



Seismo Info 03/2024



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The FSVO compiles the most important food safety information every month:

[FSVO website](#)

★★★★ very important info ★★★ important info ★ interesting info

Microbiology

★★★★ **High genetic diversity and a recurring genomic lineage of *Campylobacter jejuni***: The aim of a new study was to assess **genomic diversity** and to identify antimicrobial resistance and virulence genes of 155 *Campylobacter* isolated from broiler carcasses in a large-scale Swiss poultry abattoir over a three-year period. A high degree of **genetic diversity** was observed. The identification of a **persisting highly clonal *C. jejuni* ST21** subtype suggests that the slaughterhouse may represent an environment in which *C. jejuni* ST21 may survive. [Infect. Genet. Evol.](#), 9 pages. (27.02.2024).

★★★★ **Microbiological and toxicological investigations on bivalve molluscs**: This study aimed to evaluate the hygienic qualities of **bivalves** sampled along the production and distribution chain in Sicily and collect useful data for consumer safety. *Vibrio spp.*, *Arcobacter spp.*, *Aeromonas hydrophila*, *Salmonella spp.*, and *Escherichia coli* were detected in 106/254, 79/254, 12/254, 16/254, and 95/254 molluscs, respectively. A total of 10/96 bivalves tested positive for **algal biotoxins**. [Foods](#), 10 pages. (11.02.2024).

★★★ **Cryogenic microorganisms in refrigerators**: Potential threat is posed by **cryogenic microorganisms** in household refrigerators. Diversity, virulence, antibiotic resistance of cryogenic microorganisms is important. Cryogenic microorganisms acquire multiple survival mechanisms at low temperatures. [Trends Food Sci](#), 10 pages. (18.02.2024).

★★ **First isolation and genotyping of pathogenic *Leptospira* spp. from Austria:** This study aimed to isolate circulating *Leptospira* strains from cattle in Austria to enhance the performances of the routine serological test for both humans and animals. Urine and/or kidney tissue were sampled from 410 cattle considered at higher risk of infection. Nine out of 429 samples tested positive by PCR, from which three isolates were successfully cultured and identified as *Leptospira borgpetersenii* serogroup Sejroe serovar Hardjobovis, cgMLST cluster 40. The detection of serovar Hardjobovis on a cattle farm is a notable finding, demonstrating that cattle in Austria may act as carriers of pathogenic *Leptospira*, acting as a **possible source of infection** of other animals and humans while contributing to environmental contamination through their urine. [Sci Rep](#), 10 pages. (26.02.2024).

★★ ***Clostridium perfringens* from aquatic sources:** In a study, *C. perfringens* from aquatic source showed a high isolation rate, notably cooked clams. *C. perfringens* toxin type G in clams was detected for the first time and the toxin genes *cpb*, *cpe*, and *netB* were detected for the first time in cooked clams. The average antibiotic resistance rates of the strains to tetracycline, clindamycin, and ampicillin were 45 %, 20 %, and 16 % respectively. [IntJFoodMicr](#), 2 pages. (28.02.2024).

★ **Enterococci in bovine raw milk and feces:** In this study, a high percentage of enterococci isolated from raw milk (71%) were identified as multidrug resistant. Results indicated that *Enterococcus* biotypes from milk and bovine feces belong to different community and the ability of these microorganisms to transfer anti-resistance genes is strain-dependent. [Food Microbiol.](#), 10 pages. (18.02.2024).

★ **Simulated aging of draught beer line tubing increases biofilm contamination:** A study was conducted to determine if repeated exposure to chemical cleaning of vinyl beer tubing impacted biofilm growth, kill/removal, and subsequent regrowth of a mixed species biofilm. The tubing was conditioned to simulate one, two, and five years of use. The data collected demonstrates a clear trend between simulated age of the tubing and biofilm accumulation on the surface. The biofilm that accumulated in the five-year aged tubing was able to recover more quickly after caustic cleaning, reaching 3.6 Log(CFU/cm²) within 24 h, indicating that the treatment did not fully eradicate the biofilm, suggesting that the strong chemistry used in this study would cease to be as effective over time. [IntJFoodMicr](#), 1 page. (17.02.2024).

★ **Vertical Transmission of *Salmonella*:** An untraditional serotype of *Salmonella*, *S. enterica* serotype Reading (*S. Reading*), recently emerged as a foodborne pathogen following a multi-state outbreak in the U.S. due to the consumption of contaminated turkey products. Findings of a study clearly show the ability of the *S. Reading* to colonize reproductive tissues of breeder hens as well as vertically transfer to eggs. [Feedstuffs](#), 1 page. (20.02.2024). Original Publication: [Mississippi State University](#).

★ **Molecular epidemiology of emerging zoonotic pathogen *Streptococcus suis* in Europe:** *Streptococcus suis*, a zoonotic bacterial pathogen circulated through swine, can cause severe infections in humans. Because human *S. suis* infections are not notifiable in most countries, incidence is underestimated. A recent study surveyed 7 reference laboratories and performed a systematic review of the scientific literature. 236 cases of human *S. suis* infection from those sources were identified and an additional 87 by scanning gray literature. Clonal complex (CC) 1 isolates accounted for 87% of typed human infections. [Emerg Infect Dis](#), 3 pages. (03.2024).

