise and kill animals has become very important. The purpose of this study is to review the possibility of meat production with new methods such as 3D printing, nanotechnology and other physical methods of meat processing and fat substitutes.

Keywords : Meat, 3D printing, nanotechnology, nanoparticles, fat substitutes

baharemirpourian@hotmail.com

Investigating the properties and antimicrobial activities of biodegradable packaging with clove, basil and thyme essential oils for food packaging application

AmirHossein Nasiri [1]

1) Master's student in food hygiene and safety, Faculty of Health, Birjand University of Medical Sciences, Birjand, Iran

Background : Active packaging is a new method that is used to increase the shelf life of perishable foods, maintain or improve the quality and safety of prepared foods. The purpose of this study is to investigate the essential oil of clove, thyme and basil as an antimicrobial agent and to investigate their effect on food packaging. Clove oil composite films showed less green and

yellow color compared to thyme oil composite films. Clove oil composite film has shown an 80% increase in UV blocking efficiency. The tensile strength (TS) of the composite film of thyme oil and clove oil decreased from 1.35 MPa (control film) to 0.96 MPa and 0.79 MPa, respectively. Complete killing of Staphylococcus aureus, which is a reduction from 6.5 log CFU/mL to 0 log CFU/mL, was observed on the composite film of 10 wt% clove oil. The composite film of clove and thyme oil inhibited 93.43 and 82.30% of Escherichia coli biofilm, respectively. Also, chitosan film obtained from basil base, which has been tested as a packaging system for cooked ham samples for 10 days and with the aim of possibly using them to increase the useful life of the product, can inhibit the growth of bacteria in ham. cooked and significantly prevent the pH of the packaged food from increasing. Also, the chitosan film obtained from basil essential oil can be used as an active preservative package to increase the safety and shelf life of different types of food.

Keywords : Basil essential oil, thyme essential oil, clove essential oil, food packaging

amirhosseinnasiri0939@gmail.com

Biotechnological strategies for development of gluten-free products

Parnian Pezeshki [1] , Yegane Ghelichi [2] , Mahnaz Niazi [2] , Atefeh Sarafan Sadeghi [1]*

1 Department of food science and technology, Varastegan Institute for Medical Sciences, Mashhad, Iran

2 Department of Nutrition Sciences, Varastegan Institute for Medical Sciences, Mashhad, Iran

Background: Biotechnology has emerged as a powerful tool in the field of food science, revolutionizing various aspects of food production and addressing dietary needs of specific populations. One significant area where biotechnology has made notable contributions is the development of gluten-free food products. Gluten, a protein found in wheat, barley, and rye, poses challenges for individuals with celiac disease or gluten sensitivity. This abstract highlights the inter section of biotechnology and gluten-free food, focusing on the advancements and implications of biotechnological approaches in creating safe and palatable alternatives.

Methods: The present review was completed by searching “Pubmed” and “Google scholar” by different combinations of terms from the list of MeSH biotechnology, food industry and gluten-free. We searched from 2018 until the November 2023.

Results: Genetic engineering has facilitated the development of gluten-free crop varieties with reduced or eliminated levels of gluten proteins. Through the identification and manipulation of genes involved in gluten synthesis, these genetically modified crops offer a promising solution for individuals with gluten-related disorders. Additionally, enzymatic processing techniques have been utilized to breakdown gluten molecules, rendering them harmless or digestible to sensitive individuals. Furthermore, fermentation techniques involving beneficial microorganisms have been employed to improve the sensory and nutritional characteristics of gluten-free

products. Fermentation not only enhances the taste and texture of gluten-free alternatives but also increases their nutritional value by enhancing the bioavailability of essential nutrients.

Conclusion:The integration of biotechnology in the development of gluten-free food products have paved the way for future innovations, fostering a more inclusive and sustainable food industry.

