

ICOMHRE

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ANT ABSTRACT



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2nd INTERNATIONAL CONGRESS OF MULTIDISPLINARY HYGIENE RESEARCH

02 -04 October 2025, Kocaeli, Türkiye

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FOREWORD

Dear Rectors, Deans, Directors,
Esteemed Colleagues, Distinguished Speakers, and Valued Participants,

It is a great pleasure and honor to welcome you to the 2nd Multidisciplinary Hygiene Research Congress, hosted by Kocaeli University and organized in cooperation with Ankara Medipol University and the Life Sciences Academy. Building on the scientific outcomes of the first congress, this second gathering focuses specifically on the theme of "Food Safety and Public Health", addressing current and emerging challenges through a multidisciplinary perspective.

Food safety and public health are inseparable components of sustainable health systems. Access to safe food, clean water, adequate sanitation, and effective hygiene practices is essential for preventing foodborne diseases, protecting vulnerable populations, and promoting community well-being. In an increasingly interconnected world, risks related to food production, processing, distribution, and consumption have direct and far-reaching implications for public health.

Recent global experiences—including natural disasters, pandemics, climate-related crises, and humanitarian emergencies—have clearly demonstrated the critical role of food safety and hygiene systems in safeguarding public health. Disruptions in food supply chains, water and sanitation infrastructure, and health services significantly increase the risk of foodborne illnesses, malnutrition, and communicable diseases, particularly among children, older adults, and individuals with chronic conditions.

Food, water, and hygiene are universally recognized as fundamental human rights. As emphasized in the United Nations Declaration (2002), ensuring access to safe water and sanitation is a shared responsibility of states and all relevant stakeholders, both in times of peace and during disasters and emergencies. Strengthening food safety systems, hygiene awareness, and evidence-based public health practices is therefore vital for preparedness, resilience, and sustainable development.

Within this framework, the congress aims to promote scientific knowledge exchange, foster interdisciplinary dialogue, and contribute to the advancement of effective food safety and public health strategies. Particular emphasis is placed on topics such as food safety management systems (including HACCP), environmental hygiene, nutrition and public health, protection of vulnerable groups, and the integration of hygiene principles into education, policy-making, and professional practice.

We sincerely hope that this congress will serve as a productive platform for sharing expertise, discussing current challenges, and generating innovative solutions at the intersection of food safety and public health. I would like to extend my heartfelt thanks to all members of the organizing committee, the host institution Kocaeli University, our cooperating institutions, distinguished speakers, and all participants for their valuable contributions and support.
Wishing you a successful, inspiring, and scientifically fruitful congress. With my highest regards,

Prof. Dr. Nevin SANLIER
Congress Chairman
Ankara Medipol University Acting Dean of Faculty of Health Sciences



Dear Scientists,

Today, we have come together to address a vital issue that directly concerns public health: access to healthy food—one of humanity's most fundamental needs—and its safe consumption. As we all know, food is not merely a means of nutrition; it is also an indispensable component of healthy living, sustainable development, and societal well-being. However, in today's world, threats to food safety are becoming increasingly diverse. From microbiological risks to chemical contaminants, from the impacts of climate change on agriculture and food production to the new epidemic risks brought about by globalization, we are confronted with challenges across multiple domains.

It is estimated that foodborne diseases cause the deaths of more than 400,000 people worldwide each year, while waterborne diseases are responsible for approximately 2 million deaths, the majority of which occur among children. Moreover, nearly one in every ten people globally is affected by a foodborne illness each year. Rapid population growth, accelerated urbanization, globalization, profound changes in agricultural and food systems, climate change, deforestation, and the globalization of trade in domestic and wild animals and animal products all adversely affect food safety and facilitate the spread of food- and waterborne diseases. Today, approximately 75% of pandemics are zoonotic and related to food systems. Over the past four decades, the number of climate-related disasters has increased by more than 80%; events such as floods, storms, heat waves, and droughts have severely affected both ecosystems and health systems. This process has created favorable conditions for the expansion of vector distribution ranges, losses in food production, and the spread of water- and foodborne pathogens, thereby posing a direct threat to human health.

These changes in food safety and hygiene threaten not only human health but also plant, animal, and ecosystem health. Consequently, the close interrelationship among human, animal, and environmental health has placed the One Health approach at the center of global health security. The One Health approach is an indispensable strategy and an integral component of health policies for preventing future pandemics, climate-related disasters, and food crises, and for ensuring global health security.

The scale of global threats clearly demonstrates that the One Health approach cannot be confined to a single discipline or a regional framework. Effective management of risks to human, animal, and environmental health, as well as the sustainable provision of safe food, clean water, energy, and a healthy environment, is only possible through national and international cooperation. For this reason, our congress has brought together invited speakers and researchers from many different scientific fields related to food hygiene within a multidisciplinary framework. They have not only discussed existing problems but have also shared solutions and examples of best practices. I believe that this congress represents not merely a scientific event, but also an expression of our shared responsibility to leave a safer and healthier world to future generations.

I would like to extend my sincere thanks to all the scientists, institutions, and organizations who contributed, and especially to the organizing committee whose efforts made this congress possible.

Prof. Dr. Çiğdem ÇAĞLAYAN
Congress Term Chair
Department of Public Health, Kocaeli University



Distinguished Guests, Esteemed Academics, Dear Participants, and Students,

Welcome to the 2nd International Multidisciplinary Hygiene Research Congress (ICOMHRE), hosted by Kocaeli University in cooperation with Ankara Medipol University and the Academy of Life Sciences.

Our congress was first held on May 5–7, 2023, under the title *Congress on Hygiene Research in the Hospitality Industry (COHRIH)*. Organized in the immediate aftermath of the devastating earthquake centered in Kahramanmaraş, that congress addressed the theme of "Hygiene in Disasters," a topic of critical importance for public health. It holds the distinction of being the first national and international scientific event focusing specifically on hygiene research within the tourism sector. The congress featured 50 papers, 1 panel, 2 courses, and 1 workshop, providing a valuable platform where academics from diverse disciplines, local authorities, and industry representatives shared their knowledge and experiences.

This growing scientific accumulation and expanding participant profile have enabled our congress to gain a multidisciplinary identity, leading us to continue our journey under the name International Multidisciplinary Hygiene Research Congress.
Today, hygiene is no longer merely a technical issue; it is also a cultural value that directly affects public health, quality of life, and sustainable development. With this awareness, the main theme of this year's congress has been determined as "Public Health and Food Safety."

Over the course of two days, our congress will host 50 paper presentations, 6 panels, 2 courses, and 2 workshops, offering a rich and comprehensive scientific program.
On this occasion, I would like to express my sincere gratitude to all those who contributed to the realization of this congress:

- Kocaeli Metropolitan Municipality, Assoc. Prof. Dr. Tahir Büyükakın,
- Our Rector, Prof. Dr. Nuh Zafer Cantürk,
- The Congress Chair, Prof. Dr. Nevin Şanlıer,
- The Congress Term President, Prof. Dr. Çiğdem Çağlayan,
- The Mayor of Kartepe, Mustafa Kocaman,
- The Mayor of Körfez, Şener Söğüt,
- The President of the Academy of Life Sciences, Prof. Dr. Mehmet Karataş,
- The management of Konak Hospital, and Op. Dr. Kazım Gündoğdu,
- ISS Türkiye Kocaeli,
- Eyüp Sabri Tuncer,
- Limaş Port Operations Company,
- Our Organizing Committee, all supporting academics, public institutions, organizations, and valued stakeholders.

I wish you all a productive and inspiring congress. With my highest regards.

Assoc. Prof. Dr. Ömür ALYAKUT
Congress Coordinator
Kartepe Vocational School of Tourism



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ICOMHRE CONGRESS PROGRAM

02 OCTOBER 2025 -THURSDAY				
08.00 - 10.00	**Congress Registration (***Congress Hotel – Dedeman Kartepe, Kocaeli***)**			
10.00 - 11.00	**Opening and Protocol Speeches**			
11.00 - 12.15	**Online Conference** **Meeting Link:** *https://tinyurl.com/4nrxxbph* **Moderator:** *Prof. Dr. Çiğdem ÇAĞLAYAN, Kocaeli University* *Meeting Link: https://tinyurl.com/52nwjfjp* Food Hygiene and Public Health – *Prof. Dr. Çağatay GÜLER, Hacettepe University*			
12.15 - 13.15	**Lunch**			
13.30 - 15.00	**Panel 1: Current Hazards in Foods** **Moderator:** *Prof. Dr. Zeynep CANTÜRK, Kocaeli University* 1. **Pesticides and Food Hygiene** – *Prof. Dr. Seval Alkoy, Bolu Abant İzzet Baysal University* 2. **Climate Change and Food Hygiene** – *Asst. Prof. Dr. Alp Aker, Kocaeli University* 3. **Microbiological Hazards in Food** – *Prof. Dr. Aynur Karadenizli, Kocaeli University*			
15.00 - 15.15	**Coffee Break**			
	PANELS	**PRESENTATIONS**		**ONLINE PANEL**
15.15 - 16.30	**Ballroom A**	**Ballroom B**	**Lobby Hall**	**Kocaeli Hall**
	Panel 2: Responsibilities in Food Hygiene: Producer, Inspector, Consumer **Meeting Link:** *https://tinyurl.com/24s6fpyc* **Moderator:** *Prof. Dr. Aybüke CEYHUN SEZGİN*	**Moderator:** *Prof. Dr. Ayşe GÜNSEL*	**Moderator:** *Prof. Dr. Çiğdem ÇAĞLAYAN*	**Online Panel:** Current Interventions Regarding Food Hygiene in the World in terms of Public Health Meeting Link: *https://tinyurl.com/24s6fpyc* **Moderator:** *Prof. Dr. Sibel KIRAN*
	1. **Food Hygiene in Public Health** – *Prof. Dr. Mustafa TAYAR, Bursa Uludağ University* 2. **Food Hygiene** – *Prof. Dr. Nevzat ARTIK, Ankara University (Retired)* 3. **Food Hygiene in Restaurants in the US** – *Prof. Dr. Bendegül OKUMUŞ, University of South Carolina* 4. **Microplastics and Food Hygiene** – *Prof. Dr. Cavit Işık YAVUZ, Hacettepe University*	1. **Evaluating the relationship between nutrition attitudes, eating disorders, and body awareness among university students** – *Ahmet Furkan Süner, Recep Enes Çelik, Elif Örseloğlu, Çınar Erginbaş* 2. **Food safety and food security: Interrelated concepts for public health** – *Simay Kundakçı* 3. **As a food contaminant: Microplastics** – *Selen Akbulut, Ekin Çevik* 4. **The impact of environmental factors on water quality and food hygiene** – *Arzu Morkoyunlu, Şebnem Erkebay* 5. **Expressed human milk and hygiene: Importance for public health** – *Simay Kundakçı, Şule Aktaç*	1. **Occupational cancer risks in the extractive industry of Suceava County, Romania** – *Stanciu Oana Lorena, Cebanu Serghei* 2. **Determination of health beliefs and behaviors of men working in the marketplace regarding testicular self-examination and testicular cancer prevention** – *Nurcan Kolaç, Ebru Uslu* 3. **Physiologically based pharmacokinetic (PBPK) modeling of benzene, 1-bromopropane, and DEHP under acute, occupational and environmental exposure scenarios** – *Nurhan Emlik, Recep Kaya Göktaş* 4. **Hoarding disorder: Implications for hygiene, self-care, and public health** – *İlay Dalkıran, Fatma Seher Kocaayan, Nezihe Gül, Diğdem Göverti* 5. **Microplastics and cardiovascular disease risk** – *Hale Arık Taşyıkan*	1. **Food hygiene practices in the workplace** – *Dr. Mahmud Zouk, Unilever* 2. **Strengthening school food safety: Impact of hygiene training for food handlers in Semarang City** *Dr. Hanifa Maher Denny, Dr. S. M. Bakti Pertiwi, Diponegoro University* 3. **AI, decision and healthy work** – *Dr. Mark Johnson, Manchester University*
16.30 - 16.45	**Coffee Break**			



16.45 - 18.00	**Course - 1**	**Moderator:** *Prof. Dr. Hülya ÇEKMECELİOĞLU*	
	Investigation and Control of Foodborne Outbreaks – *Assoc. Prof. Dr. Melike YAVUZ, Kocaeli University*	1. **The first scientific studies on hygiene in the 19th Century: Health Conferences and decisions made in pilgrimage tourism** – *Yüksel Güngör* 2. **Folk medicine practices in Balıkesir: From tradition to the present** – *Samet Çevik, Melahat Yıldırım Saçılık* 3. **Sustainable gastronomy tourism: A public health and environmentally friendly production approach** – *Melahat Yıldırım Saçılık, Semih Sarıipek* 4. **Epidemics in the Ottoman Army and their impact on the Balkan Wars in historical background** – *Yüksel Güngör* 5. **Healing flavors: Evaluation of the Alaçatı Herb Festival in terms of health tourism** – *Semih Sarıipek, Samet Çevik*	
	Course - 2 **Literature Search and Knowledge Synthesis for Researchers** – *Prof. Dr. Sibel KIRAN, Koç University*		
All Day	**Workshop: Balllroom- Foyer** Hikmet Colognes – *Emine Olguntürk*		