★ ***Staphylococcus succinus* infective endocarditis:** Infective endocarditis is a rare condition in humans and is associated with high illness and death rates. A recent study describes a case of infective endocarditis caused by *Staphylococcus succinus* bacteria in France. Studies have reported the frequent isolation of *S. succinus* bacteria from various sources, such as cheeses, dry or fermented meat products, the Dead Sea, and occasionally human specimens. This study reports a case of *S. succinus* infective endocarditis in a patient in France. [Emerg Infect Dis](#), 2 pages. (03.2024).

★ **Safety of cold brew: Cold brew coffee** is made by steeping coffee grounds in cool or cold water for several hours. Due to the low acidity and lack of boiling water, research shows that it's also the ideal environment for foodborne pathogens such as *Bacillus cereus*, *Listeria monocytogenes*, *E. coli* and *Salmonella*. Results show that all pathogens survive in coffee from 9 to 12 days, and that contamination occurs during the brewing process, through contaminated ingredients or an unhygienic brewing environment. [The Augusta Chronicle](#), 2 pages. (12.02.2024). Original Publication: [CEAS - UGA](#).

★ **Hot-drinks vending machines in Southern Italy:** Vending machines (VMs) are common and convenient sources of various food and beverage items. Due to limited available information, concerns have been raised about the hygiene and safety of products dispensed by VMs. A new study aims to assess the microbiological contamination of VMs in the Campania region (Italy). *Listeria monocytogenes* and *Salmonella* spp. were not detected in any of the samples subjected to analysis. *Bacillus cereus* and *Staphylococcus aureus* were detected in various VMs components. [FoodContr](#), 7 pages. (13.02.2024). Additional Information: [KLBS](#).

Chemistry

★★★ **Cooking-derived possible carcinogens in grilled plant-based patties:** This study for the first time suggests that the **cooking-derived possible carcinogens**, Heterocyclic Aromatic Amines (HAAs) and Polycyclic Aromatic Hydrocarbons (PAHs), can also be found in **grilled plant-based meat patties**. The levels of HAAs in all plant-based (soy, rice, corn)- patties are lower than those of beef patties. In contrast, the levels of PAHs in plant-based patties are generally higher than those of beef patties. Among plant-based patties, soy-based one contains the highest level of HAAs and rice-based one contains the highest level of PAHs. [FoodContr](#), 10 pages. (19.02.2024).

★★ **Food additive E551 could promote coeliac disease:** A study has found that food additive **E551**, also known as **silicon dioxide**, can reduce oral tolerance to **dietary proteins** and could foster the development of **coeliac disease**. This work is the first to highlight the potential toxicity of E551, a nanometric ingredient that is added to a wide range of consumer food products. [EurekAlert](#), 3 pages. (21.02.2024). Original Publication: [ehp](#).

★★ **Mycotoxins in seed hemp varieties:** A small survey on mycotoxin contamination was carried, out from 2018 to 2022, in **hemp seed samples** cultivated in Italy **for food use**. The results showed a limited occurrence of the most common regulated **mycotoxins** (aflatoxins, fumonisins, ochratoxin A, deoxynivalenol and zearalenone), but very high levels of **alternariols**, reaching a maximum value of 24.4, 308, 226 and 288 µg/kg for tenuazonic acid, tentoxin, alternariol and alternariol monoether, respectively. [Food Addit Contam Part A](#), 1 page. (26.02.2024).

★ **Global occurrence of emerging mycotoxins in crops and animal feeds:** A new study investigates the **scale of emerging mycotoxins contamination** of crops and animal feeds globally, and evaluates their impacts on the health and performance of livestock, especially when they co-occur alongside regulated mycotoxins. **Emerging mycotoxins** including nivalenol, enniatins, beauvericin, diacetoxyscirpenol, fusaric acid, patulin, moniliformin and sterigmatocystin were found to be the most prevalent contaminants of cereals and other feed commodities worldwide. [Emerg. Contam.](#), 8 pages. (03.09.2024).

★ **Microcystins in fish:** A rapid risk assessment discusses the detection of **microcystins** in various parts of **fish**, with the highest concentrations found in the intestine and liver samples. The study, conducted by the University of California, San Diego, also highlights the potential health risks associated with microcystin exposure, particularly its impact on the liver. Overall, the authors consider the **severity of illness** that could potentially occur as a result of exposure to microcystins from consuming edible fish flesh from Lough Neagh to be **medium**. [FSA](#), 17 pages. (07.03.2024).

★ **Microplastics contamination affects cell-based food during production:** A recent study has demonstrated the food safety concern of **microplastics** contamination in **cell-based seafood**. It focused on Atlantic mackerel (*Scomber scombrus*) skeletal muscle cell lines to examine the effects of microplastic exposure, represented by fluorescent polyethylene microspheres (10–45 µm) on cell performance including cell proliferation, cell viability, gene expression, and differentiation processes critical for cultivated meat production. The results revealed significant impacts on cell attachment and proliferation at microplastic concentrations of 1 µg/mL, 10 µg/mL, and 50 µg/ml. [FoodSafetyMag](#), 3 pages. (01.03.2024). Original Publication: [Front. Food. Sci. Technol.](#)

★ **Polycyclic aromatic hydrocarbons in sewage-irrigated vegetables:** A new study investigates the presence of **polycyclic aromatic hydrocarbons** (PAHs) in sewage-irrigated **vegetables** from industrial cities in Haryana, India. It found high concentrations of PAHs in spinach, carrot, and cucumber, indicating potential **health risks** for consumers. [Environ Monit Assess](#), 10 pages. (02.03.2024).