Keywords: "biotechnology", "food industry", "gluten-free"

Sarafana@varastegan.ac.ir

---

probable defects affecting carbonated beverages acceptability, a review

Amir Shafaei Falah

Nutrition department, faculty of medicine, Mashhad university of medical sciences, mashhad, iran

Background: Carbonated beverages are beverages that have been carbonated through the addition of carbon dioxide (CO2). This process gives the beverage a light and effervescent quality that is widely consumed worldwide due to its refreshing taste. It is important that the shelf life of carbonated beverages can be affected by various factors such as temperature, light, and humidity. The shelf life of carbonated beverages can also be affected by the presence of artificial sweeteners or sugar. In these products, quality factors such as appearance or changes to the flavor profile may limit shelf-life. Carbonated beverages that do not contain fruit juice, a combination of preservatives, and carbon dioxide can limit microbiological growth. Methods: This review collects articles focused more on defects of carbonated beverages and factors that can decrease durability time and lead to bad taste and off-flavor in PubMed and Google Scholar. Results: Carbonation can make beverages more acceptable as time passes. It affects color and appearance, flavor, body and texture, and overall acceptance. Each factor that hurts the carbonation process or CO2 retention can affect appearance and flavor. Also, storage temperature and conditions can make off-flavor and decrease shelf life. Discussion: while carbonated beverages are popular, it is essential to consider the potential defects that can occur due to factors such as improper storage, contamination, incorrect carbonation, and co2 retention of bottles. By being aware of these potential issues, consumers can make informed choices and ensure they are consuming products that meet their expectations for taste and quality.

Keywords : carbonated beverages, food packaging, food storage, taste

amirshafaei75@gmail.com

The profound impacts of climate change on food security and nutrition

Mohammadreza Rostami[1] , Nabi Shariatifar[2] , Ebrahim Molaee-Aghaee[2] , Gholamreza Jahed-Khaniki[2] , Razieh Noroozi[3*]

1. PhD Graduated from the Division of Food Safety and Hygiene, Department of Environmental Health Engineering, School of

Public Health, Tehran University of Medical Sciences, Tehran, Iran;

2. Division of Food Safety and Hygiene, Department of Environmental Health

Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

3. *Doctoral student of Division of Food Safety and Hygiene, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Background : Food security is one of the most important goals of governments in terms of nutrition in societies, which according to definitions is the access of all members of the society to sufficient and safe food for a healthy life, which is the basis of the development of societies and improves physical and mental health. becomes a member of society. Developing countries have always faced crises such as drought, climate change, economic problems and various sanctions that affect their agricultural production and food products and endanger the food security of the society. This paper discusses the severe risks to food security and nutrition associated with ongoing and projected climate change, particularly extreme weather conditions in global warming, drought, floods and rainfall. We specifically consider impacts on populations vulnerable to food insecurity and malnutrition due to lower income, less access to nutritious food, or social discrimination. This paper defines climate-related "extreme risk" in the context of food security and nutrition, using a combination of criteria, including the magnitude and likelihood of adverse outcomes, the timing of risk, and the ability to mitigate risk. The extreme risks of climate change to food security and nutrition are those that are most likely to lead to widespread and persistent food insecurity and malnutrition for millions of people, and have the potential for cascading effects beyond food systems that we have limited ability to deal with or fully respond to. We have them. According to the international definitions and agreements of climate change and food security risks, this research examines different scenarios related to the escalation of food security risk due to climate change based on studies. Finally, this research suggests adaptation options, including management and institutional governance measures, that can be taken now to prevent or reduce extreme climate risks to food security and human nutrition in the future.

Keywords : Food security, climate change, food insecurity, sustainable health, sustainable economy

rostami_m73@yahoo.com

A review of mycotoxins, their identification and reduction methods

Shadieh Mohammadi[1] , Noushin Baghi[2] , Ashkan Gholami

1)Assistant Professor of Food Hygiene,Environmental Health Research Center,Research Institute for Health Development, Kurdistan University of Medical Sciences,Sanandaj, Iran.

2)Master's degree, Department of Food Science and Industry, Faculty of Agricultural Science and Food Industry, Science and Research Unit, Islamic Azad University, Tehran, Iran

Background : In recent years, mycotoxins produced by fungi have become a global threat in the food safety chain due to their negative economic and health effects in the livestock and food industry. Contamination of animal feed with mycotoxins is a common occurrence in farms; Because most fungi are able to produce several mycotoxins and can contaminate a feed at

the same time. The adverse effects of mycotoxins on the production and quality of the product can also be transferred to humans and cause serious risks including carcinogenesis. The control of mycotoxins is complicated and difficult, but today, new methods such as biosensors and the use of toxin binders in animal feed can identify fungal toxins and reduce their risks and negative effects. Considering the importance of animal husbandry and food industry in ensuring food security, raising awareness and applying appropriate environmental conditions plays a significant role in reducing adverse effects. Considering the importance of the mentioned topic, in the present study, the effects of mycotoxins on animal and human health, its economic effects in the animal feed and food industry, and methods for identifying and controlling mycotoxins in the livestock and poultry industry and the food industry have been reviewed.