03 OCTOBER 2025 – FRIDAY			
	PANELS	**PRESENTATIONS**	
09.30 - 10.45	**Panel 3: Technological Developments and Food Hygiene** **Moderator:** *Prof. Dr. Nil Pembe ÖZER*	**Moderator:** *Prof. Dr. Bilsen BİLGİLİ*	**Moderator:** *Prof. Dr. Suavi AHİPAŞAOĞLU*
	1. Use of Artificial Intelligence in Food Hygiene Applications – *Asst. Prof. Dr. Mutlu ÇELIK, Gebze Technic University* **2- Digital Transformation in Food Production Management** – *Ayşe MENTEŞE, Kalite Uzmanı, Leröy, Türkiye* **3- New Applications of Electrolyzed Water in the Food Industry** – *Prof. Dr. Nil Pembe ÖZER, Kocaeli University* **4- Fermentation-Driven Production of Industrial Enzymes from Fish Processing Waste: A Biotechnological Valorization Approach** – *Ndeye Fatou DIAGNE, Mine Nazan KERIMAK ÖNER, Nil Pembe ÖZER* **5- Smart Packaging Technologies for Enhanced Food Hygiene and Safety** – *Semin Özge KESKIN*	1. **Spent coffee grounds as a natural antimicrobial for food preservation and packaging** – *Ekin Çevik, Selen Akbulut* 2. **Evaluation of changes in nutrition and food consumption habits according to the findings of 2010 and 2017 Türkiye Nutrition and Health Surveys** – *İbrahim Kapan, Ahmet Alp Aker, Melike Yavuz, Çiğdem Çağlayan* 3. **When clean becomes extreme: A case report of food hygiene-related OCD** – *Nezihe Gül, Fatma Seher Kocaayan, İlay Dalkıran, Aila Gareayaghi, Sena Nur Kutluay* 4. **Hygiene and ISO 22000 applications in mass consumption places** – *Aybüke Ceyhun Sezgin, Nevzat Artık* 5. **Food hygiene practices in the aquaculture industry (Türkiye)** – *Arzu Morkoyunlu*	1. **The effects of excessive food hygiene during complementary feeding on gut microbiota and mental health** – *Fatma Seher Kocaayan, Nezihe Gül, İlay Dalkıran, Diğdem Göverti* 2. **A case of food-related contamination obsessions in obsessive- compulsive disorder** – *İsmail Emre Ak, Narmin İsayeva, Aila Gareayaghi* 3. **A rare case of trichophagia with Granddaughter's hair ingestion** – *Narmin İsayeva, İsmail Emre Ak, Sena Nur Kutluay, Aila Gareayaghi* 4. **The role of women in hygiene and invisible labor in coastal fishing communities** – *Şebnem Erkebay, Şükrü Satılmış, Cem Erkebay, Arzu Morkoyunlu* 5. **Epidemiological shifts of gastroenteritis pathogens identified with Multiplex PCR Between 2021 and 2024** – *Müge Toygar Deniz, Özlem Güler, Melih Berkay Esgin, Sıla Akhan*
10.45 - 11.00	**Coffee Break**		



11.00 - 12.30	**Panel 4: The Invisible Threat: Food and Our Health** **Moderator:** *Prof. Dr. Berrin ÇETİN ARSLAN*	**Moderator:** *Prof. Dr. Burcu CANDAN ÇAM*	**Moderator:** *Prof. Dr. Emrah ÖZKUL*
	1. Foods and Their Effects on the Endocrine System – *Asst. Prof. Dr. Mehmet SÖZEN, Kocaeli University* **2. Endocrine Disruptors in Foods and Their Effects on Child Health** – *Assoc. Prof. Dr. Gürkan TARÇIN, Kocaeli University* **3. Current Status of Foodborne Outbreaks** – *Asst. Prof. Dr. Özlem GÜLER, Kocaeli University* **4. The New Face of Eating Disorders: Ortoreksia** – *Lect. Dr Aylin GAREAYAGHI, Kocaeli University*	1. **Urban hygiene in the age of climate crisis: Vulnerable groups and social inequalities** – *Örgen Uğurlu* 2. **Evaluation of work accidents and occupational diseases occurring in workers working in the food sector in Turkey** – *Hüseyin Sami Toprak, Özge Arslan, Ahmet Alp Aker, Melike Yavuz, Çiğdem Çağlayan* 3. **Gender roles in cleaning product advertisements in the context of semiotic analysis** – *Ayşenur Kuytan* 4. **Analysis of postgraduate theses in the field of cleaning, hygiene and sanitation** – *Tülay Üzümcü, Şaban Sağlam* 5. **Collected in the Ottoman Empire in 1866 Istanbul Health Conference and its effects on public health** – *Yüksel Güngör*	1. **One health education' for sustainable hygiene in tourism** – *Rüştü Taştan* 2. **Integration of good agricultural practices and cross-contamination risks in home kitchens: a study focused on cutting board and knife use** – *Rabia Kulluk, Ömür Alyakut* 3. **From hygiene perception to brand value: Changing priorities in destinatıon marketing** – *Zeynep Genç* 4. **A study of the history of soap** – *Deniz Güçlü, Tülay Polat Üzümcü* 5. **A comparative study of the guardians of hygiene in myths** – *Deniz Güçlü, M. İbrahim Ethem Edin*
12.30 - 13.30	**Lunch**		
13.30 - 14.30	**Panel 5: Local Solutions in Food Safety** **Moderator:** *Assoc. Prof. Dr. Ömür ALYAKUT*	**Moderator:** *Prof. Dr. Muhsin HALİS*	
	1. Local Solutions in Food Security – *Fatma KANDAL, Körfez Municipality* **2. Food Control in Local Governments** – *Korhan Baran KILIÇARSLAN, Körfez District Directorate of Agriculture and Forestry* **3. Food Hygiene and Practices in Hızır 41 Disaster Kitchen** – *Yasemin ERGİN,* Kocaeli Metropolitan Municipality	1. **Strategic role of hygıene in maritime transportation: Health, safety, and sustainability** –*Şükrü Satılmış, Şebnem Erkebay, Cem Erkebay* 2. **Food hygiene and sanitation: Current challenges and future perspectives** – *Gülşen Bayat* 3. **Hygiene requirements in the cooling and reheating stages of food in businesses producing mass meals** – *Aybüke Ceyhun Sezgin, Meltem Kozan Bezci* 4. **The role of cologne in traditional hygiene and cleanliness culture: The example of wisdom cologne as a local brand** – *Ömür Alyakut, Tülay Polat Üzümcü, Deniz Güçlü* 5. **A review of the interdisciplinary development of hygiene research**– *Mehmet Boyraz*	
14.30 - 14.45	**Coffee Break**		
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14.45 - 16.00	**Hand Hygiene in Foodborne Outbreaks –** *Asst. Prof. Müge TOYGAR DENİZ, Kocaeli University*		
16.00 – 17.15	**Food Hygiene and Safety at Home: Proper Storage and Cooking Techniques –** *Asst. Prof. Dr. Nur Dede, Kocaeli University*		
19.30	**Gala Dinner**		
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14.00	**Lunch**		
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ABSTRACTS



Food Hygiene In Public Health

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Abstract

Food hygiene is one of the fundamental factors that directly influences the health status of individuals within society. Adherence to hygiene rules during the production, processing, transportation, and consumption of food plays a crucial role in preventing the spread of diseases. In this regard, ensuring hygiene is not limited solely to personal cleanliness; it also involves compliance with appropriate standards in production environments, equipment, packaging materials, and storage areas. Furthermore, preventing contamination of food materials with microorganisms or maintaining microbial growth under control is of critical importance for the protection of public health.

Food hygiene represents a continuous and systematic process aimed at preventing food spoilage and inhibiting the proliferation of pathogenic microorganisms. Within this framework, maintaining appropriate temperature levels, ensuring time control, managing environmental conditions, and promoting personnel hygiene constitute some of the core principles. In particular, controlling microorganisms in food is among the most effective strategies for preventing hygiene-related diseases. For this purpose, regular cleaning and disinfection practices, optimal environmental conditions in production and retail areas, and strict adherence of employees to hygiene regulations are of paramount importance.

The methods and principles applied in food hygiene are designed to ensure that food remains safe and wholesome by both preventing microbial growth and minimizing physical and chemical contamination. Therefore, the implementation of hygiene standards throughout the entire food chain, from production to consumption, contributes significantly to preventing the spread of microorganisms that threaten public health and reducing the risk of foodborne diseases. Conscious hygiene practices and regular inspections are among the cornerstone measures for safeguarding public health.

Keywords: Food hygiene, public health, food safety.



From Hygiene Perception To Brand Value: Changing Priorities In Destination Marketing

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Abstract

The tourism sector is among the industries most vulnerable to global crises, where shifts in consumer expectations and risk perceptions rapidly reshape destination preferences. In recent years, hygiene has moved beyond being a secondary consideration and has emerged as a central factor in destination marketing. Hygiene perception plays a crucial role not only in ensuring individual health and safety but also in shaping destination brand image, communication strategies, and competitiveness. Accordingly, this study aims to conceptually explore the transition from hygiene perception to brand value and to highlight the changing priorities in destination marketing. A systematic review of the literature on tourism marketing, destination branding, tourist behavior, and hygiene perception was conducted, and the findings were analyzed within a conceptual framework. The review reveals that hygiene perception has expanded from a short-term crisis management issue to a long-term determinant of brand strategies, tourist loyalty, and revisit intentions. Furthermore, while existing research often emphasizes immediate pandemic-related impacts, comprehensive studies linking hygiene to destination identity, sustainability, and value creation remain limited. This study contributes to the literature by positioning hygiene perception as a fundamental dimension of destination marketing and by providing a conceptual framework for understanding its role in shaping brand value. It also offers practical implications for destination management organizations, suggesting that hygiene-focused marketing strategies can enhance competitiveness and strengthen long-term trust in destinations.

Keywords: Hygiene Perception; Brand Value; Destination Marketing; Tourist Behavior; Image



The Impact of Environmental Factors on Water Quality and Food Hygiene

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Abstract

Water quality and food hygiene play a critical role in protecting public health. This study examines the effects of environmental factors—particularly climate change, industrial pollution, agricultural activities, and waste management practices—on the quality of water resources and food safety. Rising temperatures and irregular precipitation patterns increase the risk of microbial contamination, while the use of pesticides and fertilizers in agriculture leads to the accumulation of chemical residues in water bodies. Inadequate treatment of wastewater further negatively affects both drinking water and agricultural irrigation quality. The use of low-quality water can result in the contamination of food products with pathogenic microorganisms such as *Salmonella* spp., *Escherichia coli*, and *Listeria monocytogenes*, posing serious public health threats. According to 2021 data from the European Food Safety Authority (EFSA), approximately 12% of reported foodborne outbreaks were linked to contaminated water. These environmental impacts cause microbial and chemical contamination in food products, either directly or indirectly, thereby increasing the risk of foodborne illnesses. In this context, the importance of sustainable environmental management policies, integrated water resource management, and strict food hygiene monitoring becomes increasingly evident. This study emphasizes that controlling environmental factors is vital not only for environmental health but also for the overall well-being of society.

Keywords: Water quality, food hygiene, environmental factors, pollution, public health, climate change

Food Hygiene Practices in the Aquaculture Industry (Türkiye)

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Abstract

The seafood industry is obligated to adhere strictly to hygiene standards in order to provide consumers with safe, healthy, and high-quality products. Preventing foodborne illnesses and ensuring the consistent preservation of product quality necessitate the implementation of hygiene practices at every stage of the production process, grounded in systematic and scientific principles. In this context, personnel hygiene constitutes a fundamental priority. Employees who are in direct contact with food must maintain high standards of personal cleanliness, utilize appropriate protective clothing, and follow stringent hand hygiene protocols under continuous supervision. Moreover, the regular cleaning and disinfection of processing areas, equipment, and contact surfaces play a critical role in maintaining environmental hygiene. Throughout the entire supply chain—from raw material acquisition to final consumption—the uninterrupted maintenance of the cold chain is essential to prevent microbial contamination. During storage and transportation, the monitoring of temperature, ensuring the hygiene of packaging materials, and implementing measures against cross-contamination are indispensable for food safety. Additionally, routine microbiological testing is crucial for evaluating the effectiveness of hygiene protocols. Monitoring for pathogens such as *Salmonella spp.* and *Listeria monocytogenes*, and systematically recording test results, are integral components of a robust risk management strategy. The implementation of food safety management systems (e.g., HACCP, ISO 22000) and full compliance with relevant legal regulations are vital for ensuring quality assurance in both domestic and export markets. In conclusion, hygiene practices in the seafood industry are not merely legal obligations but also represent a strategic necessity for safeguarding public health and enhancing the credibility and reliability of the sector.

