FRI eNews provides updates on research and events at FRI and UW-Madison and other current food safety news.

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In the News

The recently identified (but almost a decade old) ***Listeria monocytogenes*** **outbreak** linked to **queso fresco** and **cotija cheese** from **Rizo-Lopez Foods of Modesto, Calif.**, has led to serious illnesses and deaths, inspections and investigations, and **many, many recalled products**:

- As of Feb. 12, 26 cases have been reported, which have been associated with 23 hospitalizations and two deaths.
- Cases from this outbreak have been reported in 11 states, with more than half of the cases in **California, Colorado, and Arizona**.
- Cases from this outbreak strain have been occurring for at least 9 years.
- Of 22 people who were sickened that were interviewed, 16 remembered eating **queso fresco, cotija, or a similar cheese**.
- CDC previously investigated illnesses linked to queso fresco in 2017 and 2021 but was unable to confirm a source.
- In December 2023, **the Hawaii State Department of Health's Food and Drug Branch found the outbreak strain in a sample of aged cotija cheese made by Rizo-Lopez Foods during routine sampling**. FDA then inspected the Rizo-Lopez Foods facility and **found the outbreak strain on a container** where cheeses were kept prior to packaging.
- **A large variety of cheeses, yogurt, sour cream, and products made with the cheeses (for example, sandwiches, wraps, taco and salad kits, etc.**) produced by Rizo-Lopez Foods but sold under many different brand names have been recalled from retail locations in the U.S. and Canada.
- **USDA FSIS** has also recalled poultry and other products (burritos, enchiladas, appetizers, etc.) that contained Rizo-Lopez cheeses.

Additional products containing potentially under-processed **Coppa** were recalled on Feb. 12 in association with the ***Salmonella*** outbreak linked to **charcuterie meats. As of mid-January, this outbreak** has resulted in at least 47 illnesses, ten of which required hospitalization. The Minnesota Department of

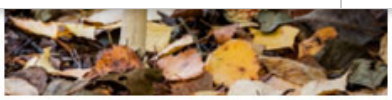
Expiration dates on these products range from April to July 2024, highlighting the importance of communicating these recalls effectively to consumers to prevent additional cases.

The source of the lead and chromium contamination in cinnamon applesauce pouches that has led to 422 cases (per CDC, having a blood lead level of 3.5 µg/dL or higher after consuming one of the recalled products within three months) has been traced to Carlos Aguilera of Ecuador. Carlos Aguilera (which is not operating now) was the processor of the ground cinnamon that was supplied to Negasmart and then to Austrofoods for use in the applesauce packets. **The unprocessed cinnamon sticks were from Sri Lanka, and testing of these by Ecuadorian regulatory scientists found no lead contamination.** As discussed last month, the relative levels of these two minerals are consistent with the presence of **lead chromate ($PbCrO_4$)**, a toxic compound that has a dark yellow color that has been used **as an economically adulterant in spices such as turmeric.**

Other recent outbreaks around the world include the following:

- A ***Bacillus cereus*** outbreak linked to **commercial porridge products** sickened 23 children in Norway. The common ingredient in the products was **black oat** from the same production lot. Black oat is believed to have been the primary oat crop grown in Europe prior to the introduction of common oat and is commonly used now for forage or as a cover crop.
- Around 150 people in **Japan** were sickened with food poisoning after consuming **sushi rolls** at a restaurant in Himeji City. The cause was attributed to ***Staphylococcus aureus***, which was found to be present on the hands and fingers of one of the restaurant workers.