Keywords : Mycotoxin, mycotoxicosis, toxin binder, biosensor, food safety

noushinbaghi.1998@gmail.com

The presence of microplastics in mineral water is a potential human health risk: A systematic review on examining the amount of microplastics in mineral water

Minoo Moghimani[1] , Mohammad Hashemi[2]

2. Assistant Professor, Department of Nutrition, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Background: Microplastics, tiny plastic particles, recently are receiving increasing attention because studies show that they can cause metabolic disturbances, neurotoxicity, and increased cancer risk in humans. Contamination of drinkable water with microplastics can be a direct contamination source for humans. Therefore, a systematic review examining the amount of microplastics in drinking water and mineral water is necessary. Methods: To identify related studies, scientific digital databases such as PubMed, Science Direct, and Google Scholar were searched from January 2000 to December 2023. Results: The results of the studies showed that water from reusable plastic bottles had the highest average number of polymer particles, with particles mainly composed of polyester (PET) and polypropylene (PP). Microplastic particles other than PET, such as polyethylene and polyolefins, have also been found in water in other types of packaging, such as beverage cartons and glass bottles. Discussion: The presence of PET and PP in the water of plastic bottles makes sense since the bottle is made of PET and the cap is made of PP. Moreover, The presence of polyethylene and polyolefins can be explained by the fact that the beverage cartons are coated with polyethylene film, and the lids are treated with lubricant. In addition, research into effective methods such as the environmentally friendly design of plastic products, production of alternative materials, development, and research in the field of plastics biodegradable plastics, and improved sewage treatment facilities to reduce microplastic pollution

Keywords : Microplastic, Polyester, Polypropylene, polyethylene, polyolefins, Mineral water

monoomooom77@gmail.com

Impact of Dietary Dioxins Exposure on Human Health: A Systematic Review

Atefeh SarafanSadeghi, Seyedeh Zahra Mozafari, Mohammad Mahdi Fahmideh, Parnian Pezeshki *

Department of food science and technology, Varastegan Institute for Medical Sciences, Mashhad, Iran

Background: Dioxins are a group of polychlorinated aromatic compounds that accumulate in the food chain, mainly in the fatty tissue of animals. More than 90% of human exposure is through food, mainly meat and dairy products, fish and shellfish. The International Agency for Research on Cancer (IARC) has classified the most toxic dioxins, 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD) as human carcinogen. The aim of this study is to review health risk assessment of dioxin exposure through Foods.

Methods: This review article was performed through PubMed, Science Direct, Google Scholar, SID, and Cochrane until November 2023. The keywords were dioxin, Humans risk assessment, dietary exposure, TCDD, and toxicity. Among the 76 articles found in this regard, 14 related articles were used at the end.

Results: Long-term exposure to dioxins is linked to impairment of the immune system, reproductive function, endocrine system and the developing nervous system. Associations with diabetes, thyroid dysfunction and heart diseases in humans have been reported in some studies. dioxins exert their effects through interaction with a specific intracellular protein in transduction pathway, the aryl hydrocarbon receptor (AhR) which create a specific complex of atypical enzymes. Also, dioxin disrupts the endocrine signaling routes and can increase mitochondrial ROS production which could play an important role in chronic inflammation.

Conclusion: In humans, exposure to dioxins with long biological half-lives (7–11 years) meansthat these chemicals accumulate in human bodies. Therefore, protecting the food supply is critical. Good controls and practices during primary production, processing, distribution and sale are all essential in the production of safe food.

Keywords: Dioxin, Dietary Exposure, Humans risk assessment, Toxicity

*Corresponding Author: Parnian Pezeshki

pezeshkip@varastegan.ac.ir

Microplastics: their distribution in seafood and seafood safety

Esmaeil Abdollah Zadeh[1]

1)Assistant Prof., International Sturgeon Research Institute, Iranian Fisheries Science Research Institute, Agricultural Research, Education and Extension Organization, Rasht, Iran

Background : Today, microplastics are known as an environmental problem. These tiny particles can enter the digestive tract of aquatic animals and cause problems for consumers. It is important from two different ways of microplastic pollution in seas and oceans. The first path of pollution is related to the presence of microplastics in

aquatic life, which can directly affect aquatic life. In this regard, taking into account that the methods of detecting microplastics in food tissue are less developed and most of the research is focused on their presence in the gastrointestinal tract of aquatic animals, more research needs to be done. But since research shows that microplastics can act as carriers of chemical compounds (such as pesticides and heavy metals) or even microbes, it is important to pay attention to this issue in terms of food safety. The current research, which is organized as a review, briefly mentions the pollution of microplastics in the aquatic life of different countries. Also, by examining the available scientific sources, it seems that the harmful effects of microplastics pollution in aquatic ecosystems and final consumers are very unknown, and the conclusion requires more research in the future.