Key Words: Aquatic products, food hygiene, HACCP, food legislation, ISO 22000



The First Scientific Studies On Hygiene In The 19th Century: Health Conferences And Decisions Made In Pilgrimage Tourism

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Abstract

Hygiene is essential today. We are still experiencing the discomfort, anxiety, and restrictions created by the Covid-19 pandemic. One of the earliest signs of personal hygiene awareness emerged in 3000 BC. Historians believe that in 2000 BC, humans first discovered how to purify water—that is, boil it to kill bacteria.

He believes that humans first discovered how to purify water, namely by boiling it to kill bacteria, first in Mesopotamian texts and later in documents discovered by historians around 2000 BC. The germ theory of disease was only discovered hundreds of years later in the second half of the 19th century, in the 1860s, by French chemist and microbiologist Louis Pasteur, English surgeon Joseph Lister, and German physician Robert Koch. They discovered that some diseases were caused by microorganisms invading the human body. In parallel with the advances in medicine in this century, significant advances in hygiene occurred at health conferences in the 19th century.

From the invention of writing to the present day, some places around the world have hosted close relationships between different cultures, civilizations, and religions. Our research field, "pilgrimage tourism," has undergone rapid development since the Middle Ages and has been affected by global epidemics. Health conferences, which began to be held in the mid-19th century, first influenced pilgrimage tourism through their emphasis on hygiene.

In this study, we will examine in detail the measures taken regarding hygiene conditions in pilgrimage tourism and their implementation.

Keywords: Tourism, Hajj, Hygiene, Conference, History

Collected In The Ottoman Empire In 1866 "Istanbul Health Conference"And Its Effects On Public Health

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Abstract

In the first half of the nineteenth century, an epidemic known as cholera spread across Europe and the rest of the world. Alongside cholera, other epidemics also produced significant political, social, and economic consequences and became important determinants in the development of health systems. Thanks to cholera, quarantine became widespread, protective practices were laid as the foundations of health organization and the infrastructure of cities was improved.

Our research area is the Ottoman Empire 19.at the beginning of the century, while dealing with diseases such as plague, smallpox, malaria, tuberculosis, he soon encountered cholera. Studies in the field of health; II.The Tanzimat Period, which begins with the reign of Mahmud, is followed by the period symbolized by Mustafa Reşid Pasha, A.Cevdet Pasha, Mehmed Emin Ali Pasha and Keçecizade Fuat Pasha.

The Istanbul Conference has been an extremely important health conference. From the point of view of cholera, the discussions 20. it continued until the century. The contagiousness of the disease, incubation period and quarantine measures were generally accepted. As a result of these developments, measures taken regarding public health came to the fore.

Sultan Abdulaziz awarded the cholera medal to the physicians and other staff who provided service during the epidemic in 1865 and to the foreign delegates who attended the 1866 conference. What remained from this conference was the "service medal" given for the first time in the field of health and a series of decisions taken on public health that left their mark on the meeting.

Keywords: Cholera, Quarantine, Istanbul, Public Health, Conference



A Comparative Study of the Guardians of Hygiene in Myths

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Abstract

This study aims to examine the divine representations of hygiene and preventive health in the mythological narratives of different cultures. In ancient societies, cleanliness and hygiene were considered not only physical practices but also concepts associated with spiritual purification, sanctity, and the preservation of social order. In this context, hygiene gods and goddesses appear as figures symbolizing the continuity of social order and cosmic balance, as well as individual health. The primary objective of this study is to reveal the cross-cultural similarities and differences between mythological hygiene figures, demonstrating that hygiene has not only biological but also symbolic, social, and religious dimensions. A comparative mythology approach was adopted as the methodology, selecting Hygieia from Ancient Greece, Salus from Rome, Dhanvantari from Indian culture, Ma'at from Egypt, and Umay Ana from Turkish mythology as exemplary figures. These figures were analyzed through literature review and iconographic analysis, and the cultural and social functions of cleansing and purification rituals were comparatively evaluated.

The study concluded that mythological representations of hygiene are mostly personified through feminine figures, associated with concepts such as fertility, protection, and the maintenance of order. Furthermore, these figures continue to influence modern health symbols and folk beliefs. Thus, it is concluded that mythological hygiene gods and goddesses reflect cultural codes that have shaped both individual and societal understandings of health throughout history.

Keywords: Hygiene, Mythology, Hygieia, Salus, Umay, Cross-Cultural Comparison

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Title A Study of the History of Soap

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Abstract

This study aims to examine the historical development of soap, its use in different cultures, and the evolution of production techniques over time. Soap, in addition to being a fundamental element of hygiene, has also become an important product from an economic and cultural perspective with the advancement of civilization. This study will examine archaeological evidence regarding the first appearance of soap, production methods in ancient Mesopotamia, Egypt, Rome, and the Islamic world, and developments following the Middle Ages and the Industrial Revolution.

This research will utilize historical analysis. Information on the history of soap will be evaluated in light of archaeological excavations, ancient texts, written sources, and scientific articles. References to soap in Mesopotamian tablets and Roman inscriptions will be examined, and the development of the soap industry in Europe will be compared with production techniques developed in the Islamic world. Furthermore, sources on soap production and trade during the Ottoman period will be analyzed.

The research is expected to reveal that soap was used not only for cleansing purposes but also in medicinal and religious rituals. It is also anticipated that soap production was initially made using vegetable and animal fats, but advances in chemistry have led to the development of modern soap production techniques. Finally, the process of soap's transformation from a luxury item to an indispensable part of daily life will be evaluated.

Keywords: Hygiene, Cleaning Tradition, Cultural History



Epidemics In The Ottoman Army And Their Impact On The Balkan Wars In Historical Background

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Abstract

In a time when diseases weren't fully defined in medicine, hygiene conditions were among the factors that affected not only daily social life but also the warfare of armies that constituted their military power. Among the places where epidemics, which have been prevalent throughout history, were the regions ruled by the Ottoman Empire.

The disadvantage of its vast geography led to the spread of diseases such as plague, malaria, smallpox, cholera, and syphilis in many regions of the empire. The impact of epidemics was clearly evident in the many wars of the 17th and 18th centuries. The coincidence of epidemics with the many wars of the 18th and 19th centuries caused difficulties in recruiting soldiers from the provinces to join the army. One of the most pressing needs of the state, especially during wartime, was the thorough preparation of soldiers before campaigns.

However, the presence of epidemics made it difficult to recruit soldiers. Indeed, during epidemic periods, mass deaths, the rapid spread of disease, and the displacement of people from their home regions were among the primary factors that made joining the army difficult. During the Balkan Wars at the beginning of the 20th century, cholera outbreaks among soldiers negatively impacted the course of the war. Among the factors that led to the "Balkan Disruption," which marked the greatest rupture in our history, we will evaluate the effects of the cholera epidemic, which occurred outside the control of the army.

Keywords: Cholera, Soldier, Balkan Wars, Ottoman, Quarantine



'One Health Education' for Sustainable Hygiene in Tourism

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Abstract

As in history, the tourism sector faced emerging pathogens, the agents of global microbial threats, and pandemic outbreaks with enormous socioeconomic burdens in the first quarter of the 21st century. Profoundly impacted by epidemics, climate disasters, and global mobility, tourism has been forced to shift its approaches to sustainable hygiene, food safety, biosecurity, and public health. The COVID-19 pandemic, in particular, has demonstrated the significant damage tourism suffers from health threats triggered by dynamics at the interface of humans, animals, the environment, and ecosystems. Like the epidemics of the last quarter century, this latest pandemic has demonstrated the need to integrate the One Health Mindset and One Health Education, rooted in its principles, into tourism education. The aim of this study is to present a theoretical framework for the development of "Sustainable Hygiene and One Health Education" in tourism faculties, thereby promoting One Health awareness in the sector, and emphasizing the necessity of One Health Education. In the traditional approach, priority is given to food safety protocols, hygiene standards, and biosecurity measures in tourism education and the sector. However, the damage caused by climate change, emerging zoonoses, and other infectious diseases in tourism destinations over the last quarter century has become a serious socioeconomic problem. For all these reasons, it is emphasized that developing a One Health Education curriculum for tourism students will contribute to sustainable destination management in the sector and the development of tourism policies resilient to potential multiple crises. Therefore, effective One Health Education, developed through interdisciplinary collaboration to address health problems that may pose dynamic microbioecological threats to the tourism sector, is vital. This need and awareness will ensure the widespread adoption of a sustainable hygiene culture in tourism, the protection of public health against microbial risks and threats, and the achievement of the Sustainable Development Goals. In summary, as an effective communication tool, One Health Education, with its potential for critical thinking and the ability to convey a holistic health approach to the sector, will open new doors to awareness in tourism and its governance, adding significant socioeconomic value to the sector.

Keywords: Tourism, Pandemic outbreaks, Sustainable Hygiene, One Health Education, Climate Change, Food Safety



Strategic Role Of Hygiene In Maritime Transportation: Health, Safety, And Sustainability

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Abstract

Maritime transportation is a cornerstone of global trade and tourism. Ensuring hygiene on ships and yachts is critical not only for the health of passengers and crew but also for the continuity and sustainability of international maritime operations. This study explores hygiene management on ships and yachts within the framework of international standards, practical applications, and health implications. Regulations established by the International Maritime Organization (IMO), the World Health Organization (WHO), and the Centers for Disease Control and Prevention (CDC) are analyzed. Key areas such as food and beverage safety, water sanitation, waste management, personal hygiene, and environmental hygiene are examined. A review of the literature and case studies-particularly norovirus and COVID-19 outbreaks on cruise ships-demonstrate that deficiencies in hygiene management can result in severe health, safety, and economic consequences. Furthermore, the potential of technological innovations, including IoT-based monitoring systems and artificial intelligence applications, to enhance hygiene standards is discussed. The study concludes that hygiene on ships and yachts is not merely a health issue but also a strategic factor for safety, environmental protection, and the sustainability of the tourism economy.

Keywords: Hygiene; Ships; Yachts; Maritime Health; IMO (International Maritime Organization); HACCP (Hazard Analysis and Critical Control Points); Infection Control

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Food Safety and Food Security: Interrelated Concepts for Public Health

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Abstract

Food safety refers to the prevention of biological, chemical, and physical hazards that may compromise food integrity, while food security ensures consistent access to sufficient and nutritious foods. These domains are interconnected: without safety, food security cannot be realized, and without security, populations may rely on unsafe or low-quality foods. Both are global public health priorities, contributing to disease prevention, nutritional adequacy, and overall well-being. This study emphasizes their interrelationship and combined significance for sustainable health improvements.

Evidence from peer-reviewed studies and public health reports was synthesized thematically to illustrate the joint impact of food safety and security on nutrition and disease prevention.

Findings indicate that unsafe foods negate the benefits of adequate nutrition, while food insecurity forces vulnerable groups to rely on low-cost products that elevate chronic disease risk. Globally, millions suffer from foodborne illness each year, with pathogens as leading contributors. Meanwhile, food insecurity persists due to poverty, climate change, biodiversity loss.

Food safety and food security must be addressed concurrently within public health strategies. At the household level, safe storage and preparation reduce foodborne illness and support dietary adequacy. Community initiatives enhance access to healthy foods but often face regulatory and infrastructural limitations. Addressing both dimensions together is essential for sustainable outcomes. Regulations must secure reliable access while reducing risks from contamination, fostering healthier populations, reducing inequities, and building resilient food systems capable of withstanding environmental and socioeconomic pressures.

Keywords: Food safety; Food security; Public health; Nutrition.



Expressed Human Milk and Hygiene: Importance for Public Health

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Abstract

Human milk is a unique source of nutrients, hormones, and immunological factors. The WHO recommends exclusive breastfeeding for the first 6 months; however, when breastfeeding is not possible, expressed human milk is used. Therefore, hygiene, storage, and preparation processes become critical. For premature infants in particular, the risk of contamination can lead to serious complications such as sepsis and necrotizing enterocolitis.

This report reviews published systematic reviews, clinical protocols, and guidelines on human milk expression and hygiene and evaluates standard procedures.

It has been determined that human milk expressed at home has a higher bacterial load and that hand washing and equipment sterilization before expression are infrequent. It has been shown that as the storage time of expressed human milk increases, there are losses in its content, which may increase the risk of bronchopulmonary dysplasia in premature infants.

Before pumping, hands should be washed with soap and warm water and dried with a single-use towel. Equipment used for expressing human milk (nipple shield, valve, bottle, etc.) should be washed with hot water and detergent after each use, rinsed, and left to dry. Equipment for premature babies should be sterilized at least once a day. During pumping, do not touch the inside of the container/bottle and use BPA-free containers. After pumping, write the date and time on the container. Storage rules: 4 hours at room temperature (≤25 °C), 4 days in the refrigerator (≤4 °C), 6 months in the freezer (≤-18 °C). Thawed human milk should be used within 24 hours and should not be refrozen. If respiratory symptoms are present, a mask should be worn during pumping/transfer. If human milk is to be transported, it must be transported without breaking the cold chain.

Contamination can lead to fatal complications such as gastrointestinal infection and sepsis, especially in premature babies. Lack of knowledge and poor hygiene during home expression increase the risks, while trained personnel, central preparation rooms, and labeling practices in the hospital environment minimize these risks.

