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IAFNS 2025 Annual Meeting

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Foodborne Illness

Updated Assessment of State Food Safety Laws for Norovirus Outbreak Prevention in the United States

Anita K. Kambhampati, E. Rickamer Hoover, Lisa A. Landsman, Beth C. Wittry, Laura G. Brown, Sara A. Mirza. *Jrnl of Food Prot.* 28 March 2025. doi.org/10.1016/j.jfp.2025.100501. [Article link](#)

Foodborne norovirus outbreaks are often associated with food contamination during preparation by an ill employee. The US Food and Drug Administration's Food Code outlines food safety provisions to prevent illness transmission in food establishments. An updated full version of the Food Code is released every four years; adoption of specific provisions is at the discretion of state governments. Food safety laws of the 50 states and District of Columbia (51 jurisdictions) were assessed for adoption as of March 2020, of four norovirus-related provisions included in the 2017 Food Code: 1) prohibition of barehand contact with ready-to-eat (RTE) food, 2) exclusion of food employees with vomiting or diarrhea, 3) person in charge being a certified food protection manager (CFPM), and 4) written response plan for vomiting or diarrheal events. We compared the frequency of adoption of the 2017 Food Code provisions to a previous assessment of adoption of these provisions in the 2013 Food Code. Prohibition of barehand contact with RTE food was adopted by 45 jurisdictions (88%), an increase from 39 jurisdictions (76%) in the previous analysis. Forty jurisdictions (78%) required exclusion of food employees with vomiting or diarrhea for ≥ 24 hours after symptom cessation, an increase from 30 jurisdictions (59%). Provisions requiring the person in charge to be a CFPM and written response plan for contamination events were new to the 2017 Food Code; 5 jurisdictions (10%) required the person in charge to be a CFPM and 9 (18%) required a written response plan. Adoption of provisions prohibiting barehand contact with RTE food and requiring exclusion of ill food employees increased. Newer provisions, requiring a person in charge as a CFPM and a written contamination response plan, were not as widely adopted. Increased adoption of Food Code provisions and improved compliance may decrease norovirus transmission in food establishments.

Foodborne Pathogens

Survivability of *Escherichia coli* O157:H7 ATCC 43888 and *Enterococcus faecium* ATCC 8459 in a Hydrocolloid Gel Bar Model and Macronutrient Bar Model in Response to Vacuum Microwave Drying and Storage

Dominique Pacitto-Reilly, Genevieve Flock. *Jrnl of Food Prot*, 26 March 2025. doi.org/10.1016/j.jfp.2025.100499. [Article link](#)

This study aimed to investigate the microbial safety of Vacuum Microwave Drying (VMD) and 30 days storage at 25°C on survivability of *Escherichia coli* O157:H7 ATCC 43888 and *Enterococcus faecium* ATCC 8459 in a nutritionally minimal bar model and macronutrient bar model. Sodium alginate hydrocolloid gel bars were inoculated with each microorganism and underwent processing in a 2 kW VMD and subsequent storage at 25°C for 10 days in sealed bags to determine the impact of VMD on bacteria without the influence of a nutritionally dense food matrix. Additionally, effects of macronutrient concentration on organism survivability during processing and storage were tested using a peanut butter banana bar formulated to contain high carbohydrate, high protein, or high fat content. The macronutrient bars were inoculated with each microorganism and underwent VMD with subsequent storage at 25°C for up to 30 days in sealed bags. Results of the hydrocolloid gel model showed that in a nutritionally minimal food matrix, both microorganisms were susceptible to VMD with additional loss of each microorganism during storage. Results showed entire loss of *E. coli* O157:H7 by day 10 of storage. In the macronutrient bar study, *E. faecium* had minimal susceptibility to VMD and storage at 30 days while *E. coli* O157:H7 had minimal susceptibility to VMD with greater susceptibility to storage for 30 days. There was a significant difference ($p < 0.05$) in log loss comparing *E. coli* O157:H7 VMD processed and unprocessed bars and minimal significance comparing *E. faecium* VMD processed and unprocessed bars. Water activity and moisture content at storage timepoints had no observed correlation with pathogen survivability in either study.