Keywords : Food safety, microplastics, fishery products

abdollahzadeh@rocketmail.com

Exploring nutraceuticals for hypertension management: A Systematic Review

Atefeh SarafanSadeghi, Reyhaneh Shakiba, Mobina Yaghoobi, Parnian Pezeshki *

Department of food science and technology, Varastegan Institute for Medical Sciences, Mashhad, Iran

Background: Hypertension, or high blood pressure, is a prevalent cardiovascular condition that poses significant health risks worldwide. Traditional pharmacological interventions have been the mainstay for managing hypertension; however, emerging evidence highlights the potential role of nutraceuticals as alternative approaches in the treatment of this condition. Nutraceuticals refer to bioactive compounds derived from food sources, such as fruits, vegetables, herbs, and spices, that exhibit beneficial effects on human health. This abstract aims to explore the utilization of nutraceuticals in hypertension management.

Methods: This review article was performed through PubMed, Science Direct, Google Scholar, SID, and Cochrane until November 2023. The keywords were nutraceuticals, Hypertension, high blood pressure and bioactive compounds. Among the 82 articles found in this regard, 18 relatedarticles were used at the end.

Results: Numerous studies have investigated the potential of different nutraceuticals in reducing blood pressure. Several classes of nutraceuticals, including polyphenols (such as resveratrol, quercetin, and catechins), omega-3 fatty acids, coenzyme Q10, garlic extract, and beetroot juice, have demonstrated favorable effects on blood pressure regulation. These compounds possess antioxidant, anti-inflammatory, and vasodilatory properties that contribute to their observed cardiovascular benefits. Clinical trials and experimental studies have shown that nutraceuticals can effectively lower blood pressure by various mechanisms, including the inhibition of angiotensin-converting enzyme, modulation of endothelial function, reduction of oxidative stress, improvement of nitric oxide bioavailability, and suppression of inflammatory pathways. Moreover, some nutraceuticals have demonstrated additional benefits in improving lipid profiles, reducing insulin

resistance, promoting weight loss, and enhancing overall cardiovascular health, which are important considerations in hypertension management.

Conclusion: nutraceuticals offer a potential avenue for managing hypertension as adjunctive or alternative therapies to conventional pharmacological approaches. Their natural origin, favorable safety profiles, and diverse mechanisms of action make them attractive candidates for hypertension management.

Keywords: Bioactive compounds, Blood Pressure, Hypertension, Nutraceuticals

*Corresponding Author: Parnian Pezeshki

pezeshkip@varastegan.ac.ir

Modeling sunset yellow removal from fruit juice samples by a novel chitosan-nickel ferrite nano sorbent

samira Shokri[1] , Nabi Shariatifar , Ebrahim Molaee Aghaee , Gholamreza Jahed Khaniki , Parisa Sadighara

1)Department of Environmental Health Engineering, Food Safety Division, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Background : Analysis of food additives is highly significant in the food industry and directly related to human health. This investigation into the removal efficiency of sunset yellow as an azo dye in fruit juices using Chitosan-nickel ferrite nanoparticles (Cs@NiFe2O4 NPs). The nanoparticles were synthesized by the chemical co-precipitation method and characterized using various techniques. The effective parameters for removing sunset yellow were optimized using the response surface methodology (RSM) based on the central composite design (CCD). Under the optimum conditions, the highest removal efficiency (94.90%) was obtained for the initial dye concentration of 26.48 mg L-1 at a pH of 3.87, a reaction time of 67.62 minutes, and a nanoparticle dose of 0.0386 g L-1. The pseudo-second-order kinetic model had a better fit for experimental data (R2=0.98) than the other kinetic models. The equilibrium adsorption process followed the Freundlich isotherm model with a maximum adsorption capacity of 212.766 mg g-1. The dye removal efficiency achieved for industrial and traditional fruit juice samples (91.75% and 93.24%), respectively, confirmed the method's performance, feasibility, and efficiency. The dye adsorption efficiency showed no significant decrease after five recycling, indicating that the sorbent has suitable stability in practical applications. variousThe synthesized nanoparticles can be suggested as an efficient sorbent to remove the sunset yellow dye from food products.