Nutrition

★ ★ **Plant-based dairy and fish alternatives: iodine nutrition in the Swiss diet:** A new study assessed the **iodine content** in plant-based dairy and fish alternatives available in the Swiss market. Only four out of 477 plant-based alternative products are iodine fortified in the Swiss market. Thus, the risk for consumers to miss out on the ca. 25% of the RDA for iodine by consuming plant-based alternatives is high, placing them at a risk for inadequate iodine intake. [Eur. J. Nutr.](#), 12 pages. (07.03.2024).

★ ★ **Food additive emulsifiers and cancer risk:** A team of French researchers analyzed data from the French NutriNet-Santé cohort study, which involved 92,000 adults with an average age of 45 years (79% women), over an average follow-up period of 7 years. They observed that a higher consumption of **mono- and diglycerides of fatty acids** (E471) was associated with an overall 15% increased risk of cancer. Moreover, the risks were even more pronounced in specific cancer types, with breast cancer risk rising by 24% and prostate cancer risk by 46%. Additionally, the study revealed that a higher intake of **carrageenan** (E407 and E407a) was linked to a 32% increased risk of breast cancer compared to those with lower consumption levels. [Affidia](#), 2 pages. (16.02.2024). Original Publication: [Plos Med](#).

★ **Excess protein and atherosclerosis:** The study, which combined small human trials with experiments in mice and cells in a Petri dish, showed that consuming over **22% of dietary calories** from protein can lead to increased activation of immune cells that play a role in **atherosclerotic** plaque formation, driving the disease risk. [EurekAlert](#), 2 pages. (19.02.2024). Original Publication: [NatureMetabolism](#).

★ **Too much vitamin B3 contribute to heart disease:** Now, researchers have added to the list of potentially **modifiable risk factors** with a new study reporting high levels of a common **B vitamin called niacin** in the body may contribute to **cardiovascular disease**. This study identifies excess niacin, specifically its breakdown metabolite 4PY, as a risk factor for major adverse cardiovascular events such as heart attack and stroke [MedNewsToday](#), 3 pages. (21.02.2024). Original Publication: [Nat. Med.](#).

★ **Sugary drinks erase the heart health benefits of physical activity:** Researchers examined data from 100,000 adults over a 30-year period. Results showed people who drank sugar-sweetened beverages more than twice a week had an increased risk of **cardiovascular disease despite their level of physical activity**. Even if they engaged in 150 minutes of weekly physical activity, it didn't outweigh the harmful impact of sugar-sweetened beverage consumption. [MedNewsToday](#), 4 pages. (07.03.2024). Original Publication: [AJCN](#).

Allergy

★ ★ **Vegan labelling: use and understanding by consumers with food hypersensitivities:** In December 2023, the Food Standards Agency conducted an online omnibus **survey** with individuals who have, or buy for, those with food hypersensitivities (FHS) to allergens of animal origin. Many respondents did not know that **vegan** products might not be suitable for those with FHS to allergens of animal origin and that they need to check for precautionary **allergen labelling** on vegan products. [FSA](#), 32 pages. (03.2024).

Fraud / Deception

★ ★ **Multi-million Dollar fraud targeting U.S. organic food market:** A Turkish businessman and his associates orchestrated an elaborate scheme to sell fraudulent **organic grain** in the US market through a web of companies, leading to their indictment in a federal criminal complaint and a civil lawsuit in US courts. [MEF](#), 3 pages. (04.03.2024). Original Publication: [Nordic Monitor](#).

★ **Pink cotton candy:** Pink cotton candy, a sugary delight cherished by children worldwide, has sparked health concerns in India. The southern state of Tamil Nadu implemented the ban after lab tests confirmed the presence of a cancer-causing substance, **Rhodamine-B** as well as and an unidentified violet colour, in samples sent for testing. [BBC](#), 1 page. (22.02.2024).

Close up

New information concerning the [FSVO's early detection system](#) for food safety:

- DOI [10.5281/zenodo.10787274](#) obtained for the report : **“Is food safety in Switzerland impacted by the war in Ukraine?”** (Executive summary in English, German, French and Italian. Report in German)
 - DOI [10.5281/zenodo.10630256](#) obtained for the report : **“Impact of mercury released from permafrost on food safety in Switzerland”** (Executive summary in English, German and French. Report in English)
 - Signal Report **“Citrus Greening disease”** (in French) (21.03.2024)
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Seismo Info 02/2024



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★★★★ very important info ★★★ important info ★ interesting info

Microbiology

★★★★ **A small increase in temperature could reduce CO2 emissions:** The international standard for freezing food is **-18°C**, a temperature that carries huge emissions costs. What if, asks a report published for COP28 by a large team of international cold chain experts, we raised this to **-15°C**? In fact, they find that raising the global target by just three degrees could avoid emissions equivalent to those produced by 4 million cars every year. It has been explained that this higher temperature poses no risk to food. However, the challenge of **parasite inactivation** linked to rising temperatures was not addressed in the report. [Anth](#), 2 pages. (12.01.2024). Original Publication: [IIR](#). Additional Information: [Unilever](#).

