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

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FRESH Seminar Series

FRI's **FRESH seminars** are continuing this month. All seminars are given as free webinars and are held on Tuesdays at 11 a.m. central time.

- Nov. 14: **Dennis Romero** (International Flavors & Fragrances) will present "**What's new in getting beneficial microbes from food?**" This seminar will also be held in person in 205 Babcock Hall.

FRI News

A new paper from the lab of FRI executive committee member **JP van Pijkeren** demonstrates that an elegant **bioluminescent peptide tagging system** can be used in a **broad range of lactic acid bacteria (LAB) as well as *Bifidobacterium bifidum* to track recombinant protein production**. This system was shown to be more sensitive and accurate than immunoassays and **much faster than (and as accurate as) conventional plate counts**. The research also provides data supporting use of the system *in vitro* and *in situ* applications (including **transit of the bacteria through the GI tract** following oral delivery to mice), providing proof-of-concept for the system in applications such as monitoring bioreactor production of recombinant proteins and tracking probiotics in the gastrointestinal system. An image representing this work was selected to be a future featured image on the mBio website.

FRI graduate fellowship recipients **Megan Dixon** and **Vicky Lason Harrod** (current and former

written for kids to explain **how plant-eating insects and phytobacteria that cause plant diseases help *Salmonella* access plant tissue and contaminate produce, potentially leading to human illnesses.** *Image reproduced from Dixon M, Harrod V, Groves R and Barak J (2023) The "Friends" That Help Dangerous Bacteria Get Into Your Salad. Front. Young Minds. 11:1124186. doi: 10.3389/frym.2023.1124186*

FRI executive committee members **Kristin Schill** and **Sabine Pellet** were the organizers for the **59th Annual International Botulism Research Coordinating Committee Meeting**, held in Madison on Oct. 23–25.

Besides organizing and presenting at this meeting, in recent weeks Kristin also recently met with FRI sponsor **Revela Foods**, taught several **Better Process Cheese School** courses, and served as an **instructor and presenter at the Advanced Meat Microbiology and Food Safety workshop**, all while also managing FRI's Applied Food Safety Lab!

In the News

A multistate outbreak of ***Salmonella* Thompson** has sickened 73 people in the last month, with 15 requiring hospitalization. As of Oct. 24, the outbreak was reported by CDC and FDA to be linked to Gills Onions fresh diced yellow onion, diced onions and celery, diced mirepoix, and diced red onions; the company has recalled these products. *Salmonella* outbreaks due to this serovar have been reported most commonly with beef, chicken, and vine-stalk and leafy vegetables, but a 2021 *Salmonella* Thompson outbreak was associated with sushi-grade tuna and salmon that was believed to have become contaminated when processed at a facility in Colorado. The serovar implicated in the 2020 outbreak associated with red, white, yellow, and sweet yellow onions was *Salmonella* Newport.

Other noteworthy outbreaks reported recently in the U.S. include the following:

- In southern Virginia, an unknown number of people were sickened with a gastrointestinal illness in early September at the **Blue Ridge Rock Festival**. One patient reported that they tested positive for **enteropathogenic *E. coli*** after

of Health is investigating the illnesses and reports of **unsanitary conditions at the festival grounds.**

- **Another festival** (The Belgrade Fall Festival in Montana) was associated with a foodborne disease outbreak last month. Of the ~200 gastrointestinal illnesses reported by festival attendees, all but one of those sickened reported eating **beef brisket**, the "cornerstone of the festival." The local chamber of commerce has been smoking beef rounds on a spit overnight in the same way for 60 years, serving it free to the town as a "round for the town."
- **At least seven children in Tennessee** required hospitalization due to **Shiga toxin-producing *E. coli* infections** following visits to an **animal exhibit** during an elementary school class field trip to the Appalachian Fairgrounds in late September. Secondary infections among siblings of some students have also occurred.

The commercial kitchen that was linked to the ***E. coli* O157:H7 outbreak last month in Calgary daycare facilities** has been fined at least $120,000 so far because it **operated at some locations without a license**. As of late September, the number of children sickened remained at 351, with 37 children hospitalized. **Hemolytic uremic syndrome was diagnosed in 22 of those hospitalized**, and four children are still hospitalized and on dialyses.

The death of a U.S. child has again led to the recall of a **novelty food product**. Last month, after a Massachusetts boy died shortly after eating a **Paqui "One Chip Challenge" chip**, the chips were "voluntarily retrieved"; however, the chips are still available at online retailers. This month, the **choking death** of a 7-year-old New York girl has led to the recall of **Slime Licker Sour Rolling Liquid Candy**. The product's dispenser contains a rolling ball which can be dislodged from the dispenser to potentially block the throat.

As discussed in the July FRI newsletter, the mysterious **2022 outbreaks of serious liver and other toxicities linked to direct-to-consumer products** Daily Harvest's Lentil + Leek Crumble and a Revive Superfoods Smoothie have been associated with an unusual ingredient, **tara flour**, which contains a non-protein amino acid (baikiain) shown to cause liver toxicity in mice. The **Canadian Food Inspection Agency** has issued a notice advising food industries to avoid selling or purchasing tara protein powder (tara flour) or any products containing this ingredient. In the U.S., the tara flour outbreaks have been considered as evidence that the **GRAS system for new ingredients needs to be overhauled.**

Most compellingly, this **food industry insider** recently described **her debilitating personal experiences** as one of the more than 300 people sickened by Daily Harvest's product while arguing for better regulatory oversight for novel ingredients.