Heavy Metals

Migration of Toxic Elements from Recycled Paper Food Contact Materials to Food Simulants: Compatibility and Influence of Sample Preparation Methods

Athanasios Kourkopoulos, Dick Theodorus Hubertus Maria Sijm, Misha Vrolijk. *Food Quality and Safety*, Volume 9, 2025, fyaf002, 5 March 2025. doi.org/10.1093/fqsafe/fyaf002. [Article link](#)

The presence of toxic elements in paper and board food contact materials (FCMs) has been previously shown by various studies employing different sample preparation methods. This study elucidates the influence of migration methods on the migration of toxic elements from recycled paper FCMs to food simulants and compares these methods with exhaustive extraction approaches. Migration samples were prepared with four food simulants as specified in the Commission Regulation (EU) 10/2011: 3% (volume fraction) acetic acid, 10% (volume fraction) and 50% (volume fraction) ethanol, and Tenax. The extraction process underestimated the number and quantity of elements. Migration methodologies revealed distinct element transfer patterns influenced by the physicochemical properties of the food simulants. Toxic elements, including aluminum, cobalt, nickel, arsenic, lead, cadmium, barium, and uranium, were detected in quantities exceeding safety reference values. These findings underscore the need for harmonized migration testing and regulatory-specific migration limits.

Food Packaging

Evaluation of Different Transport and Distribution Conditions on Antimony Migration from PET Bottles to Mineral Water

Paulo Henrique Massaharu Kiyataka, Tiago Bassani Hellmeister Dantas, Aline Cristina Albino Brito, Luís Marangoni Júnior, Juliana Azevedo Lima Pallone. *Food Packaging & Shelf Life*, Vol. 48, March 2025. doi.org/10.1016/j.fpsl.2025.101450. [Article link](#)

This work investigated the effects of temperature, storage time and vibration related to mineral water transport, on the migration of antimony (Sb) present in polyethylene terephthalate (PET) bottles. Sb was quantified by inductively coupled plasma optical emission spectrometry (ICP-OES). Different conditions were used, such as, storage time: 3, 7, 10, 14 and 21 days, temperature: 40, 50 and 60 °C and vibration: sinusoidal, random and no vibration. The concentrations of Sb in mineral water after 21 days of storage were lower than the limit of quantification ($LOQ = 1.0 \mu\text{g l}^{-1}$) of the method at 40 °C for the

three types of vibration. At 50 °C, Sb concentrations were between 1.72 µg ℓ⁻¹ and 1.96 µg ℓ⁻¹. Sb migration was greater after 21 days of contact at 60 °C, with values greater than 4.00 µg ℓ⁻¹. The main factors that affected the increase in Sb migration were temperature and storage time. The effects of sinusoidal and random vibration during the transport simulation did not affect the increase in Sb migration.

Chemical Contaminants

US FDA Releases Searchable Chemical Contaminants Transparency Tool

US Food & Drug Administration, 20 March 2025. [Article link](#)

The FDA has published a variety of contaminant levels for poisonous or deleterious substances in human food in various guidance documents and regulations for industry. For ease of reference, the Chemical Contaminants Transparency Tool provides a consolidated list of these levels. Contaminant levels listed in the transparency tool include tolerances, action levels, guidance levels, derived intervention levels, recommended maximum levels, and advisory levels. Tolerances and action levels are defined in 21 Code of Federal Regulations (CFR) parts [109](#) and [509](#). Other types of contaminant levels are not defined in the regulation but have been used to advise industry on levels of contamination that may pose a health risk or may be avoidable through good manufacturing practices.