★★★★ **Zoonotic potential of foodborne isolates of *Klebsiella pneumoniae*:** Results of a study suggest that a similar risk of **zoonosis transmission** from potentially virulent **foodborne strains** previously observed in *E. coli* is also present in *K. pneumoniae*. According to the study, foodborne isolates of *K. pneumoniae* pose a risk to consumers and therefore this pathogen should be included in the surveillance of foodborne pathogens with high risk of **multi-drug-resistant infections** and therapeutic failure. [IntJFoodMicr](#), 35 pages. (23.01.2024).

★★ **The impact of weather on *campylobacteriosis*:** Researchers investigated the impact of **weather** on the **transmission of *campylobacteriosis***. Analysis of data from around one million cases of *campylobacteriosis* in England and Wales showed that the incidence rose sharply for every five degrees Celsius rise in **temperature**, when temperatures were between eight and 15 degrees Celsius. A link to **humidity** was also identified, especially when levels of water vapour in the air were between 75- 80 percent. Interestingly, researchers observed strong associations between **day length** (longer than 10 hours) and increased cases of the illness. [EurekAlert](#), 2 pages. (18.01.2023). Original Publication: [PLoS Comput. Biol.](#)

★★ ***Vibrio metschnikovii* as an emergent pathogen:** This study provides an enhanced understanding of the genomic evolution, O-antigen biosynthesis gene clusters diversity, and **potential pathogenic features** of *Vibrio metschnikovii*. The whole-genome features of 103 *Vibrio metschnikovii* strains isolated from different sources are described. Nineteen virulence-associated factors involving 161 genes were identified. *V. metschnikovii* was also found to promote a high level of cytotoxicity. [FoodWorld](#), 1 page. (20.01.2024). Original Publication: [Emerg Microbes Infect.](#)

★★ **Impacts of surface defects on the efficacy of sanitizers against *Listeria monocytogenes* biofilms:** A study has demonstrated the extent to which **defects on food contact surfaces** in tree fruit packinghouses lowers the efficacy of sanitizers against *Listeria monocytogenes* biofilms. Results showed that surface defects significantly increased the population of *L. monocytogenes* in biofilms on non-stainless-steel surfaces, and compromised the efficacies of **sanitizers** against *L. monocytogenes* biofilms across various surface types. [FoodSafetyMag](#), 3 pages. (01.02.2024). Original Publication: [JFoodProt](#).

★ **Persistence of microbiological hazards in food and feed production and processing environments: *Listeria monocytogenes*, *Salmonella enterica* and *Cronobacter sakazakii*** were identified as the bacterial food safety hazards most relevant to public health that are associated with persistence in the **food and feed processing environment** (FFPE). In this report, knowledge gaps related to bacterial food safety hazards associated with persistence in FFPE and priorities for future research are provided. [FoodWorld](#), 1 page. (19.01.2024). Original Publication: [EFSA](#)

★ **Global emergence of a hypervirulent carbapenem-resistant *Escherichia coli*:** A new study reports the emergence of a **hypervirulent carbapenem-resistant *Escherichia coli*** (CREC) ST410 clone, B5/H24RxC, which has become the most commonly isolated sequence type in Chinese hospitals between 2017 and 2021. Genomic analysis reveals that this clone caused two separate outbreaks in a children's hospital and has been isolated in **ten other countries** from 2015 to 2021. [NatureComm](#), 15 pages. (12.01.2024).

★ ***Escherichia coli* O157:H7 contamination in indoor farming:** Bacterial contamination of produce is a concern in **indoor farming** due to close plant spacing, recycling irrigation, warm temperatures, and high relative humidity during production. **Lettuce** (*Lactuca sativa*) cultivars with varying plant architectures grown in a custom-built indoor farm exhibited differences in *E. coli* O157:H7 survival after inoculation. Contamination of **E. coli O157:H7** on lettuce plants can be reduced and the food safety levels in indoor farms can be increased by selecting cultivars with an open leaf architecture coupled with photo-sanitization using low and frequent exposure to UV A + C radiation. [J Sci Food Agric.](#), 10 pages. (31.01.2024).

★ **Transfer of pathogens from contaminated soilless substrate and seeds to microgreens:** Microgreens can be contaminated from several pre-harvest sources, including soilless substrate, plant nutrient solution, water and seeds. The aim of a recent study was to determine the **transfer of *Salmonella*, Shiga toxin-producing *Escherichia coli* O157:H7 and *Listeria monocytogenes*** to the edible part of different types of **microgreens** from plant nutrient solution-soaked perlite as soilless substrate or seeds. This study suggests that there is a **high risk of transfer** of the pathogen population to microgreens in the case of seed or soilless substrate contamination if the growth or survival of the pathogen is supported in the plant nutrient solution. [IntJFoodMicr](#), 10 pages. (01.02.2024).

★ **Colonization of radish by human pathogenic microorganisms:** Vegetables are known to be potential vehicles for **human pathogenic microorganisms** (HPMOs) and sources of disease outbreaks. In a recent study the susceptibility of **radish** (*Raphanus sativus*) to be colonization by different HPMOs, including *Escherichia coli* PCM 2561, *Salmonella enterica subsp. enterica* PCM 2565, *Listeria monocytogenes* PCM 2191 and *Bacillus cereus* PCM 1948 was tested. The results suggest that *E. coli* and *L. monocytogenes* show a higher ability to colonize and move across the plant than *B. cereus* and *S. enterica*. [FrontMicr](#), 10 pages. (15.01.2024).