- Two children in **France** are undergoing lengthy and difficult recoveries after being infected with **pathogenic *E. coli*** after eating **morbier** (a semisoft cheese made from raw milk). The morbier involved in the two cases was purchased in different supermarkets. These cases may be related to six other recent cases of **hemolytic uremic syndrome** in children associated with the consumption of ***E. coli* O26:H11-contaminated morbier** cheese in France in late 2023.
- A **107-night world cruise** has been interrupted by a **gastrointestinal disease outbreak** that has left more than 100 passengers (of ~1,800 total) and 16 crew members (of 960) with diarrhea and vomiting. As of Feb. 13, the Queen Victoria cruise ship has reached Honolulu, and the outbreak (which has not yet been formally associated with a pathogen) is considered to be “under control,” with case numbers dropping.
- In 2023, more than 1,300 people were sickened and 16 people died in **China** from **mushroom**



between May and October. More than **97 poisonous mushroom species (including 12 that were newly identified as poisonous)** were cited as contributing to these poisonings. In many cases, however, the mushroom species could not be identified, hindering treatment.

Regulatory News

FDA has released **two newly revised (but still "draft") sections of the draft guidance "Hazard Analysis and Risk-based Preventive Controls for Human Food: Draft Guidance for Industry."** The newly revised sections (originally released in 2016) include the **Introduction** and **Appendix 1 (Known or Reasonably Foreseeable Hazards)**. Appendix 1 now includes much more background on the development and intended use of the tables of potential hazards for various foods.

Newly proposed legislation **in Illinois seeks to ban the same four food additives (brominated vegetable oil, potassium bromate, propylparaben, and red dye No. 3) that California banned last year**, while going farther by including **titanium dioxide (TiO_2)** in the list of potentially banned additives. (As discussed in the December eNews, California initially planned to ban TiO_2 as well, but removed it from their ban. In November, the Joint FAO/WHO Expert Committee on Food Additives found little evidence that oral TiO_2 was genotoxic, although cautioned that better testing methods for particulates/ nanoparticles such as TiO_2 are needed. FDA has continued to assert that there are no safety concerns related to TiO_2 used as a color additive). Similar legislation is being proposed in **New York state**. Both the California ban and the Illinois proposed ban give manufacturers, distributors, and retailers until 2027 to comply. Two other food additives, **butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT)**, have also been discussed by an Illinois official as **targets for more research** based on concern related to potential carcinogenicity.

EFSA released an **updated risk assessment of inorganic arsenic in foods**, concluding that a reference point of 0.06 µg/kg bw per day is a conservative estimate of the lowest dose of inorganic arsenic that could be associated with increased induction of cancer after exposure. **This level is considerably lower** than the range of reference point values (0.3 to 0.8 µg/kg bw per day) that EFSA proposed in 2009.

Current Literature

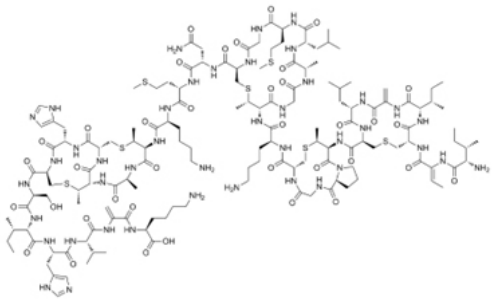
Two new studies have found ways in which **bacteriophage** can successfully attack ***L. monocytogenes*** present in **biofilms**:

- A new study has identified a bacteriophage (closely related to the phage in the commercial product Listex P100) that reduced ***L. monocytogenes*** present in **biofilms within simulated dairy processing environments** by **2 logs within two hours**.
- Another new report demonstrated that a **six-hour**

lactic acid) with a ***Listeria*-specific phage cocktail** yielded a **3-4 log reduction of *L. monocytogenes* present as a biofilm on a food contact surface**.

A new study has explored how relatively **low levels of oil within foods can greatly increase the heat resistance of *Clostridium sporogenes* spores**. The addition of oil at 5% to a sauce increased the D-value of *C. sporogenes spores* in the sauce from 1.1 min to 5.7 min at 92°C (similar to the D-value of the spores in beef), while higher temperatures of 95 or 100°C resulted in D-values that were even higher than those found in beef. The type of oil did not affect the increase in D-value. Migration of fat from beef into a sauce during braising, for example, may thus significantly alter spore heat resistance. Microstructure analysis found that the **presence of oil appeared to protect the exosporium (the outer spore layer)**.