Keywords: Expressed human milk, Hygiene, Breastfeeding, Infant Health, Public Health

AI, Decision and Healthy Work

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Abstract

This session will examine how artificial intelligence can support decision-making in food hygiene and safety. I will outline the nature of AI technologies, illustrate potential applications in monitoring, risk assessment, and regulatory compliance, and discuss the ethical and organisational challenges they raise.

Drawing on our experience with the THOR occupational health surveillance project, I will highlight data-related considerations and the ways technological structures shape decisions, with the aim of strengthening public health protection in food environments.

Keywords: Artificial Intelligence; Food Hygiene and Safety; Decision-Making Systems



An Examination Of The Interdisciplinary Development Of Hygiene Research

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Abstract

Hygiene has historically become a research field that is not limited to the field of health; it has developed in interaction with many disciplines such as education, sociology, environmental sciences, and psychology. Today, the concept of hygiene is addressed across a broad spectrum, from individual behavior to the shaping of social policies, and is examined through interdisciplinary approaches. In this context, questions such as how hygiene research is represented in the scientific literature, which disciplines it intersects with, and how it has evolved over time are gaining importance. The primary objective of this study is to examine the interdisciplinary development of scientific production on hygiene and to reveal the reflections of this development in academic literature. The research was conducted using scientific studies in the Council of Higher Education (YÖK) Academic database, based on academic production in Türkiye. The data examined covers the period from the database's inception to February 2025. This broad period provides an important basis for analyzing the historical development and interdisciplinary trends of hygiene research. The research was structured within a qualitative research paradigm and employed a document analysis design. The research population consisted of hygiene-themed scientific studies in the YÖK Academic database. The sample consisted of interdisciplinary publications selected from this population using purposive sampling. Content analysis was used to analyze the data, systematically examining the fields in which the studies were published, their levels of interdisciplinary interaction, key concepts, and thematic orientations.

Keywords: Hygiene studies; interdisciplinary research; content analysis; multidisciplinary approach.



Determination of Health Beliefs and Behaviors of Men Working in the Marketplace Regarding Testicular Self-Examination and Testicular Cancer Prevention

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Abstract

PURPOSE: Testicular cancer is one of the most common cancers, especially in young adult men. Early diagnosis increases treatment success and positively impacts prognosis. This descriptive study aimed to determine men's knowledge, health beliefs, and behaviors regarding testicular cancer and testicular self-examination.

METHOD: The study was conducted with 200 adult men in the Gaziosmanpaşa district of Istanbul between January and July 2025. Data were collected using a 23-item descriptive questionnaire developed by the researcher and the Champion Health Belief Model Scale, via face-to-face interviews at the participants' local market. Data were analyzed using a computer-aided statistical package. The socio-demographic characteristics of the participants were analyzed using numbers and percentages, independent samples t-tests, ANOVA, Pearson correlation, Pearson chi-square, mean, and standard deviation tests.

RESULTS: 65.5% of the participants had never heard of testicular self-examination before. 47% of the participants had a family member diagnosed with cancer. 5.5% of the participants perform testicular self-examination once a month. The self-efficacy score of individuals with a family history of cancer ($\bar{X}$ = 3.44) was found to be higher than those without ($\bar{X}$ = 3.08). In the sensitivity dimension, participants who were knowledgeable about CCTM ($\bar{X}$ = 2.67) had a higher mean score than those who were not ($\bar{X}$ = 2.30), and this difference was found to be significant ($t(198) = 2.231$, $p = .027$). In the seriousness dimension, the mean score of individuals with knowledge ($\bar{X}$ = 3.39) was higher than those without knowledge ($\bar{X}$ = 2.91), and the difference was significant ($t(198) = 2.705$, $p = .007$). In the benefits dimension, the score of informed individuals ($\bar{X}$ = 3.58) was found to be significantly higher than the score of uninformed individuals ($\bar{X}$ = 3.14) ($t(198) = 3.346$, $p = .001$).

CONCLUSION: Participants' lack of knowledge negatively affected their health beliefs and behaviors regarding testicular cancer prevention.

Keywords: Testicular cancer, Testicular self-examination, Early diagnosis, Health belief model

Occupational cancer risks in the extractive industry of Suceava County, Romania

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Abstract

Introduction. Cancer for which a direct causal link with exposure to a carcinogen at work can be proven is defined as occupational cancer. In the European Union, about 23% of employees (32 million) are exposed to such agents, with mining being one of the high-risk sectors.

Objective. To evaluate the geographical and geological characteristics of mining areas in Suceava County, Romania in order to identify and map occupational exposure risks to carcinogens among underground workers.

Materials and Methods. A cross-sectional observational study was conducted on enterprises within the extractive industry of Suceava County, Romania. Mining perimeters were mapped, and potential carcinogenic hazards were determined based on rock composition and underground working conditions.

Results. The extractive industry in Suceava County comprises 37 mines, of which 12 (32.5%) currently exploit mineral resources. Uranium ore (Crucea-Botușana) represents a proven carcinogenic hazard, while polymetallic ores (Manaila, Iacobeni) pose significant risks. Other extracted materials, such as andesite, dolomite, manganese ore, common clay, peat, and mud, are not directly carcinogenic but may present indirect health risks. Rock salt (Cacica) is non-carcinogenic, however, underground mining conditions may still result in exposure to hazardous agents.

Conclusion. Mining activities in Suceava County involve both direct and indirect oncological risks. Continuous health monitoring of employees and systematic assessment of workplace conditions are crucial for developing and implementing effective preventive measures.

Keywords: Occupational health; occupational cancer; oncological risk; mines



The Potential of Spent Coffee Grounds as a Natural Antimicrobial Agent in Food Preservation and Packaging

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Abstract

As one of the most widely consumed beverages worldwide, coffee generates millions of tons of spent coffee grounds (SCG) annually, which are rich in dietary fiber, polysaccharides, protein, minerals, and bioactive compounds such as caffeine, chlorogenic acid, and melanoidins. This composition provides strong antioxidant and antimicrobial properties, highlighting their potential as a food additive and active packaging material. Recent studies on the antimicrobial and antioxidant properties of SCG have offered important findings from the perspective of food safety and hygiene. In this review, current literature was examined using the keywords “spent coffee grounds,” “used coffee grounds,” “antioxidant,” “food preservation,” “food protection,” and “shelf life” in the ScienceDirect, Web of Science, and Google Scholar databases. Literature findings indicate that SCG extracts can prolong the shelf life of various food products, including baked goods, oils, and meat, by slowing lipid oxidation. In addition, they exhibit antimicrobial activity against foodborne pathogens such as Listeria monocytogenes and Escherichia coli. Furthermore, it has been reported that edible films and coatings developed by combining SCG with chitosan, alginate, or polylactic acid (PLA) based biopolymers delay spoilage and reduce microbial load in various foods, ranging from fresh fruits to meat products. In conclusion, evaluating SCG as a food additive or active packaging component contributes to waste management and offers a natural and sustainable alternative in food safety. Thus, the reuse of coffee waste stands out as an innovative approach in hygiene and food protection strategies.

Keywords: coffee grounds; antimicrobial agent; food safety; active packaging; sustainability



As a Food Contaminant: Microplastics

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Abstract

Microplastics (MPs) have emerged as significant environmental and food contaminants in recent years. They are formed when plastics released into the environment break down into micro- and nano-sized particles due to sunlight, rainfall, water currents, and other environmental factors. Although their size can vary, they are generally defined as plastic particles smaller than 5 mm. Individuals are typically exposed to microplastics through ingestion, inhalation, and direct contact. Numerous studies have documented the presence of MPs in food, establishing them as notable food contaminants. This review surveys current literature from ScienceDirect, Web of Science, and Google Scholar using the keywords ‘microplastic,’ ‘presence of microplastic in food,’ and ‘food contaminant,’ focusing on microplastic contamination in food and its associated physical, chemical, and microbiological risk factors. While early research focused primarily on aquatic ecosystems, more recent studies have demonstrated the presence of MPs in a wide range of foods, including meat, dairy products, beverages, and fresh fruits and vegetables. Microplastic contamination can occur during raw material sourcing, production processes, and food packaging. In addition to chemical migration from packaging materials, microplastic transfer from plastic packaging has also been documented. Ongoing studies aims to clarify the effects of dietary microplastic exposure on human health, including their absorption, metabolism, and excretion. The detection of MPs in feces, placenta, blood, and even human milk underscores the magnitude of this issue.

Keywords: microplastic;nanoplastic;food security; food contaminants



Evaluation of Changes in Nutrition and Food Consumption Habits Based on the Findings of the 2010 and 2017 Turkey Nutrition and Health Surveys

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Abstract

Introduction-Objective

The most comprehensive studies assessing the nutrition and health status of individuals in Turkey are the Turkey Nutrition and Health Surveys (TBSA) conducted in 2010 and 2017. The aim of our study is to evaluate changes in food consumption habits among individuals in Turkey over a seven-year period, based on findings from the TBSA 2010 and TBSA 2017 data.

Materials and Methods

This study is descriptive in nature, and the data were obtained from the TBSA 2010 and 2017 reports published by the Ministry of Health, General Directorate of Public Health. IBM SPSS Statistics 21.0 software was used to evaluate the findings. As the research data were obtained from publicly available reports, no additional ethics committee approval was required.

Findings

Women constituted the majority of shoppers in both years, with the ratio falling from 58.4% in 2010 to 56.5% in 2017. In 2010, the expiration date (73.7%), price (65.5%), and brand reliability (49.2%) were the most important factors, while in 2017, these rates decreased to 40.6%, 24.5%, and 31%, respectively. Meat consumption increased from 69.3% to 86.8%, legumes from 9.1% to 14.9%, and fats from 32.8% to 50.2%. Cholesterol intake rose from 217 mg to 250 mg, while sodium intake increased from 2021 mg to 4181 mg.

Results

While the frequency of consumption of meat, dried legumes, and fats increased, a decrease in the frequency of fish consumption was observed. A decrease in the frequency of use of steaming and boiling methods, which are considered healthy, is also noteworthy. The doubling of daily sodium intake and the increase in cholesterol intake, along with the increased consumption of processed foods and fast food, are noteworthy. Repeating studies such as TBSA at shorter intervals will allow for closer monitoring of changes in food consumption habits in society.

Keywords: Nutrition, TNHS, consumption habits, food



Physiologically Based Pharmacokinetic (PBPK) Modeling Of Benzene, 1-Bromopropane, And DEHP Under Acute, Occupational And Environmental Exposure Scenarios

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Abstract

Industrial and environmental chemicals such as benzene, 1-bromopropane, di(2-ethylhexyl) phthalate (DEHP) are of concern due to their potential adverse health effects. Accurate assessment of internal exposure is essential for evaluating chemical risks in both occupational and environmental contexts. This study aims to apply physiologically based pharmacokinetic (PBPK) modeling to simulate acute, occupational, and environmental exposure scenarios of benzene, 1-bromopropane, and DEHP. Simulations will be performed using multiple PBPK platforms, including PK-Sim, IndusChemFate, and a spreadsheet model using a fugacity-based compartmental modeling approach. Each platform incorporates physiological compartments and chemical-specific parameters to describe absorption, distribution, metabolism, and excretion (ADME) processes. Occupational scenarios such as inhalation of benzene and 1-bromopropane at workplace-relevant concentrations, and environmental scenarios such as oral intake of DEHP through food, will be represented. In addition to occupational and environmental exposures, acute high-level exposure scenarios will also be simulated to illustrate short-term dose-time relationships. Comparative evaluation of the models will be carried out to explore predictive performance, advantages, and limitations. Although the study is ongoing, the expected contribution is to demonstrate the applicability of PBPK modeling in environmental health research. By integrating different tools and exposure routes, this work will provide a framework for improving chemical risk assessment and supporting science-based regulatory decisions.

Keywords: Benzene, 1-bromopropane, DEHP, environmental risk assessment, occupational exposure, PBPK modeling



Urban Hygiene in the Age of Climate Crisis: Vulnerable Groups and Social Inequalities

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Abstract

Climate change has become a multidimensional crisis that affects not only the environment but also social structures, the economy, and public service systems. The increasing frequency and severity of extreme weather events threaten the sustainability of natural resources and intensify the pressure on access to water, food, and healthy environmental conditions. This situation creates severe inequalities in the sustainability of hygiene, particularly for vulnerable urban populations. In this context, the study examines the impacts of the climate crisis in urban areas through the lenses of urban hygiene and environmental justice. While hygiene is traditionally associated with individual health and cleanliness, this study adopts a broader perspective, framing it as a public issue involving access to water, waste management, food security, access to green spaces, and healthy environmental conditions. Infrastructure deficiencies and spatial inequalities in cities are exacerbated by the effects of climate change; heatwaves, floods, and droughts increasingly hinder access to environmental services, especially for vulnerable groups such as low-income residents, migrants, women, children, the elderly, and persons with disabilities. The theoretical framework of the study is based on the concepts of environmental justice and urban resilience. Drawing on the WASH (Water, Sanitation, Hygiene) approach, the research analyzes the multidimensional relationship between climate change and hygiene services. The discussion section critically evaluates current environmental policies and local government practices, emphasizing the need for justice-oriented, participatory, and inclusive service planning. The study concludes that urban hygiene is not only a health issue but also a matter of social equity and environmental justice, and it offers multi-level policy recommendations for local governments.