★ **Emergence of *tet*(X4)-positive *Enterobacterales* in retail eggs:** The proliferation of **antimicrobial-resistant** microbes and resistance genes in various foods poses a serious hazard to public health. The plasmid-mediated tigeicycline resistance gene *tet*(X4) has been detected in ***Enterobacterales*** from various niches but has not yet been reported in **eggs**. A recent study from **China** aimed to investigate the occurrence and characteristics of tigeicycline-resistant strains from retail eggs. The contamination of *tet*(X4)-positive bacteria internally and externally in retail eggs poses a prospective food safety threat. [IntJFoodMicr](#), 10 pages. (25.01.2024).

★ ***V. cholerae* and *A. salmonicida* two zoonotic “pathogens”?**: *Aeromonas salmonicida* is pathogenic for fish, mainly for salmonids, and its opportunistic pathogen status is discussed. Human infections caused by *Aeromonas salmonicida* have been reported. Recently mesophilic strains of *A. salmonicida* have been described and involved in humane infection. *Vibrio cholerae* non-O1/non-O139 is an opportunistic human pathogen. Reports of animal infections, not only in aquatic animals, raise the question of its zoonotic potential. [BfR](#), 1 page. (17.11.2023). Original Publication: [anses](#).

★ **Common food preservative has unexpected effects on the gut microbiome**: A study from the University of Chicago found that one of the most common classes of **lantibiotics** has potent effects both against pathogens and against the commensal gut bacteria that keep us healthy. **Nisin** is a popular lantibiotic used in everything from beer and sausage to cheese and dipping sauces. The researchers found that while the different nisin-like lantibiotics had varying effects, they killed pathogens and commensal bacteria alike. [UChicago](#), 3 pages. (02.02.2024). Original Publication: [ACS Chem. Biol.](#)

Chemistry

★★★ **Analysis of emerging food safety and fraud risks of novel insect proteins**: Research and development has been directed towards alternative proteins, with **edible insects** being promising sources. The main potential points of food safety and fraud along the edible insect supply chain were identified in a new study. Feed substrate was identified as the main area of concern regarding **microbiological** and **chemical** food safety and **novel processing techniques** were forecast to be of most concern for **future fraudulent activity**. [npj Sci Food](#), 12 pages. (20.01.2024).

★★ **Pesticide residues, elemental composition and mycotoxin levels in ciders**: Knowledge about the toxicological profile of ciders is rather scarce. In a Spanish study, 68 ciders were analyzed for pesticides, mycotoxins, POPs and elemental composition. The concentrations of pesticides, POPs and mycotoxins can be considered as safe. However, certain elements, notably **bromine** (br) and **lead** (Pb) in traditional ciders, raised potential concerns. [FoodContr](#), 10 pages. (23.01.2024).

★ **Trade in pesticides**: The European Union has declared certain **pesticides** to be hazardous to human health and to the environment, and outlawed or severely limited their use within Europe. However, the very same outlawed or restricted compounds are finding their way into the global south, exported by EU agrochemical companies. In 2018 alone, more than 81,000 tonnes of pesticides containing **41 different hazardous chemicals** banned for agricultural use in the EU were exported by European corporations. [Elephant](#), 6 pages. (17.01.2024).

★ **Mycotoxins in plant-based meat alternatives**: In a recent study, the role of **microwave cooking** in reducing mycotoxin contamination in **plant-based** food matrices was investigated, with a focus on veggie burgers (purchased and home-made) and their ingredients (soybean, potatoes, zucchini, carrots). The degradation patterns of **aflatoxins** (AFB1, AFB2, AFG1, AFG2), **fumonisin** (FB1, FB2, FB3), **trichothecenes** (T2, HT2, ZEA), and **ochratoxin A** (OTA) were studied. Principal component analysis (PCA) showed that degradation under microwave cooking varies considerably across different food matrices and cooking conditions. [Foods](#), 17 pages. (21.01.2024).

★ **Heavy metals exposure may lead to earlier menopause**: Middle-aged women with elevated levels of heavy metals, such as **arsenic, cadmium, and mercury**, are more likely to have depleted ovarian function and egg reserves, which may lead to **earlier arrival of menopause** and its negative health effects. Arsenic, cadmium, mercury and lead are commonly found in drinking water, air pollution and some foods, notably seafood and rice. [UniMichigan](#), 2 pages. (26.01.2024). Original Publication: [JCEM](#).

★ **Weight loss shakes**: A recent test of 17 **weight loss shakes** revealed that 11 of them failed due to contamination with mineral oil residues and controversial sweeteners. Only two shakes were rated as "good" and recommended. The shakes are intended to replace one or two main meals daily and are composed of milk and/or soy protein, vitamins, minerals, sweeteners, and other additives. [Öko](#), 2 pages. (25.01.2024).