A report from the Netherlands involving **1,020 consumers** found that the **refrigerators of elderly people had an average temperature that was 0.6°C higher than refrigerators of younger people**. In addition, the study found that the **mean temperature for an upper shelf in a refrigerator was significantly higher (7.7°C, SD 2.7°C) than that of the bottom shelf (5.7°C, SD 2.1°C)**. The researchers recommended that the importance of storing *Listeria*-associated foods such as RTE cooked meat products at the recommended temperature on bottom or middle shelves be communicated to consumers (particularly elderly ones).

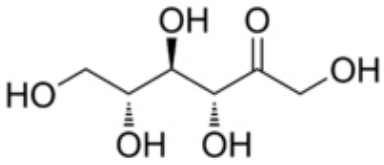


How do **nisin** (pictured right) **and related lantibiotic compounds influence the human gut commensals and pathogens,** and can such knowledge be used to develop lantibiotics that are ideally suited for food preservative (or therapeutic) uses? A new study used **bioinformatics** to identify **new nisin-like lantibiotics that are encoded by gut bacteria**. Following overexpression and purification, these compounds were tested against human pathogens and gut commensals. Comparison of antimicrobial activity with the structures of these lantibiotics (which are ribosomally synthesized and post-translationally modified **polycyclic peptides**) has identified **certain regions of these lantibiotics that are critical for antimicrobial activity and may guide future development of food preservatives and therapeutics**.

Other News

A Washington state company worked with **state regulators, FDA, and the Association of American Feed Control Officials (AAFCO**) to develop a system that **consumers can use to turn their food waste into chicken feed**. **Unlike a typical kitchen compost bucket, the system dehydrates food scraps to less than 12% moisture each night, creating "clean, dry scraps."** These dried scraps can be sent back to the company where it is used in chicken feed (or consumers

Although no food safety problems appear to have occurred, **Subway may regret its switch last year from pre-sliced meat to meat sliced onsite using deli slicers**. The restaurant chain believed that **freshly sliced meat would improve the quality of sandwiches for consumers**. However, the installation of the new deli slicers does not appear to have increased sales or improved sandwich quality. Importantly, franchises have reported the onsite slicers **require more employee time** (for slicing but also cleaning the slicers) and generate more food waste.



The natural sugar **allulose** (also known as psicose, pictured left) is a **monosaccharide** (an epimer of D-fructose) present at low levels in some fruits, molasses, and other foods. Allulose is about 70% as sweet as sucrose (and tastes like sugar without bitterness), bakes and caramelizes like sucrose, but has less than 10% of the calories of sucrose. FDA considers allulose to be Generally Recognized as Safe and doesn't require it to be labeled as an "added sugar" or included in the total sugar levels on labels. This is because allulose is not metabolized like other sugars and **does not raise blood glucose levels** (by blocking intestinal absorption of glucose and does not contribute to dental caries. **What's the downside, you ask?** It is relatively expensive to manufacture, as it is usually made via enzymatic conversion from beet sugar or maize. However, researchers at University of California-Davis have used CRISPR technology to modify a nonpathogenic strain of *E. coli* to allow it to convert glucose into allulose. The approach used not only shows promise to **significantly reduce the cost of allulose** but could also **facilitate development of other rare sugars.**

Are **glucagon-like peptide-1 (GLP-1) receptor agonists** (the medications for **type 2 diabetes and now obesity that are dominating the news and upheaving healthcare**) also impacting the **food industry**? Read here for a discussion with food and beverage industry experts as to the effects they think the medications might (or might not) have.

Several free webinars related to food safety are coming up (or can still be watched online):

- IAFP is offering a free seminar on food safety culture on Tuesday, Feb. 20 at 1 p.m. ET.
- IAFNS recently hosted a seven-part webinar series on **sodium reduction in the food supply** from Jan. 22–31, with FRI's associate director **Kathy Glass** speaking on the Jan. 25 webinar about the effects of sodium reduction on food safety and quality). Recordings of these webinars are now posted here.

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