Keywords: Urban hygiene; Climate crisis; Environmental justice; Vulnerable groups



Epidemiological Shifts of Gastroenteritis Pathogens Identified with Multiplex PCR Between 2021 and 2024 PZR ile Analizi

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Abstract

Introduction: Gastroenteritis is a significant public health problem worldwide that can lead to serious complications, particularly in individuals with weakened immune systems, including children and the elderly. The purpose of this study was to evaluate the causative agents identified in patients with gastroenteritis from 2021 to 2024 and to examine changes in the epidemiology of diarrhea.

Method: Multiplex polymerase chain reaction (PCR) gastrointestinal panel results for patients who presented to our hospital with gastroenteritis between January 2021 and December 2024 were retrospectively screened. A comparison was made of the pathogens detected in 2021-2022 and 2023-2024.

Results: Between January 2021 and December 2024, a gastrointestinal multiplex PCR panel was performed on 930 patients in our hospital due to gastroenteritis. A total of 323 tests were requested in the 2021-2022 period, while 607 tests were requested in the 2023-2024 period. The total number of detected pathogens was higher than the number of tests performed; this is because multiple pathogens were detected simultaneously in some patients. Looking at the pathogens detected in the first period, Enteropathogenic E. coli (EPEC): 125 (40.57%), Enteroaggregative E. coli (EAEC): 85 (27.56%), Enterotoxigenic E. coli (ETEC): 54 (17.53%), Campylobacter jejuni : 43 (13.95%), Shiga-like toxin-producing E. coli (STEC): 36 (11.68%), Clostridium difficile: 35 (11.36%), Enteroinvasive E. coli (EIEC): 15 (4.87%), Salmonella spp.: 13 (4.23%), Yersinia enterocolitica: 7 (2.27%), Rotavirus: 7 (2.27%), Astrovirus: 7 (2.27%), Giardia intestinalis: 6 (1.95%), Cryptosporidium parvum: 5 (1.62%), E. coli O157 H7: 5 (1.62%), Adenovirus: 5 (1.62%), Plesiomonas: 2 (0.65%), Sapovirus: 2 (0.65%), Vibrio parahaemolyticus: 1 (0.32%), Norovirus: 1 (0.32%) were detected. In the second period, the detected pathogens were EPEC: 204 (34.04%), EAEC: 153 (25.52%), Norovirus: 102 (17.00%), Clostridium difficile: 81 (13.52%), ETEC: 74 (12.35%), STEC: 65 (10.84%), Campylobacter jejuni: 57 (9.52%), Salmonella spp.: 29 (4.84%), Sapovirus: 17 (2.83%), Giardia intestinalis: 14 (2.34%), Rotavirus: 13 (2.17%), Astrovirus: 10 (1.67%), Cryptosporidium parvum: 9 (1.50%), E. coli O157 H7: 8 (1.33%), EIEC: 8 (1.33%), Yersinia enterocolitica: 7 (1.17%), Entamoeba histolytica : 3 (0.50%), Adenovirus 40: 3 (0.50%), Plesiomonas: 2 (0.33%), Vibrio parahaemolyticus: 1 (0.17%).

Conclusion: EAEC and EPEC were identified most frequently in both periods. A notable surge in Norovirus and Sapovirus cases was observed during the 2023-2024 period. A slight increase was observed in the prevalence of Giardia intestinalis. These findings indicate potential sanitation and infrastructure issues. Sapovirus, known in recent years for causing prolonged diarrhea in immunocompromised populations, also showed an increasing trend in our study. This increase can be attributed to the rising number of immunocompromised patients being treated at our facility. In conclusion, viral gastroenteritis is becoming an increasingly significant threat, and the potential for these agents to spread in the community is rising. Greater priority must be given to hygiene, vaccination, and education programs to prevent gastrointestinal infections.

Keywords: Gastroenteritis, Diarrhea, Viruses, Bacteria, Parasites, PCR



A Case Of Food-Related Contamination Obsessions İn Obsessive-Compulsive Disorder

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Abstract

Obsessive-Compulsive Disorder (OCD) is a psychiatric condition characterized by intrusive, anxiety-provoking thoughts (obsessions) and repetitive behaviors (compulsions) performed to reduce anxiety. Contamination obsessions are marked by persistent thoughts that contact with microbes or dirt may cause illness, harm others, or lead to contamination that cannot be cleaned. To reduce anxiety, individuals may perform excessive cleaning, use disinfectants, or even bleach. Sometimes contamination obsessions appear as doubts about whether food is clean. In such cases, people attempt to clean food in extreme ways, creating conditions where hygiene practices themselves threaten food safety. We present a case with obsessive cleaning tendencies since childhood, whose complaints worsened in recent years. The patient washed fruits, vegetables, and meat with bleach due to fears of contamination and illness. These behaviors impaired daily functioning, caused toxic chemical exposure, and posed food safety risks. The patient had previously been evaluated in other centers without consistent treatment and was admitted to our clinic for treatment regulation. This case illustrates a rare presentation of contamination obsessions. Repetitive behaviors such as washing food with bleach impaired functioning and led to medical complications. It also underlines an important point in food hygiene: when cleanliness becomes pathological, it may threaten food safety. The use of toxic substances like bleach in food washing increases the risk of chemical contamination and may have serious public health consequences. Recognition of such cases and timely psychiatric treatment, including pharmacotherapy and cognitive-behavioral therapy, is essential for reducing obsessive thoughts and maladaptive rituals while improving food safety outcomes.

Keywords: Food hygiene; Obsessive-Compulsive Disorder; Contamination fears; Chemical exposure; Public health



A Rare Case of Trichophagia with Granddaughter's Hair Ingestion

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Abstract

Trichophagia is a rare body-focused repetitive behavior characterized by taking hair into the mouth, chewing, and swallowing it. It is often associated with trichotillomania, observed in approximately 30% of patients, although only 1% develop trichobezoars requiring surgical intervention. The condition frequently remains unnoticed for long periods and is usually recognized only when gastrointestinal complications arise. Early signs include indigestion, abdominal pain, and constipation.

The presented case is remarkable for both clinical and psychosocial features. The patient's behavior began after significant stress related to her husband's infidelity and lack of support from her children, which culminated in her decision to remove her headscarf. The behavior mostly occurs when she is alone. Notably, she consumes not only her own hair but also strands belonging to her granddaughter, preferring those collected on the comb. This behavior may reflect the patient's conflicting emotions within family relationships. It suggests that both strong attachment and suppressed anger coexist, and trichophagia serves as a concrete expression of this ambivalence.

Recently, the patient developed constipation, was referred to gastroenterology, and colonoscopy was planned with the possibility of Rapunzel syndrome considered. At admission, fluoxetine 20 mg was initiated and increased to 60 mg during follow-up. Trichophagia should be considered not only a psychiatric problem but also a behavior that can lead to significant oral and gastrointestinal hygiene issues. Early recognition, psychoeducation, behavioral interventions, and medical monitoring are essential to prevent complications and ensure hygiene safety.

Keywords : Trichophagia; Trichotillomania; Rapunzel syndrome; Hygiene; Ambivalence



Evaluation of Occupational Accidents and Occupational Diseases Among Workers in the Food Sector in Türkiye

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Abstract

The food sector is an economically important field that provides extensive employment; however, due to physical, chemical, and biological hazards, it carries a high risk of occupational accidents and occupational diseases and therefore requires specific preventive measures.

In this descriptive study, occupational accidents and occupational diseases occurring in the food sector in Türkiye between 2020 and 2024 were examined using data from the Social Security Institution. The food sector was evaluated based on subsectors according to the NACE classification, and occupational accident frequency rates and incidence rates were calculated.

The findings indicate that the incidence rate of occupational accidents increased from 3.415 in 2020 to 5.636 in 2024, while the frequency rate rose from 10.9 to 15.0 during the same period. Occupational accidents occurred most frequently in the subsectors of “Manufacture of food products” (7.360), “Fishing and aquaculture” (6.087), and “Manufacture of beverages” (5.999). Although the number of occupational accidents was numerically higher among male workers, the proportion of female workers increased from 34% in 2020 to 44% in 2024. While the number of occupational diseases was relatively low, cases were observed in all years, reaching the highest level with 65 cases in 2021. The food sector accounts for approximately 11–12% of all occupational accidents, representing a significant burden nationwide.

In conclusion, the increase in occupational accidents and occupational diseases cannot be explained solely by the rise in the number of employees and indicates inadequacies in occupational health and safety measures. Higher rates were identified in the food sector in Türkiye compared to European Union countries, which may be associated with rapid growth in production, insufficient inspections, and informal employment. This study demonstrates the need to strengthen occupational health and safety in the food sector through sector-specific preventive policies, effective inspections, training programs, and increased investments in protective equipment. Our findings emphasize the importance of strategies aimed at protecting the health and safety of workers in the sector.

Keywords: Food Industry, Occupational Accidents, Occupational Diseases, Worker Health



Hoarding Disorder: Implications for Hygiene, Self-Care, and Public Health

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Abstract

Hoarding disorder is characterized by persistent difficulty discarding possessions, regardless of their actual value. Along with its psychiatric effects, it leads to serious hygiene and self-care problems, increasing the risk of infections, pest infestations, falls, and fire hazards. Thus, it threatens not only the individual but also public health. In this review, we examined the relationship between hoarding disorder, hygiene, and self-care, aiming to highlight its broader consequences for community health. Clinical and epidemiological studies were reviewed to evaluate the intersections of hoarding, self-care deficits, hygiene, and public health. Particular emphasis was placed on self-neglect among older adults and the importance of multidisciplinary interventions. Prevalence studies indicate that hoarding disorder affects 1.5–6% of the general population. In older adults, it has been found to be more strongly associated with self-neglect, poor personal hygiene, and increased medical comorbidities. The accumulation of possessions and waste creates conditions conducive to infections, pest infestations, and accidents. These effects pose risks not only for the individual but also for neighbors and the community. Therefore, coordinated efforts of psychiatry, social services, and public health institutions are required. Hoarding disorder should be recognized not only as a psychiatric condition but also as an important public health issue. Early diagnosis, psychoeducation, and community-based multidisciplinary interventions are critical in reducing hygiene-related risks and improving the well-being of both individuals and society.

Keywords: Hoarding disorder; hygiene; self-care; public health; multidisciplinary approach



Healing Flavors: An Evaluation of the Alaçatı Herb Festival from a Health Tourism Perspective

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Abstract

The aim of this study is to evaluate the potential contribution of plants exhibited within the scope of the Alaçatı Herb Festival to health tourism in the context of Traditional and Complementary Medicine (TCM). Conducted at the intersection of tourism and health sciences, the study adopted a qualitative research design, employing participant observation and semi-structured interviews during the data collection process.

The findings indicate that various herbs presented at the festival are associated with health within the framework of folk medicine and TCM approaches. It was found that rock samphire (Crithmum maritimum), selected as the theme herb of the 2025 festival, is traditionally used as a supportive treatment for goiter and thyroid-stimulating hormone (TSH) disorders. This highlights how traditional herbal knowledge is integrated with contemporary health practices through local festivals.

In conclusion, it has been determined that the health-related use of many naturally growing plants in Türkiye is widespread and that this knowledge is made visible through festivals. Promoting herbal products not only as gastronomic elements but also as components of health tourism at gastronomy-themed events such as the Alaçatı Herb Festival has the potential to increase health tourism demand for the region.

Keywords: Alaçatı Herb Festival, Traditional and Complementary Medicine, Rock Samphire, Health Practices



Integration of Good Agricultural Practices and Sustainable Gastronomy Tourism: A Public Health and Environmentally Friendly Production Approach

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Abstract

Good Agricultural Practices (GAP) constitute a holistic agricultural production approach adopted to ensure food safety, protect public health, and promote environmentally responsible production processes. This approach encompasses the appropriate and timely use of agricultural chemicals, the traceability of all stages from production to consumption, and the protection of occupational health and safety. GAP also promotes the sustainable use of natural resources by adhering to minimum hygiene and animal welfare standards and aims to minimize environmental impacts.

Within the context of sustainable gastronomy tourism, the importance of GAP has been steadily increasing. As a form of tourism that emphasizes local food and beverage experiences, gastronomy tourism directly relates to food safety, quality, and environmental sustainability. In addition to providing consumers with safe and healthy food, GAP supports local producers through environmentally friendly production methods. In this way, the gastronomy tourism experience becomes both secure and sustainable.

The aim of this study is to highlight the significance of GAP and organic farming practices in sustainable gastronomy tourism and to evaluate their contributions to the tourism experience. Conducted within the framework of a qualitative research design, the study analyzes data obtained from secondary sources using the document analysis method. The findings indicate that GAP practices enhance agricultural productivity and product quality, support environmentally friendly production, and strengthen the gastronomy tourism experience by ensuring the provision of safe food to consumers. Furthermore, the results reveal the strengths and weaknesses of existing practices and offer strategic recommendations for the development of sustainable agriculture and gastronomy tourism.