Nutrition

★★ **Switching diet rapidly impacts immune system:** Researchers observed rapid and distinct immune system changes in a small study of people who switched to a **vegan** or a **ketogenic** diet. They found that the vegan diet prompted responses linked to innate immunity while the keto diet prompted responses associated with adaptive immunity. Metabolic changes and shifts in the participants' microbiomes were also observed. More research is needed to determine if these changes are beneficial or detrimental. [ScienceDaily](#), 2 pages. (30.01.2024). Original Publication: [Nat. Med.](#)

★ **Consumption of 100% fruit juice and body weight in children:** Based on the available evidence from prospective cohort studies, in this systematic review and meta-analysis, **1 serving per day of 100% fruit juice** was associated with **Body Mass Index (BMI) gain** among children. [MedNewsToday](#), 5 pages. (19.01.2024). Original Publication: [JAMA Pediatr.](#)

★ **40 years of adding more fructose to high fructose corn syrup:** The article discusses the excessive consumption of unpaired **fructose**, particularly from **high fructose corn syrup** and **apple juice**, and its potential health consequences. It highlights the **association** between excess-free-fructose intake and conditions such as fructose malabsorption, gut dysbiosis, asthma, coronary heart disease, and irritable bowel syndrome. The article also mentions the variability in individuals' absorption capacity and the need for more accurate intake estimates. Additionally, it touches on gene variants related to fructose absorption and the potential health risks posed by high-fructose corn syrup. [Nutr. J.](#), 19 pages. (02.02.2024).

★ **Global nutrition threatened by climate change-related wheat disease:** A fungal blast disease could reduce global **wheat production** by 13% before 2050, equating to 60 million tons lost annually, according to a new study. The fungus *Magnaporthe oryzae* is thriving under conditions created by climate change in tropical regions. The pathogen is predicted to have devastating effects on **human nutrition** in parts of South America, Southern Africa and Asia. [food ingredients 1st](#), 2 pages. (05.02.2024). Original Publication: [Nat. Clim. Chang.](#)

★ **The future of food:** The global **food systems** face significant challenges driven by population growth, climate change, geopolitical conflicts, crises, and evolving consumer preferences. A new review explores the complex aspects of the future of food, encompassing sustainable food production, food security, climate-resilient and digitalized food supply chain, alternative protein sources, food processing, and food technology, the impact of biotechnology, cultural diversity and culinary trends, consumer health and personalized nutrition, and food production within the circular bioeconomy. [Foods](#), 10 pages. (06.02.2024).

Fraud / Deception

★★ **Food fraud records: summary of data from 1980-2022:** Food fraud prevention and detection remains a challenging problem, despite recent developments in regulatory and auditing requirements. In 2012, the United States Pharmacopeial Convention created a database of **food ingredient fraud**. The objective of this research was to report on updates made to the database structure and to provide an updated **analysis of food fraud records**. Dairy, seafood, meat, herbs and spices are particularly prone to fraud. [JFoodProt](#), 34 pages. (16.02.2024).

Close up

New reports published by the [FSVO's early detection system](#) for food safety:

- **Is food safety in Switzerland impacted by the war in Ukraine?** (in German)
 - **Impact of mercury released from permafrost on food safety in Switzerland**
 - Signal Report: **Microbiological safety of plant-based convenience products** (Part 1) (in French)
 - Signal Report: **Too high protein diet** (in French)
 - Signal Report: **Human gut microbiome and food additives** (in French)
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★★★★ very important info ★★★ important info ★ interesting info

★★★★ **Survey:** In November 2023, we asked for your opinion as part of our survey on early detection for food safety. We warmly thank you for the numerous responses! The results of the survey are summarised in a [report](#) available on the FSVO website.

Microbiology

★★★★ **Disinfectant residues stimulate *Vibrio* biofilm formation:** Results revealed that exposure to **benzalkonium chloride** (BAC) residues induced physiological changes in ***Vibrio* biofilms**, leading to an increase in the number of injured and alive cells within the biofilm. The exact nature of the "injured" bacteria remains unclear, but it is postulated that BAC might heighten the risk of viable but non-culturable (VBNC) bacteria development. These VBNC bacteria pose a significant threat, especially since they cannot be detected using the standard culture-based methods commonly employed for microbiological risk assessment in aquaculture and seafood industries. [FrontMicr](#), 1 page. (18.12.2023).

★★★ **Temperature status of domestic refrigerators and risk of listeriosis:** This study provides insight into the **temperature profiles of domestic refrigerators** in the Netherlands and the impact on the number of **listeriosis** cases related to ready-to-eat (RTE) cooked meat products. **Elderly people** (65 years and older) had refrigerators with temperatures that were on average 0.6 °C higher than those of younger people (35 years or younger). Among all illness cases, the elderly represented nearly 90 %. [IntJFoodMicr](#), 1 page. (08.12.2023).

★★★ **Campylobacter species in Finnish beef liver:** 90 Finnish **retail beef livers** were studied to estimate the concentration of **Campylobacter species**. Overall, 44 (49 %) of the samples were positive for *Campylobacter* species, *C. jejuni*, *C. fetus* and *C. lari* being identified in 42 %, 8.9 % and 1.1 % of the samples, respectively. [IntJFood-Micr](#), 30 pages. (14.12.2023).