Caffeine

Consumption of Unsweetened Coffee or Tea May Reduce the Cancer Incidence and Mortality: A Prospective Cohort Study

Jingxue Xua, Yixue Wang, Siyu Wang, Hang Yin, Xiaoyuan Wang, Hongru Sun, et. al. *Journal of Nutrition*, 18 March 2025. DOI: 10.1016/j.tjn.2025.03.016. [Article link](#)

Background: Current evidence on the relationship between beverage intake and cancer risk remains inconclusive. **Objective:** This study aimed to examine the association between the intake of 11 beverages and cancer incidence and mortality, with a particular focus on coffee and tea, categorized by their sugar content. **Methods:** This large prospective cohort study included 189,020 participants from the UK Biobank. Multivariate Cox proportional hazard models were used to assess the association between beverage intake and the incidence and mortality of overall cancer and cancers of various systems. Additionally, the study investigated the effects of substituting one beverage for another and explored potential mediators underlying the relationship between beverage intake and cancer outcomes. **Results:** Over a median follow-up period of 8.8 years, consuming more than two cups of unsweetened coffee per day was associated with reduced overall cancer incidence and mortality. Compared to no intake of unsweetened coffee, the hazard ratios (HRs) were 0.95 (95% confidence interval [CI]: 0.92–0.98) for overall cancer incidence and 0.89 (95% CI: 0.83–0.96) for overall cancer mortality. Similarly, consuming more than two cups of unsweetened tea per day was associated with reduced overall cancer incidence (HR: 0.94, 95% CI: 0.92–0.97) and mortality (HR: 0.84, 95% CI: 0.79–0.91) compared to no unsweetened tea intake. Substituting unsweetened coffee or tea for other beverages was associated with a 1% to 5% reduction in overall cancer incidence and mortality. The association between unsweetened tea and reduced cancer risk may be partially mediated by inflammatory markers. Notably, the sugar content of coffee and tea had the most pronounced effect on the risk of respiratory system cancers. **Conclusions:** Beverage selection significantly impacts cancer incidence and mortality. For cancer prevention, unsweetened tea or coffee may be the optimal choice.

Food Allergens

Innovations in Peanut Allergy Diagnostics.

Allergies, Special Issue, Vol. 5 Issue 1, March 2025, 8 articles, various authors. [Article link](#)

Peanut allergy diagnosis is evolving, with advanced technologies that improve specificity and sensitivity while reducing patient risk. Traditional diagnostic methods such as skin prick tests and serum IgE testing have limitations, including false positives and variability. Emerging techniques, including component-resolved diagnostics, basophil activation tests, molecular allergy diagnostics, and artificial intelligence, offer a more precise, personalized approach. These innovations provide better risk stratification, guide treatment decisions, and may replace time-intensive oral food challenges. As peanut allergy prevalence rises, improved diagnostics will be crucial for patient safety and quality of life.

Risk Assessment

Occurrence and Nationwide Risk Assessment of Typical Food Processing Contaminants in Human Milk in China

Yimei Tian, Laizhao Wang, Anli Wang, Denghui Meng, Fan Zhang, Bing Lyu, Wei Jia, et. al. *Jrnl of Ag & Food Chem.*, 6 March 2025. Vol. 73, Issue 11. doi.org/10.1021/acs.jafc.4c11141. [Article link](#)

Typical environmental exposure and food processing contaminants, including acrylamide (AA) and monochloropropanediols (MCPDs), are widely present in the national Total Diet Survey. Nevertheless, the dietary exposure to and associated health risk of AA and MCPDs for breastfed infants remain unclear. Here, we assess the occurrence of AA, 3-monochloropropane-1,2-diol (3-MCPD), and 2-monochloropropane-1,2-diol (2-MCPD) in 3344 human milk samples collected from 24 provinces in China and further characterize their geographic distribution profiles and potential health risk to breastfed infants. At present, 100, 89, and 67% of the three typical contaminants are detected in human milk in this study, indicating widespread exposure risk at the nationwide level with higher exposure in urban areas. Risk assessment analyses demonstrate that 45.8 and 70.8% of provinces exhibit hazard quotients >1 for AA and 3-MCPD, respectively, signifying a potentially high health risk to breastfed infants in China. A worldwide comparison of occurrence and estimated daily intake in human milk and formula reveals that both AA and 3-MCPD show high levels in Chinese human milk. Our work demonstrates a potential risk of typical environmental and dietary sourced contaminants to breastfed infants and draws immediate attention to the health of the mother's diet during breast feeding.