Keywords: Good Agricultural Practices, Food Hygiene, Public Health, Traceability, Sustainable Gastronomy Tourism.

Folk Medicine Practices in Balıkesir: From Tradition to the Present

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Abstract

Folk medicine in Balıkesir, as in many other regions of Türkiye, has persisted in various forms from the past to the present and has played a significant role in addressing health-related problems, particularly in rural areas. This body of knowledge, which has been transmitted from generation to generation through herbal treatments, animal- and mineral-based methods, belief- and ritual-oriented practices, and the healing practices of local healers known as ocak, occupies a strong place in the daily lives of the local population.

This study aims to examine traditional health practices in Balıkesir from historical, cultural, and social perspectives by compiling the findings of previous research on folk medicine practices in the region. The reviewed articles and theses were thematically classified, and region-specific practices were presented within a holistic framework. The findings indicate that folk medicine in Balıkesir functions not only as a means of treating illnesses but also as an important component in the preservation of cultural identity. These practices exhibit a multilayered structure encompassing both tangible treatment methods and symbolic-ritual elements. While they largely resemble folk medicine practices observed in other regions of Türkiye, certain distinctive practices stand out due to Balıkesir's geographical conditions and socio-cultural structure. Although their practical use has diminished in contemporary times, folk medicine practices continue to exist as elements of cultural heritage under the influence of modern medicine.

Keywords: Folk medicine, traditional healing, cultural heritage, Balıkesir

Gender Roles in Cleaning Product Advertisements within the Context of Semiotic Analysis

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Abstract

Gender is often evaluated primarily as a biological phenomenon. However, the influence of social dynamics on the formation of gender cannot be overlooked. At this point, the concept of gender emerges as a construct that goes beyond biological differences and is shaped by social norms. Gender assigns specific roles to women and men, defining their social identities and attributing distinct duties and responsibilities. In this way, gender roles determine individuals' positions within society, while gender perception plays a significant role in the construction of social status.

Following the formation of gender perceptions in society, it is observed that certain roles are adopted for women and men. While these roles classify the duties of women and men, they simultaneously reproduce prevailing gender perceptions. In this context, gender roles become particularly visible and reinforced through the media. Advertisements constitute one of the most influential platforms for this visibility.

The aim of this study is to reveal the representations of gender roles in cleaning product advertisements. Using the semiotic analysis method, the study examines how advertisements depict female and male roles, through which signs meanings are produced, and how these representations contribute to the reproduction of social norms.

Keywords: Semiotics, Cleaning Products, Gender Roles



Healing Flavors: An Evaluation of the Alaçatı Herb Festival from a Health Tourism Perspective

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Abstract

The aim of this study is to evaluate the potential contribution of plants exhibited within the scope of the Alaçatı Herb Festival to health tourism in the context of Traditional and Complementary Medicine (TCM). Conducted at the intersection of tourism and health sciences, the study adopted a qualitative research design, employing participant observation and semi-structured interviews during the data collection process.

The findings indicate that various herbs presented at the festival are associated with health within the framework of folk medicine and TCM approaches. It was found that rock samphire (Crithmum maritimum), selected as the theme herb of the 2025 festival, is traditionally used as a supportive treatment for goiter and thyroid-stimulating hormone (TSH) disorders. This highlights how traditional herbal knowledge is integrated with contemporary health practices through local festivals.

In conclusion, it has been determined that the health-related use of many naturally growing plants in Türkiye is widespread and that this knowledge is made visible through festivals. Promoting herbal products not only as gastronomic elements but also as components of health tourism at gastronomy-themed events such as the Alaçatı Herb Festival has the potential to increase health tourism demand for the region.

Keywords: Alaçatı Herb Festival, Traditional and Complementary Medicine, Rock Samphire, Health Practices



Hygiene Requirements in the Cooling and Reheating Stages of Foods in Mass Catering Operations

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Abstract

Today, changes in dietary habits, technological advancements in the food and beverage sector, and the increasing prevalence of out-of-home consumption have enhanced the importance of mass catering operations. These establishments undertake a significant responsibility in meeting individuals' basic nutritional needs. In addition to large-scale production, mass food service providers aim to offer safe and healthy meals to consumers. Every stage of the food production process, from raw material procurement to final consumption, is of critical importance for food safety.

In particular, the proper cooling of cooked foods under appropriate techniques and conditions, as well as their reheating when necessary, constitutes one of the most crucial stages in controlling physical, chemical, and microbiological risks. To ensure that foods are safely delivered to consumers, effective hygiene practices and strict control of temperature and time must be implemented during these stages. Businesses should adopt an approach in which critical limits are monitored and defined corrective and preventive actions are implemented when necessary. By ensuring appropriate conditions, foods can be delivered to consumers in a healthy manner, thereby preventing numerous foodborne risks.

Moreover, the implementation of all practices required by food safety and quality control systems to prevent hazards facilitates access to reliable food production standards for businesses. Establishments that apply internationally recognized standards, such as Hazard Analysis and Critical Control Points (HACCP), at critical control points not only fulfill legal requirements but also enhance consumer trust by providing safe and healthy food services. This study aims to present a modeling example to enable efficient and effective control within the framework of hygiene requirements during the cooling and reheating stages of foods.

Keywords: Mass Catering, Food Safety, Food Cooling, Reheating

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The Role of Cologne in Traditional Hygiene and Cleanliness Culture: The Example of Hikmet Cologne as a Local Brand

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Abstract

For centuries in Turkey, cologne has been not only a pleasant scent and a symbol of hospitality, but also an integral part of traditional hygiene and cleanliness culture. Thanks to its high alcohol content, cologne, which serves a disinfecting function, has been considered a symbolic indicator of hygiene and health awareness in society. This function has become particularly visible with the pandemic, and cologne has become a product directly associated with cleanliness and public health in daily life. Hikmet Kolonyaları, one of İzmit's well-established brands, stands out as a significant local brand that continues this cultural and functional role today.

This research was conducted within a qualitative research design to understand the role of cologne in traditional hygiene and cleanliness culture. Data obtained from semi-structured interviews conducted with the business owner, selected through purposive sampling, were evaluated using descriptive analysis. The findings focus on the importance Hikmet Kolonyaları places on hygiene and quality during the production process, the effects of increased disinfection use on the brand during the pandemic, and the local cultural identity of Kocaeli and its contributions to public health. As a result, it has been demonstrated that Hikmet Colognes is not only a commercial enterprise but also a brand that upholds traditional hygiene principles and strengthens regional identity.

Keywords: Cologne, traditional hygiene, cleanliness culture, local brand, İzmit, Kocaeli



Analysis of Postgraduate Theses in the Field of Cleaning, Hygiene and Sanitation

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Abstract

This study aimed to conduct a bibliometric analysis of theses on cleaning, hygiene, and sanitation within the database of the Council of Higher Education (YÖK) National Thesis Search Center, using a multidisciplinary perspective. For this purpose, a search was conducted using the keywords "cleaning, hygiene, and sanitation." The search yielded 161 theses on cleaning, 503 theses on hygiene, and 36 theses on sanitation. These theses were subjected to bibliometric analysis for various parameters, including university, institute, academic level, keywords, years, number of pages, research method, and thesis field.

The findings were analyzed using Microsoft Excel and Atlas Ti applications, and the results were interpreted. The findings indicate that theses concerning the concepts of cleaning, hygiene, and sanitation have been written not only in health and health-related fields but also in numerous fields, including tourism, agriculture, engineering, educational sciences, communication sciences, psychology, religion, history, political sciences, business administration, and home economics. The results demonstrate the multidisciplinary nature of the field.

The analysis revealed a significant increase in the number of theses over the years, particularly in the wake of COVID-19. It was also determined that theses were written across a wide range of disciplines, but were concentrated primarily in health sciences, such as public health, nutrition, and food engineering. In this context, this study provides a general assessment of theses on hygiene, cleaning, and sanitation at the Council of Higher Education's Thesis Search Center and offers a perspective for future research.

Keywords: Hygiene, Cleaning, Sanitation, Thesis, Bibliometric Analysis



Food Hygiene and Safety at Home: Proper Storage, Preparation and Cooking Practices

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Abstract

Home food hygiene is crucial for preventing foodborne illness and protecting public health. This study comprehensively covers the concepts of hygiene and food safety, biological, chemical, and physical hazards, cross-contamination risks, and the fundamental principles and practices for safely storing, preparing, cooking, and serving food in the home. Personal hygiene, regular cleaning of kitchen surfaces, proper cold chain management, separation of raw and cooked foods, and adequate heat treatment are fundamental to food safety. Maintaining appropriate internal temperatures and even heating during cooking are crucial for eliminating pathogenic microorganisms. Food poisoning cases in homes demonstrate the tangible consequences of neglecting hygiene rules. Simple oversights such as improper storage of raw foods, inadequate cooking temperatures, and cross-contamination pose serious risks, especially for children, the elderly, and individuals with weakened immune systems. Risk assessment and prevention measures, such as HACCP principles adapted to the home environment, contribute to reducing microbial risks. Next-generation technologies, such as UV-C and LED irradiation systems, antimicrobial surfaces, smart refrigerators, and digital tracking applications, complement traditional hygiene measures and reduce risks. Education and awareness programs help individuals adopt these practices sustainably in their daily lives. In conclusion, properly implementing food hygiene rules at home increases food safety, reduces foodborne risks, and protects public health. This study provides a comprehensive roadmap for ensuring safe food consumption at home.

Keywords: Home food hygiene; Food safety; Safe storage; Food preparation; Cooking practices; Modern hygiene Technologies



Smart Packaging Technologies For Enhanced Food Hygiene And Safety

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Abstract

Smart packaging is an innovative approach to enhance food safety, hygiene, and supply chain integrity. It includes intelligent and active packaging systems that that go beyond conventional containment and protection functions. Intelligent packaging utilizes real-time monitoring technologies, such as chemical and biological sensors, indicators, and data carriers, to provide dynamic information about microbial contamination, spoilage, package integrity, freshness, and environmental conditions during storage, distribution, and transportation of food products. This facilitates greater traceability and transparency throughout the food supply chain. Active packaging system includes compounds capable of absorbing/scavenging oxygen, carbon dioxide, ethylene, flavors, odors, or moisture, and/or compounds that are able to release or emit carbon dioxide, antioxidants, flavors, or antimicrobial agents. Traditional packaging often fails to address hygiene concerns, such as contamination risks during handling and transportation, lack of spoilage detection, and limited consumer awareness of product history. Smart packaging applications such as antimicrobial coatings, time temperature indicators, biosensors, and QR codes, contribute to food hygiene and safety by providing antimicrobial function and/or monitoring real-time safety data. Smart packaging has the potential to improve food hygiene and safety.

Keywords: Active packaging, Antimicrobial packaging, Food hygiene, Food safety, Intelligent packaging, Smart packaging



Application Of Artificial Intelligence In Food Hygiene Practices

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Ensuring food hygiene is vital for food safety and public health, since poor compliance with hygiene protocols is often linked to foodborne outbreaks. Traditional monitoring methods, such as manual inspections, audits, and microbiological swabs, are time-consuming, labour-intensive, and have limited capacity to capture real-time behaviours. Recent advances in Artificial Intelligence (AI), particularly computer vision and deep learning, provide new opportunities for monitoring and improving hygiene practices in food environments. Emerging applications of AI include the use of computer vision and deep learning algorithms to monitor hand hygiene compliance with Good Hygiene Practices (GHP), detect proper use of personal protective equipment (PPE), and prevent cross-contamination in production environments. Studies have demonstrated the high accuracy of convolutional neural networks (CNNs) and real-time detection models, such as YOLO architectures and ResNet variants, in recognizing complex hygiene-related behaviors. In parallel, the integration of AI with closed-circuit television (CCTV) systems offers unobtrusive, continuous, and bias-free observation of food handler practices, highlighting gaps often overlooked in conventional assessments. Beyond monitoring, AI technologies can also contribute to training, risk prediction, and proactive intervention strategies. However, challenges remain regarding data privacy, ethical considerations, and integration into existing food safety management systems. This review highlights the potential of AI as a transformative tool and multidisciplinary innovation in food hygiene practices.

Keywords: Artificial Intelligence; Computer Vision; Deep Learning; Food Hygiene; Food Safety; Hand Hygiene



Fermentation-Driven Production Of Industrial Enzymes From Fish Processing Waste: A Biotechnological Valorization Approach

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Biotechnology-centered integrated waste management systems are crucial for environmental hygiene and, indirectly, for protecting public health. The source separation of biowaste, the application of recycling technologies, and its valorization through biotechnological methods (e.g., composting or fermentation) not only mitigate environmental burdens but also generate value-added products while strategically supporting the circular economy. Food waste, known as the organic fraction of municipal solid waste, poses hygiene-related risks due to inadequate storage and disposal, which favor the proliferation of pathogens, vectors, and the release of harmful chemical compounds. Sustainable biotechnological processes enable the controlled conversion of such wastes into bioenergy (e.g., biomethane, bioethanol), biofertilizers, and other value-added bioproducts including enzymes, bioplastics, and animal feed through the action of microorganisms and biological catalysts.