★★★ **Yersinia enterocolitica biovar 1A in the food chain:** *Yersinia enterocolitica* is an **underreported cause of foodborne gastroenteritis**. Little is known of the diversity of *Y. enterocolitica* isolated from food and which food commodities contribute to human disease. In this study, *Y. enterocolitica* was isolated from 37/50 **raw chicken**, 8/10 **pork**, 8/10 **salmon** and 1/10 **leafy green** samples collected at retail in the UK. Almost all (99%) food *Y. enterocolitica* isolates were **biotype 1A**. Around half (51%) of food samples contained an ST previously isolated from UK **human sources**. [IntJFoodMicr](#), 37 pages. (21.12.2023).

★ **Helicobacter pylori infection and the risk of incident Alzheimer's disease:** The study, investigated whether a clinically apparent *Helicobacter pylori* (*H. pylori*) infection increased the risk of Alzheimer's disease in people aged 50 and older. A team of McGill University researchers analyzed health data of over 4 million people in the United Kingdom aged 50 and above between 1988 and 2019. It found that people with **symptomatic *H. pylori*** infection had an 11% higher risk of developing **Alzheimer's disease**. [EurekAlert](#), 1 page. (22.12.2023). Original Publication: [Alzheimer's Dement](#).

★ **Resistance of Listeria monocytogenes isolates recovered from food-processing facilities:** Sanitisers are widely used in cleaning food-processing facilities, but their continued use may cause an increased **resistance** of pathogenic bacteria. Several genes have been attributed to the increased sanitiser resistance ability of *L. monocytogenes*. A new study determined the presence of sanitiser resistance genes in Irish-sourced *L. monocytogenes* isolates and explored the association with phenotypic sanitiser resistance. In summary, this investigation highlights the **prevalence of specific sanitiser resistance genes** in *L. monocytogenes* isolates from Irish food-processing settings. [Microorganisms](#), 12 pages. (15.12.2023).

★ **Hypervirulent Clonal Complex (CC) of Listeria monocytogenes in fresh produce:** A recent study aimed to determine the **prevalence** and virulome of *Listeria* in **fresh produce** distributed in urban communities. A total of 432 fresh produce samples were collected from farmer's markets in Michigan and West Virginia, USA, resulting in 109 pooled samples. Forty-eight of 109 samples (44.0%) were contaminated with *Listeria spp.* *L. monocytogenes* serotype 1/2a and 4b were recovered from **radishes**, **potatoes**, and **romaine lettuce**. Four clonal complexes (CC) were identified and included hypervirulent CC1 (ST1) and CC4 (ST219) of lineage I. [FrontMicr](#), 10 pages. (08.01.2024).

Chemistry

★★★ **More plastic in bottled water than previously known:** Using a new microscopic technique that can detect minute particles of **plastic in bottled water**, researchers have discovered that, on average, one liter of water contains approximately 240,000 detectable plastic fragments, which is **10–100 times greater than previous estimates** based on larger sizes of plastic. The researchers warn that these nanoplastics can pass into human blood, cells, and placenta with unknown health effects. [FoodSafetyMag](#), 3 pages. (09.01.2024). Original Publication: [PNAS](#).

★★★ **Isolation and identification of microplastics in infant formulas:** A new study aimed to determine the degree of **contamination of infant formula** with microplastics (MPs). A total of **30 products** were subjected to analysis. Microplastics were **detected in all tested samples**. The most frequently identified polymers were polyamide, polyethylene, polypropylene, and poly(ethylene terephthalate). The **daily intake of MPs** by children fed exclusively infant formula was estimated to be approximately **49 ± 32 MPs**. [FoodChem](#), 10 pages. (15.05.2024).

★ **PFAS alternatives:** Due to increasing regulations on the production and consumption of legacy per- and polyfluoroalkyl substances (PFAS), the global use of **PFAS substitutes** increased tremendously, posing serious environmental risks owing to their **bioaccumulation**, **toxicity**, and **lack of removal strategies**. A recent review summarized the spatial distribution of alternative PFAS and their ecological risks in global **freshwater** and marine ecosystems. [WaterRes](#), 10 pages. (15.02.2024).

★ **Arsenic and adipose tissue:** Arsenic-contaminated **drinking water** can induce various disorders by disrupting lipid and glucose metabolism in adipose tissue, leading to **insulin resistance**. It inhibits adipocyte development and exacerbates insulin resistance, though the precise impact on lipid synthesis and lipolysis remains unclear. A recent review aims to explore the processes and pathways involved in adipogenesis and lipolysis within adipose tissue concerning **arsenic-induced diabetes** [Environ Sci Pollut Res Int.](#), 10 pages. (02.01.2024).

★ **High levels of chromium in applesauce traced to lead poisoning outbreak:** In addition to extremely high levels of lead, the FDA has found elevated levels of **chromium** in cinnamon applesauce products marketed for children. [FSN](#), 1 page. (06.01.2024).

★ **Cardiovascular adverse effects and mechanistic insights of arsenic exposure:** A recent review discusses the cardiovascular adverse effects of **arsenic exposure**, focusing on the **toxicological and cardiovascular impacts** of arsenic in in vitro cardiac and vascular models. The mechanisms of arsenic-induced cardiovascular impairments include oxidative stress, epigenetic modifications, chromatin instability, subcellular damage, and premature aging. The review also highlights the distinct responses of different types of cardiac and vascular cells to arsenic exposure, and the specific mechanisms involved in causing arrhythmias and vascular lesions. [Environ Chem Lett](#), 10 pages. (09.01.2024).