Keywords : Chitosan, Fruit juice, Nanoparticle, Nickel ferrite, Sunset yellow

shokrisamira22@yahoo.com

Enhancing food safety through improved food traceability and transparency

Parnian Pezeshki [1] , Parisa Behnam [2] , Mobina Yaghoobi [2] , Atefeh Sarafan Sadeghi [1]*

1,2 Department of food science and technology, Varastegan Institute for Medical Sciences, Mashhad, Iran

Background: Food traceability and transparency are essential components of ensuring food safety and consumer trust in

the food supply chain. Traceability refers to the ability to identify and follow a food product, or its ingredients, through all stages of production, processing, and distribution. It allows for quick and efficient recall of products in case of contamination or other safety incidents. Transparency, on the other hand, involves the open sharing of information related to food production, such as origin, production methods and quality assurance measures. This allows consumers to make informed choices about the food they consume, fostering trust and confidence in the food industry.

Methods: The present review was completed by searching "Pubmed" and "Google scholar" by different combinations of terms from the list of MeSH food safety ,traceability and transparency. We searched from 2018 until the November 2023.

Results: Several technologies have emerged to enhance traceability and transparency in the food supply chain. These include blockchain, RFID (Radio-Frequency Identification), and QR code systems. Blockchain technology, in particular, has gained attention due to its decentralized and secure nature, which can ensure an immutable record of food product movements and transactions. Despite these challenges, governments, regulatory bodies, and food companies are increasingly recognizing the importance of food traceability and transparency.

Conclusion: Technology, legislation, and industry collaboration are essential in overcoming thechallenges associated with implementing these systems. As consumer demands for transparency continue to grow, it is imperative for all stakeholders to prioritize in these measures to create amore reliable food supply chain.

Keywords: "food safety", "traceability", "transparency"

*Corresponding Author: Atefeh Sarafan Sadeghi

Sarafana@varastegan.ac.ir

Systematic review of factors affecting malnutrition and growth disorders in infants aged 2 to 36 months

Maryam Hajmohamadi [1], Mohamad Bakhtyari [2] , Leyla Razi [3]

[1]. Senior nursing expert, lecturer at Sirjan University of Medical Sciences

[2] Anesthesiologist and faculty member of Sirjan University of Medical Sciences. Iran

[3] Neonatal specialist, member of the academic staff of Sirjan University of Medical Sciences. Iran.

Objectives:: Malnutrition and growth disorders in children and infants are among the most common nutritional problems that can cause delays in mental-physical growth, short stature, infection, impaired mental development, prevalence of mental-neurological disorders, lack of progress. education and even disruption in the life of parents. Therefore, it is very necessary to identify the factors affecting malnutrition and growth disorders in infants in the prevention of chronic and dangerous diseases. The purpose of this research is to systematically review) Factors affecting malnutrition and growth disorder in infants aged 2 to 36 months.

Methods: The current research was a review study that was conducted in a systematic way. The statistical population includes all the articles published in Persian and English-language scientific-research journals in the scientific databases: SID, Google scholar, Elmnet, Noormag, Iranmedex, Magiran, Pubmed and Scopus in the period (January 2003 to December 2023). was taken; Articles that had certain and appropriate reliability validity, statistical population and optimal sampling method and had related hypotheses and questions were selected. Key words used to select articles include: "malnutrition", "developmental disorder", "feeding behavior", "infants", "physical growth", "low weight", "birth to 3 years old", "factors". cultural", "economic factors". Finally, out of a total of 185 reviewed articles, 58 domestic and foreign articles were found to have completely relevant data and conform to the research entry criteria.

Results: The Findings showed that among the socio-economic factors: "monthly income of the family", "employment status of parents", "employment of both parents", "level of access to health-care services", "prenatal care" And among the cultural factors: "parents' literacy level", "number of children", "mother's nutritional behavior", "mother's knowledge and skill" and "use of educational media" are the most important factors that affect babies' malnutrition and affect growth disorder.

Conclusion: According to the obtained results, it is necessary for families, especially mothers, to learn educational and skill courses on nutritional behavior for infants and improve their awareness, and at the macro level, health policy makers in planning taking into consideration the living conditions of families, food security policies and allocating support packages to the poor, especially newborns.

Key words: infants, malnutrition, developmental disorder, feeding behavior: socio-economic factors, cultural factors, neonatal NICU department.