The production of value-added products from food waste via fermentation is currently a research hotspot. Among these, industrial enzyme production is particularly significant. Considering that Türkiye's annual enzyme import cost is approximately 150 million USD, local biotechnological solutions gain strategic importance. In this study, an example fermentation process is presented in which fish processing waste was utilized as a substrate for microbial enzyme production.

Integrating biotechnological approaches into waste management requires not only scientific advances but also the strengthening of legal frameworks, the enhancement of local authorities' institutional capacities, and the promotion of public awareness. Establishing sustainable biotechnological integrated waste management systems is therefore indispensable for safeguarding both the environment and public health, ultimately ensuring a more livable future.

Keywords: Bio-waste; Biotechnological approches; Fermentation; Public Health; Hygiene



New Applications of Electrolyzed Water in the Food Industry

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Abstract

The electrolyzed oxidative water generator produced in Japan at the beginning of the 20th century was first utilized in the medical field. Studies on the use of electrolyzed water in the food industry began in the early 2000s. Electrolyzed water has been employed as an antimicrobial agent during the production and preparation of whole or cut meat and poultry, fish and seafood, fruits and vegetables, and shell eggs. Various methods, including spraying, washing, rinsing, immersion, cooling water, dip baths, and boiling water or ice, have been used for this purpose.

However, over time, the decreasing chlorine effectiveness in stored electrolyzed water reduces its antimicrobial efficacy. Additionally, there are other issues related to the use of electrolyzed water in the food industry. Some of these include the development of new production equipment for acidic electrolyzed water, increasing the efficacy of electrolyzed water to inactivate microorganisms in food, and particularly activating destructive mechanisms against biofilms on surfaces.

Therefore, current applications in the food industry focus on the development of effective technologies to enhance the stability, efficacy, and durability of electrolyzed water. These include innovative studies that combine electrolyzed water with various techniques such as ultrasound, photodynamic inactivation (PDI), ultraviolet light, and high pressure. This study reviews current research aimed at improving the effectiveness of electrolyzed water used in the food industry.

Keywords: Food; Food Industry; Electrolyzed Water; Antimicrobial.

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Cross-ContaminationRisks in Home Kitchens:

A StudyFocused on Cutting Board and KnifeUse

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Abstract

Cross-contamination in domestic settings is a major source of foodborne risk. This study aims to examine cross-contamination risks in home kitchens, with a specific focus on cutting board and knife practices, and to identify prevalent risky behaviors.

Employing a qualitative case study design, ten housewives residing in Kocaeli will be selected through purposive sampling. Data will be collected via a semi-structured interview form consisting of six questions and complemented by brief kitchen observations. The transcripts will be analyzed using content analysis.

Focusing on cutting board and knife use is expected to provide a concrete basis for designing low-cost, high-impact interventions (e.g., color-coded equipment, appropriate cleaning and disinfection, and proper storage) and to contribute directly to public health education and household food safety practices in the Kocaeli context.

Keywords: Foodsafety; Cross-contamination; Cutting board; Knife; Housewives



Microplastics and Cardiovascular Disease Risk: A Systematic Review of Human Evidence

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Abstract

Introduction: Microplastics (MPs), plastic particles <5 mm, are present in air, water, food, and medical products and have emerged as environmental and public health hazards. Animal and in vivo studies demonstrate MP accumulation in arterial walls, atherosclerotic plaque progression, and mechanisms such as inflammation, oxidative stress, endothelial dysfunction, and metabolic abnormalities, all contributing to cardiovascular diseases (CVDs). This systematic review aims to determine whether exposure to MPs is associated with CVDs and related risk factors in humans.

Methods: The review followed PRISMA 2020 guidelines. Eligible studies included adults (≥18 years) with measured MP exposure, compared to groups with lower or absent exposure. Outcomes included major cardiovascular events (myocardial infarction, stroke, cardiovascular death), hypertension, atherosclerosis, thrombosis, and intermediate outcomes (endothelial dysfunction, blood pressure, lipid profile, biomarkers of inflammation and oxidative stress). MEDLINE/PubMed, Web of Science, and Google Scholar were searched for the past five years. Reference lists and citation searches supplemented the strategy.

Results: Following the database searches, a total of 426 records were identified, with five human studies determined to meet the inclusion criteria. According to the findings, MPs within arterial plaques are linked to significantly elevated risk of cardiovascular events such as stroke and myocardial infarction. Evidence also suggests MPs promote thrombosis, inflammation, oxidative stress, and coagulation, potentially increasing vascular damage.

Conclusion: Limited human evidence suggests MPs may elevate cardiometabolic risk factors. It is essential to conduct prospective human studies with standardised measurement techniques for exposure, as well as research focused on strategies to mitigate plastic pollution.

Keywords: Microplastics, Cardiovascular Disease, Inflammation, Oxidative stress, Environmental Exposure.

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The Role Of Women In Hygiene And Invsible Labor In Coastal Fishing Communities

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Abstract

In coastal fishing communities, women are not only the main bearers of household responsibilities but also play a critical role in safeguarding community health. Hygiene practices that remain largely invisible – such as water provision, ensuring food safety, maintaining cleanliness in domestic and workspaces, and overseeing hygiene in child and elderly care – are shaped predominantly by women's labor. Yet, this contribution is often absent from statistics, policies, and academic research. This presentation aims to highlight women's invisible labor in hygiene management within fishing-dependent coastal communities. Drawing on literature review and field observations, it discusses the impacts of women's hygiene practices on community health, the prevention of infectious diseases, and the creation of sustainable living conditions. Furthermore, the invisibility of women's labor is examined through the lens of gender roles, emphasizing hygiene as a collective rather than merely individual determinant of well-being.

In conclusion, making women's contributions to hygiene visible in coastal fishing communities holds strategic significance for health policies, gender equality, and sustainable development goals.

Keywords: Hygiene; women's labor; coastal fishing communities; gender; public health



Evaluating the Relationship Between Nutrition Attitudes, Eating Disorders, and Body Awareness Among University Students

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Abstract

Aim: The aim of this study is to evaluate university students' attitudes toward nutrition and to examine the relationship between these attitudes and their tendency toward eating disorders and levels of body awareness.

Method: This is a cross-sectional study conducted among students at the Faculty of Health Sciences, Istanbul Arel University. The Healthy Eating Attitude Scale, the Orthorexia Nervosa Scale (TON-17), and the Body Awareness Questionnaire were used in the study.

Results: The mean age of the students was 22.3 ± 3.7. 79.1% of the students were female. 44.5% of the students were in their 4th year. 2.7% of the students were studying child development, 29.6% were studying nutrition and dietetics, 33.6% were studying physical therapy and rehabilitation, and 34.1% were studying nursing. There is a weak positive correlation between the total score on the Healthy Eating Attitude Scale and the TON-17 scale score ($r=0.220$, $p=0.001$) and a moderate positive correlation between the total score on the Healthy Eating Attitude Scale and the VFA scale score ($r=0.441$, $p<0.001$). There is a weak positive correlation between the Body Awareness Questionnaire Scale Score and the TON-17 Scale Score ($r=0.220$, $p=0.001$). In mulpitle regression analysis; in the first model, the Body Awareness Questionnaire Scale score ($\beta = 0.412$, $p < 0.001$) significantly predicted the attitude score toward healthy eating, the TON-17 Scale score ($\beta = 0.130$, $p = 0.037$) was also found to be a significant predictor. Model 1 explains 21% of the variance ($R^2 = 0.210$). The age variable was added to the second model, the gender variable to the third model, and the age, gender, and class variables were added together to the fourth model, but no significant contribution was found.

Conclusion: Body awareness was found to be the strongest predictor of attitudes toward healthy eating, while orthorexia nervosa tendency contributed to a lesser extent. Age, gender, and class were not found to cause a significant difference in eating attitudes.

Keywords: Body Awareness; Eating Attitudes; Orthorexia Nervosa; Healthy Eating



The Effects of Excessive Food Hygiene During Complementary Feeding on Gut Microbiota and Mental Health

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Abstract

Gut microbiota, which begins its colonization process at birth, matures throughout childhood and adolescence, playing a decisive role in both immunity and mental health. While bifidobacteria dominate in the early period, the introduction of complementary feeding leads to an increase in clostridial species, initiating the transition of gut microbiota toward an adult-like structure. This period is critical not only in terms of nutrition but also for the training of the immune system. Paying attention to food hygiene is essential to prevent infections; however, excessive sterilization practices may limit exposure to beneficial microorganisms, thereby negatively affecting microbiota diversity.

The gut–brain axis, a fundamental biological network enabling bidirectional communication between the gastrointestinal system and the central nervous system, regulates mood, stress response, and cognitive functions through microbial metabolites such as neurotransmitters, cytokines, and short-chain fatty acids. Particularly, the shaping of the hypothalamic–pituitary–adrenal axis during the postnatal period, in conjunction with microbial colonization, suggests that early-life microbiota changes may increase susceptibility to mental disorders later in life.

Recent findings indicate that excessive hygiene practices not only elevate the risk of allergic and autoimmune diseases but may also contribute to psychiatric disorders such as anxiety and depression. Therefore, balanced hygiene approaches that protect against infections while allowing the immune system to be exposed to natural stimuli are critical for both the physical and mental development of children during the complementary feeding period.

Keywords: Complementary Feeding; Food Hygiene; Infant Mental Health; Microbiota; Immune System

When Clean Becomes Extreme: A Case Report of Food Hygiene-Related OCD

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Abstract

Obsessive-compulsive disorder (OCD) is characterized by intrusive, recurrent thoughts (obsessions) that cause marked anxiety and by repetitive behaviors (compulsions) performed to reduce this anxiety. Contamination and hygiene-related obsessions are among the most common subtypes. When these obsessions involve food, they may lead to severe dietary restrictions, medical complications, and social isolation. We present the case of a 67-year-old woman with lifelong food hygiene-related obsessions dating back to childhood. She believed that food was "dirty," that each item had to be washed individually and, if necessary, soaked in vinegar, and that others could not prepare meals hygienically. Consequently, she avoided eating in restaurants or cafes, refrained from ordering food from outside, refused hospital meals, and arranged for food from her home during hospital stays. She was hospitalized in the endocrinology department for hyperglycemia and referred to psychiatry for hyperphagia assessment. Observations by the treatment team and other caregivers prompted a detailed history, revealing persistent obsessive thoughts and compulsive behaviors. Due to limited insight, she considered these behaviors normal and had never sought psychiatric care. Fluoxetine 20 mg/day was initiated, psychoeducation provided, and follow-up arranged. Literature shows that diagnosis in food hygiene-related OCD is often delayed, may be mistaken for other conditions, and can result in serious complications from dietary restriction. This case underscores that in patients with limited insight, thorough history-taking, attentive observation, and a multidisciplinary approach are essential for timely diagnosis and for preventing physical health deterioration, complications, and social isolation.

Keywords: Obsessive-Compulsive Disorder, Food Hygiene, Contamination Obsessions, Multidisciplinary Approach, Case Report

Food Hygiene and Sanitation: Current Challenges and Future Perspectives

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Abstract

Food hygiene and sanitation are fundamental components of food safety, directly influencing public health and preventing foodborne illnesses. Maintaining high standards of hygiene throughout the food supply chain—from production and processing to distribution and consumption—is essential for consumer safety and confidence. Despite widespread adoption of hygiene protocols and Hazard Analysis and Critical Control Point (HACCP) systems, foodborne outbreaks continue globally, highlighting ongoing challenges in sanitation practices. Common issues include improper food handling, cross-contamination, insufficient cleaning of equipment, and non-compliance with regulatory standards. The emergence of antimicrobial-resistant pathogens further increases the risk of microbial contamination.

Advances in sanitation technology provide new opportunities to address these challenges. Automated cleaning systems, advanced disinfectants, and digital monitoring tools enhance the effectiveness of hygiene practices and reduce human error. Additionally, regular training and education of food handlers improve compliance with hygiene standards and reinforce the role of personnel in food safety. Integrating technological solutions with comprehensive training programs ensures sustainable improvements in food hygiene and sanitation.

This work highlights current challenges in food hygiene, examines critical control points in the food supply chain, and explores practical strategies to enhance sanitation practices. Technological innovations, strict regulatory enforcement, and continuous training reduce contamination risks in food establishments and protect public health. These measures play a vital role in achieving safer, more reliable, and sustainable food systems.

Keywords: Food Hygiene, Sanitation, Food Safety, HACCP, Public Health

Digital Transformation in Food Production Management

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Abstract

In order for businesses to adapt to contemporary conditions, the effective use of technology across all operational processes is realized through digital transformation. Customer needs lie at the core of digital transformation. This process encompasses changes in leadership styles, new ways of thinking, innovation practices, and the implementation of new business models within organizations. Digital transformation aims to make enterprises faster and more efficient, enhance their competitive position, and increase customer satisfaction.