Emerging Science Areas

Emerging Science Area: Digital Tools

Active Learning Models to Screen Articles as Part of a Systematic Review of Literature on Digital Tools in Food Safety

Tyler Wu, Sophia Ruser, Linda Kalunga, Renata Ivanek. *Jrnl Food Prot.* Vol. 88, Issue 5, 29 March 2025. doi.org/10.1016/j.jfp.2025.100488. [Article link](#)

Systematic reviews in food safety research are vital but hindered by the amount of required human labor. The objective of this study was to evaluate the effectiveness of semi-automated active learning models, as an alternative to manual screening, in screening articles by title and abstract for subsequent full-text review and inclusion in a systematic review of food safety literature. We used a dataset of 3,738 articles, which were previously manually screened in a systematic scoping review for studies about digital food safety tools, of which 214 articles were selected (labeled) via title-abstract screening for further full-text review. On this dataset, we compared three models: (i) Naive Bayes/Term Frequency–Inverse Document Frequency (TF-IDF), (ii) Logistic Regression/Doc2Vec, and (iii) Regression/TF-IDF under two scenarios: (1) screening an unlabeled dataset and (2) screening a labeled benchmark dataset. We show that screening with active learning models offers a significant improvement over manual (random) screening across all models. In the first scenario, given a stopping criterion of 5% of total records consecutively without having labeled an article relevant, the three models respectively achieve recalls of (mean \pm standard deviation) $99.2 \pm 0.8\%$, $97.9 \pm 2.7\%$, and $98.8 \pm 0.4\%$ while having viewed only $62.6 \pm 3.2\%$, $58.9 \pm 2.9\%$, and $57.6 \pm 3.2\%$ of total records. In general, there was a tradeoff between recall and the number of articles that needed to be screened. In the second scenario, we observe that all models perform similarly overall, including similar Work Saved Over Sampling values at the 90% and 95% recall criteria, but models using the TF-IDF feature extractor typically outperform the model using Doc2Vec at finding relevant articles early in screening. In particular, all models outperformed random screening at any recall level. This study demonstrates the promise of incorporating active learning models to facilitate literature synthesis in digital food safety.

Engage with IAFNS

Workshop on Science-Based Principles for Food Classification Focused on Processing and Formulation to Support Public Health

April 15, 2025
Washington DC and Virtual

The IAFNS Working Group on Food Classification has initiated a project focused on the development of Science-Based Principles for Classifying Foods Based on Processing and Formulation to Support Public Health. The goal of this effort is to deliver statements (Principles) which researchers can agree are representative of the evidence required to classify foods based on processing and formulation.

• We are pleased to offer an opportunity for an expanded audience to participate in the Workshop by supporting remote attendee/online attendee options.

- <https://iafns.org/event/workshop-on-science-based-principles-for-food-classification/>

Innovations in Cleaning and Sanitation for Low-Moisture Foods

April 29, 2025 – April 30, 2025
Arden Hill, MN

Join us for this joint conference on cleaning and sanitation for low-moisture foods sponsored by IAFNS, IFSH and the Univ. of Wisconsin-Madison Food Research Institute.

- <https://iafns.org/event/innovations-in-cleaning-and-sanitation-for-low-moisture-foods/>

A New Era in Reproducibility: The NIST Gut Microbiome Reference Material

April 29, 2025
Virtual Event

Challenges with reproducibility and comparability across studies are among the greatest encountered across research fields including in studying gut health.

- <https://iafns.org/event/a-new-era-in-reproducibility-the-nist-gut-microbiome-reference-material/>

IAFNS June 10-11, 2025, Annual Meeting – Register Today!

Washington, DC
June 10-11, 2025
National Press Club

- <https://iafns.org/event/iafns-2025-annual-summer-science-symposium/>



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