Mhaj9566@yahoo.com

Recent innovations of ultrasound technology in the structure of food ingredients

Ghazal Mehrad [1] , Hsasn Zaki Dizaji [2*]

1 Ph.D student,food science and Tecnology, Sari Agricultural Science and Natural Resources Univercity, Sari,Iran

2 Biosystems Engineering Dept., Faculty of Agriculture, Shahid Chamran University of Ahvaz, Ahvaz, Iran

Abstract: The use of ultrasonic waves is one of the emerging and non-destructive physical methods for measuring the quality of products, the development of which is facing serious challenges. Many researches conducted in the field of ultrasound have shown a wide range of its applications in food science and nanotechnology. However, like all new technologies, ultrasound has advantages and limitations that field and operational use on an industrial scale for some foods are difficult. The effect of ultrasonic waves on food depends on the physical and mechanical structural characteristics of the constituent

compounds. And their potential applications in modifying, determining and predicting the physicochemical properties of food and their composition structure have been considered. However, due to the complex structural features of most food ingredients, it is very difficult to determine the speed of ultrasonic waves in the structure and composition of foods analytically. In this review, an overview of the recent applications of high-power ultrasound waves in food is discussed, emphasizing the effect of high-power ultrasound waves on the structure of food compounds and their biological activities. Also, the effect of different ultrasound conditions such as frequency, intensity, duration, temperature and pressure, on the structural (physico-chemical) effect and material properties have also been stated. Ultrasound changes the structure of food due to the phenomenon of cavitation. In other words, it improves the reaction speed in food ingredients. Therefore, it shortens the duration of the operation as well as the energy consumption of the food processes without affecting their quality and final structure. In general, the application of ultrasound waves in food science has a great potential to create and change chemical structures. And its use as an innovative diagnostic system in various food applications can be discussed and investigated. However, in Iran, extensive basic studies for the industrialization of ultrasound have not been carried out, and only image and sound (acoustic) processing methods have been considered in some researches. Therefore, if the processing operation is intense, the compounds and nutrients of the food products may be lost under destructive processes. Therefore, ultrasound can be used as a new technology without destroying the texture and reducing the nutritional value of food products in various fields of the food industry.

Keywords: ultrasound, food structure, cavitation, food quality

*Corresponding auther: Hsasn Zaki Dizaji

gh.mehrad17@gmail.com

Leveraging artificial intelligence for advancements in the food industry: a comprehensive scoping review

Taleb Khodaveisi [1] , Nasim Aslani [2], Mohammad Hosseiniravandi [3], Mohammad Heydari [4]

1 Department of Health Information Technology, School of Allied Medical Sciences, HamadanUniversity of Medical Sciences, Hamadan, Iran.

2 Department of Health Information Technology, School of Allied Medical Sciences, Lorestan University of Medical Sciences, Khorramabad, Iran.

3 Department of Health Information Technology, School of Allied Medical Sciences, Torbat Heydarieh University of Medical Sciences, Torbat Heydarieh, Razavi Khorasan, Iran.

4 Instructor, Department of Health Information Technology, Khalkhal University of Medical Sciences, Khalkhal, Iran.

Background: The food industry holds a pivotal position in both national and global economies. Consequently, it is imperative to adopt cutting-edge technologies, including intelligent solutions powered by artificial intelligence, to guarantee food

quality, preservation, processing, and safety.

Methods: This study employed a scoping review methodology, examining articles from the past decade published in scientific journals and conference proceedings. The search was conducted across IEEE, PubMed, Scopus, and Web of Science databases using keywords such as “food industry”, “ food processing”,”food handling”, “food preservation”,” artificial intelligence” ,” computational intelligence”, and their respective synonyms.

Results: The findings of this study demonstrate that various subfields of artificial intelligence, including pattern recognition, fuzzy logic, data science, neural networks, deep learning, machine learning, and robotics, are being utilized in the food industry. Principal applications of artificial intelligence within the food industry encompass the optimization and surveillance of the entire supply chain process, forecasting of price and demand, management of logistics in an optimal manner, and enhancement of food safety and quality.

Discussion: Artificial intelligence, with its vast potential and capabilities, is poised to revolutionize the food industry by fostering more rational and optimal productivity. Its application in this field is not only transformative but also inevitable.

Keywords: Artificial intelligence, Food industry, food processing, Technology, Hygiene

Corresponding author: Mohammad Heydari

Heydari.mohammad12@yahoo.com