Nutrition

★★ **US adults consume a meal of calories a day from snacking:** Researchers analyzing data from surveys of over 20,000 people found that Americans averaged about **400 to 500 calories in snacks a day** – often more than what they consumed at breakfast – that offered little nutritional value. [EurekAlert](#), 3 pages. (15.12.2023). Original Publication: [PLOS glob. public health](#).

★★ **Artificial intelligence and nutrition:** The results of a new study suggest that **artificial intelligence (AI)** can be a useful and convenient tool for people who want to know the energy and macronutrient information of their foods. Although AI chatbots cannot replace nutritionists, they may provide **real-time analysis of foods**, and the capacity to harness AI technology in a **supportive role** may fundamentally transform the way nutritionists communicate with patient. [EurekAlert](#), 1 page. (27.12.2023). Original Publication: [JAMA Netw Open](#).

★ **Psychological impact of the widespread availability of palatable foods:** A recent study aimed to investigate the role of the **psychological impact of environments** rich in palatable foods on three aspects of eating behavior: **cognitive restraint (CR)**, **uncontrolled eating (UE)**, and **emotional eating (EE)**. This study had a cross-sectional design in which data were collected online from 413 subjects. CR, UE, and EE were positively predicted by the motivation to consume palatable foods in varying proximity, suggesting that the presence of food and, more importantly, its general availability may be important determinants of eating behavior, particularly UE and EE. [Foods](#), 15 pages. (22.12.2023).

★ **High fat diets - dysregulation of genes:** High-fat diets (HFDs) have been linked to several diseases, including **obesity, diabetes, fatty liver, inflammatory bowel disease (IBD)** and **colon cancer**. In this study, researchers examined the effects on intestinal gene expression of three isocaloric HFDs that differed only in their fatty acid composition - **coconut oil** (saturated fats), conventional **soybean oil** (polyunsaturated fats) and a **genetically modified soybean oil** (monounsaturated fats). Network analysis shows that genes involved in metabolism tend to be **upregulated** by the HFDs while genes related to the immune system are **downregulated**; neurotransmitter signaling was also **dysregulated** by the HFDs. [EurekAlert](#), 2 pages. (03.01.2023). Original Publication: [Sci Rep](#).

★ **'Veganuary' cuts fat and cholesterol but also reduces vitamins and minerals:** A study analysed omnivores and vegetarians aged 18 to 60 who signed up for "Veganuary", comparing them to vegans, vegetarians and meat-eaters who kept eating as normal. Their findings show that there are positive and negative effects on the diet for people who take part. **Omnivores** who take part in "Veganuary" could cut their **saturated fat** and **cholesterol** intake but may also miss out on vital **micronutrients**, such as iodine and vitamin B12. [MedicalXpress](#), 2 pages. (02.01.2024). Original Publication: [Nutrients](#).

★ **Association of plant-based diets with total and cause-specific mortality:** A new study investigated the association between **plant-based diet indices** (PDIs) and **mortality**, considering **socioeconomic deprivation levels**. The research, which included 189,003 UK Biobank participants, found that higher overall PDI and healthful PDI were associated with reduced all-cause mortality, while the unhealthful PDI was linked to an increased risk of death. [Eur. J. Nutr.](#), 10 pages. (09.01.2024).

Allergy

★ **Allergenicity of alternative proteins:** A **review article** discusses the current research status of allergenicity studies on alternative proteins, analyzing research keywords, hotspots, and trends using a mixed-method approach of **bibliometric analysis** and **literature review**. The study highlights the significant variations in the type and amount of allergens found in alternative proteins, with a focus on **plant-based proteins** and cross-reactivity of **insect proteins**. [CritRevFoodSciNutr](#), 10 pages. (08.01.2024).

Fraud / Deception

★ **International adulterated olive oil scandal uncovered:** The investigation, carried out by the Guardia Civil in conjunction with Italy's carabinieri and Europol, led to raids in both countries. Suspicions were first raised when Guardia Civil officers discovered "a series of anomalies" while inspecting a lorry that was transporting **olive oil** in Ciudad Real region. They soon uncovered a two-pronged operation in Spain and Italy that was designed to distribute adulterated olive oil on the global market. It led to 11 arrests and the seizure of over 260 000 litres of olive oil unfit for consumption. [TheGuardian](#), 3 pages. (04.12.2023). Original Publication: [Europol](#).

Close up

Summary of [FSVO's early detection reports](#) for food safety in 2023:

- Signal Report: **Vibrio spp.** (non-cholera vibrios) (PDF, 284 kB, 18.10.2023)
 - Signal Report: **Release of mercury from permafrost** (PDF, 292 kB, 18.10.2023)
 - Signal Report: **Escherichia albertii** (PDF, 360 kB, 22.06.2023)
 - Signal Report: **Meat analogues** (PDF, 257 kB, 22.06.2023)
 - Signal Report: **Clostridioides difficile** (PDF, 192 kB, 22.06.2023)
 - Signal Report: **Arcobacter spp. in food** (PDF, 136 kB, 07.02.2023)
 - Signal Report: **Bacillus thuringiensis** (PDF, 116 kB, 07.02.2023)
 - Signal Report: **Tick-borne encephalitis virus (TBEV)** (PDF, 127 kB, 07.02.2023)
 - Signal Report: **Salmonella Napoli** (PDF, 307 kB, 07.02.2023)
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