In addition to productivity gains, quality improvement, traceability, profitability, and sustainability are among the key benefits of digital transformation. Artificial intelligence (AI) is one of the most significant technologies enhancing efficiency and quality in food production. It enables transformation across multiple areas, ranging from production and supply chain management to customer experience and sustainability, thereby creating a competitive advantage in the food industry. Through automation, production processes are accelerated, while defective products can be instantly detected using image processing technologies. Sensors allow for the prediction of machine failures, reducing downtime. With QR codes, the origin and journey of products can be traced throughout the supply chain. AI also enables the development of personalized nutrition programs, and production processes can be optimized to achieve energy and water savings.

Digital transformation is an inevitable reality for maintaining competitiveness in the food sector. Openness to change, the adoption of innovative technologies, and continuous learning are essential for future readiness. As digital transformation in the food industry progresses rapidly, developing a digital transformation strategy, increasing investments in technology, preparing employees for digital change, and closely monitoring sectoral developments have become indispensable.

Keywords: Food, Production, Digital Transformation, Artificial Intelligence.



FULL TEXT



Smart packaging technologies for enhanced food hygiene and safety

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Abstract

Smart packaging is an innovative approach to enhance food safety, hygiene, and supply chain integrity. It includes intelligent and active packaging systems that go beyond conventional containment and protection functions. Intelligent packaging utilizes real-time monitoring technologies, such as chemical and biological sensors, indicators, and data carriers, to provide dynamic information about microbial contamination, spoilage, package integrity, freshness, and environmental conditions during storage, distribution, and transportation of food products. This facilitates greater traceability and transparency throughout the food supply chain. Active packaging system includes compounds capable of absorbing/scavenging oxygen, carbon dioxide, ethylene, flavors, odors, or moisture, and/or compounds that are able to release or emit carbon dioxide, antioxidants, flavors, or antimicrobial agents. Traditional packaging often fails to address hygiene concerns, such as contamination risks during handling and transportation, lack of spoilage detection, and limited consumer awareness of product history. Smart packaging applications such as antimicrobial coatings, time temperature indicators, biosensors, and QR codes, contribute to food hygiene and safety by providing antimicrobial function and/or monitoring real-time safety data. Smart packaging has the potential to improve food hygiene and safety.

Keywords: Active packaging, Antimicrobial packaging, Food hygiene, Food safety, Intelligent packaging, Smart packaging

INTRODUCTION

Traditional food packaging primarily serves passive functions, such as containing and protecting food, without actively contributing to its preservation. Moreover, several hygiene-related challenges remain inherent to traditional packaging systems. These include contamination risks during handling and transportation, the absence of real-time monitoring for spoilage or microbial growth, and restricted consumer access to information regarding product history and safety status.

Smart packaging offers innovative solutions based on food-package interactions to prolong shelf life, strengthen quality control, and improve food quality and safety, hygiene, and supply chain reliability (Biji et al., 2015). Smart packaging technology includes intelligent packaging and active packaging systems that go beyond conventional containment and protection functions of traditional packaging systems. Intelligent food packaging is designed to monitor conditions within the package and provide information about spoilage, contamination, and storage conditions. On the other hand,

active food packaging performs a direct functional role by extending shelf life or imparting desirable properties to the product. Accordingly, active packaging emphasizes functional enhancement of food quality, whereas intelligent packaging prioritizes communication and information transfer (Restuccia et al., 2015).

As intelligent packaging applications, time-temperature indicators, gas sensors, and microbial or pathogen detection tools are employed to monitor food quality and safety. Radiofrequency identification (RFID) devices, including labels, tags, and chips, facilitate food traceability, while holographic images, logos, and hidden design elements are applied to ensure product authenticity (Restuccia et al., 2015). In addition, active packaging applications, such as oxygen and ethylene scavengers, moisture absorbers, flavor and odor adsorbers and releasers, ethanol and carbon dioxide emitters, as well as antioxidant and antimicrobial releasers are employed to inhibit microbial growth, prevent oxidation, minimize losses in color and flavor, or to delay ripening, ultimately contributing to improved food quality and safety (Kuswandi and Jumina, 2020).

Intelligent Packaging

Intelligent packaging utilizes real-time "food freshness and quality" monitoring technologies, such as biosensors and chemical sensors, time-temperature indicators, freshness indicators, gas detectors, data carriers (barcodes, QR codes and RFID tags) to provide dynamic information about microbial contamination, oxidation, pH change, spoilage, package integrity, freshness, and environmental conditions during storage, distribution, and transportation of food products (Thirupathi Vasuki et al., 2023; Mkhari et al., 2025). This facilitates greater traceability and transparency throughout the food supply chain (Restuccia et al., 2015). Working principles of sensors and freshness indicators are based on the detection of biological and chemical compounds, such as enzymes, microbials, ethylene gas, or pH. The *Food Sentinel System*, is a barcode-based biosensor that has been developed by SIRA Technologies for the detection of foodborne pathogens. In this system, pathogen-specific antibodies are immobilized on a membrane that constitutes the barcode region. When contaminating bacteria are present, their interaction with the antibodies induces the formation of dark bars within the barcode, rendering it unreadable to conventional barcode scanners (Biji et al., 2015). On the other hand, time-temperature indicators function through diffusion or enzymatic, microbial, chemical, photochemical, and polymerization reactions. Examples of commercially available time–temperature indicators include *3M™ Monitor Mark*® (diffusion principle), *Fresh-Check* (polymerization reaction), *Keep-it* (chemical reaction), *OnVu™* (photochemical reaction), *Checkpoint* (enzymatic reaction), *Topcryo* (microbiological reaction), *and FreshCode*® (barcode-based system). Among them, *Checkpoint* system operates as a time-temperature indicator through an enzymatic reaction mechanism. It is composed of two distinct compartments: one containing substrate triglycerides and a pH indicator, and the other containing a solution of lipolytic enzymes. These compartments are separated by a seal that is disrupted upon exposure to elevated temperatures. Activation of the system initiates enzymatic hydrolysis of the triglyceride substrate, leading to acid formation and a consequent pH decrease. This shift in pH induces a visible color change, with the indicator transitioning from green to bright yellow (Biji et al., 2015).

In contrast to sensors and indicators, data carriers (barcodes, QR codes and RFID tags) neither measure nor analyze the quality of food products; instead they help prevent forgery throughout the food supply chain and support traceability, automation, identification, and anti-theft measures

(Rajan and Wani, 2025). The literature also reports efforts to combine different smart technologies. For instance, Lorite et al. (2017) developed a critical temperature indicator (CTI) integrated with RFID. The authors emphasized that integrating a CTI with a RFID tag offers a distinct advantage for real-time supply chain monitoring, achieved through the use of RFID readers positioned at strategic points (Lorite et al., 2017).

Active Packaging

Active packaging interacts with food or its environment to improve preservation. Active packaging system includes compounds, capable of absorbing/scavenging oxygen, carbon dioxide, ethylene, flavors, odors, or moisture, and/or that are able to release or emit carbon dioxide, antioxidants, flavors, or antimicrobial agents. For example, oxygen scavengers such as iron, ascorbic acid, metallic salts, and selected enzymes are employed to protect oxygen-sensitive food products, including biscuits, cakes, bread, snacks, cheese, cured meats, coffee, and beverages, against nutrient loss and quality deterioration caused by discoloration, rancidity, and mold spoilage. Ethylene scavengers such as activated carbon, clays, and zeolites are applied to slow down ripening, softening, and senescence in fruits, vegetables, and fresh cuts. Moreover, cellulose and its derivatives, zeolite, potassium chloride, sodium chloride, xylitol, sorbitol or silica gel are incorporated into food packages to reduce water activity and thereby protect products, including meats, poultry, fish, snacks, creals, dried foods, fruits, and vegetables from microbial spoilage (Kuswandi and Jumina, 2020). Within the scope of antimicrobial active packaging, a diverse range of antimicrobial agents may be incorporated into packaging materials through various strategies. These include impregnation into sachets that are subsequently attached to the package, adsorption or coating onto polymer surfaces, direct integration into packaging films, or the development of packaging matrices in which antimicrobial agents are embedded (Kuswandi and Jumina, 2020). Such approaches are designed to inhibit or control microbial growth and thereby enhance food safety and shelf-life. These antimicrobial agents include plant-derived compounds such as green tea, grape seed, rosemary, and aloe vera extracts, as well as essential oils of thyme, cinnamon, oregano, and clove; animal-derived proteins such as lysozyme and lactoferrin; microbial metabolites such as nisin and natamycin; organic acids (e.g., lactic, acetic, and propionic acids); and inorganic compounds (e.g., metals, metal oxides, zinc nanoparticles, and silver nanoparticles) (Han, 2005). These antimicrobial compounds exert their activity through multiple mechanisms, including disruption of cell membranes, interference with cell wall synthesis, inhibition of key enzymatic processes, and induction of oxidative stress (Kumar et al., 2025).

Commercially available iron-based oxygen scavengers include *Ageless Freshilizer*, *Oxyguard*, and *Freshmax*. Moisture-absorbing systems such as *Dri-Loc*® and *Tenderpac*® are designed to regulate humidity within the packages. Silver-based antimicrobial packaging technologies, *Biomaster*® and *Agion*®, function through controlled silver ion release to inhibit microbial growth. Meanwhile, commercial ethylene scavengers like *Peakfresh* and *Evert-Fresh* are employed to delay ripening and extend the shelf life of fresh produce (Biji et al., 2015).

The adoption of smart packaging technologies is largely depend on their cost-effectiveness, scalability, commercial viability, consumer satisfaction and perception (Rajan and Wani, 2025). Some of the challenges associated with smart packaging applications are: i) Since product spoilage can be caused by multiple interacting factors, a single indicator may fail to capture the

comprehensive quality status of the product, ii) External factors, such as light exposure, temperature fluctuations, and mechanical stress can compromise the accuracy of smart packaging systems and lead to false spoilage-positive assessments, iii) The smart system may miss signs of spoilage and lead to false spoilage-negative assessment, posing a potential risk to consumer health. Performance evaluations focusing on stability, reliability (sensor accuracy), and regulatory compliance are crucial for overcoming these challenges and ensuring the successful implementation of smart packaging applications (Mkhari et al., 2025).

CONCLUSION AND RECOMMENDATIONS

Recent advances in smart packaging technologies have highlighted their potential to enhance food safety and quality through various applications such as antimicrobial active packaging, time-temperature indicators (TTIs), biosensors, and QR code systems. In terms of public health, these smart technologies has the potential to reduce foodborne illnesses and other health risks by either inhibiting microbial growth or enabling continuous, real-time monitoring of critical safety parameters. It has been emphasized in recent studies that guaranteeing sensory accuracy, controling release kinetics, reducing production costs, and achieving scalability remain essential for broader commercial adoption. In the future, the integration of active and intelligent functions within a single package may offer a promising strategy to maximize their potential benefits. Furthermore, increasing the number of studies on smart films developed from biodegradable natural materials would help to address environmental concerns.

REFERENCES

Biji, K.B., Ravishankar, C.N., Mohan, C.O., and Srinivasa Gopal, T.K. (2015). Smart packaging systems for food applications: a review. *Journal of Food Science and Technology*, 52, 6125-6135.

Han., J.H. (2005). Antimicrobial packaging systems. In: *Innovations in Food Packaging* (J.H. Han (Ed.)): Academic Press Inc., pp: 80-201.

Kumar, L., Tyagi, P., Lucia, L. and Pal, L. (2025). Innovations in Edible Packaging Films, Coatings, and Antimicrobial Agents for Applications in Food Industry. *Comprehensive Reviews in Food Science and Food Safety*, 24: e70217.

Kuswandi, B.; Jumina (2020). Active and intelligent packaging, safety, and quality controls. In *Fresh-Cut Fruits and Vegetables: Technologies and Mechanisms for Safety Control* (M.W. Siddiqui (Ed.)); Elsevier Inc., pp. 243-294.

Lorite, G. S., Selkala, T., Sipola, T., Palenzuela, J., Jubete, E., Vinuales, A., et al. (2017). Novel, smart and RFID assisted critical temperature indicator for supply chain monitoring. *Journal of Food Engineering*, 193, 20-28.

Mkhari, T., Adeyemi, J.O., and Fawole, O.A. (2025). Recent Advances in the Fabrication of Intelligent Packaging for Food Preservation: A Review. *Processes*, 13(2), 539.

Rajan, S.S. and Wani, K.M. (2025). A review of smart food and packaging technologies: Revolutionizing nutrition and sustainability, *Food and Humanity*, 4, 100593.



Restuccia, D., Puocil, F., Parisi, O.I., and Picci, N. (2015). Food Applications of Active and Intelligent Packaging: Legal Issues and Safety Concerns. In *Functional Polymers in Food Science* (G. Cirillo, U. Gianfranco Spizzirri, and F. Iemma (Eds.)), Scrivener Publishing LLC, pp: 401-427.

Thirupathi Vasuki, M., Kadirvel, V., and Pejavara Narayana, G. (2023). Smart packaging—An overview of concepts and applications in various food industries. *Food Bioengineering*, 2, 25-41.



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