Highly pathogenic avian influenza season has started again, with commercial turkey flocks in South Dakota, Utah, Minnesota, and Iowa affected, in addition to wild birds in many states. For more about the currently circulating virus (H5N1) and its evolution and spread to wild birds (including

FDA has cautioned pet owners not to feed certain lots of **Darwin's Natural Pet Products raw cat and dog food** to their pets due to contamination (confirmed by FDA testing) with ***Salmonella*.** To date, **the manufacturer, Arrow Alliance Inc. has not recalled any of the affected product lots**. In addition to potentially affecting animal health, pets can become asymptomatic carriers of the bacteria and pass the organism on to humans.

Government and Regulatory News

Despite FDA's assertion that the additives are safe, **California has banned four chemicals from being used in processed foods sold and produced in the state**, effective Jan. 1, 2027. The four chemicals (**brominated vegetable oil, potassium bromate, propyl paraben and Red Dye No. 3**) are still allowed in other states, although the additives are banned from foods in Europe (except candied cherries, which can still contain Red Dye No. 3). While numerous individuals and consumer groups applaud the move, food regulatory experts have expressed concerns that the scientific justification for the bans are weak. Furthermore, this precedent could lead to similar moves by other states (such as New York), leading to a patchwork of inconsistent regulations across the country and undermining consumer confidence in FDA.

FDA is continuing to add new chapters to its **Draft Guidance on Preventive Controls for Human Food**, which was first issued in 2016. **Chapter 11 (Food Allergen Program)** explains how to establish and implement a food allergen program to prevent food allergen cross-contamination and use proper labeling on finished foods. **Chapter 16 (Acidified Foods)** was written to help manufacturers of acidified foods meet both the requirements of the acidified foods regulations and the preventive controls for human foods rule.

FDA issued a warning regarding the use of probiotics in preterm infants following the death of a preterm infant (birth weight < 1,000g) who was administered a probiotic (Evivo with MCT Oil) as part of in-hospital care. The infant developed sepsis caused by ***Bifidobacterium longum*** prior to her death. The letter also reminds healthcare providers that FDA has not approved any probiotic product for use as a drug or biologic product in infants.

The European Union has reduced the maximum allowable limits for the use of nitrite and nitrate in foods by about 20%, effective in two years, falling short of the full ban that some consumer groups had wanted.

The European Union's approval of the herbicide glyphosate (the active ingredient in "Roundup") expires Dec. 15. In a recent vote to extend this approval for an additional 10 years, **neither the required votes to block nor to pass this extension were obtained**. Another vote will take place in November.

plastic items including plastic cutlery, plates, cups, trays, and bowls is banned in England. The ban applies to retailers, restaurants, and other food vendors, and covers all types of plastics, including those that are biodegradable, compostable, or recycled.

A free, detailed white paper on **food traceability**, including **technology, regulatory initiatives, and infrastructure and implementation hurdles**, has been published through the joint efforts of the Council for Agricultural Science and Technology (CAST) and the Institute of Food Technologists (IFT).

The **National Advisory Committee on Microbiological Criteria for Foods (NACMCF)** has released its responses to questions posed by FDA regarding ***Cyclospora cayetanensis* in produce**.

Recent Literature

Microbiology of plant-based dairy analogs and their ingredients was the focus of several new articles:

- **Microbial contaminants of 88 plant-based ingredients** (pulses, cereals, pseudocereals, coconut, almonds, and cashews) were investigated in one recent report. Many samples contained a high proportion of spore-forming bacteria, with ***Bacillus subtilis*** and ***Bacillus cereus*** group members and ***Clostridium sporogenes/tepidum*** identified as the main aerobic and anaerobic spore-forming species, respectively.
- A new review article explores the **microbiology of fermented soy foods** and suggests that **knowledge gained from such products and their microbiota could be applied to plant-based cheese analogues to enhance their flavor and quality**.
- Another new study tested the ability of **different adjunct bacterial cultures** with various starter cultures to improve **fast acidification** (and improve safety) and **affect gel hardness and flavor of pea-protein-based cheese analogs**. The use of adjunct cultures reduced “beany” flavors but also resulted in lower levels of some dairy-like compounds.

A new case report provides a vivid depiction of the unusual “flagellate dermatitis” that can rarely occur several days after eating **raw or undercooked Shiitake mushrooms**. *(Photo courtesy of DermnetNZ.org)*

The botulism outbreak in France last month during the Rugby World Cup linked to home-canned sardines served at a wine bar in Bordeaux has already been the subject of a rapid publication in the journal Eurosurveillance. The outbreak, which caused 15 illnesses and one death, was found to be associated with **type B botulinum neurotoxin**; of the eight illnesses described in this report, all received antitoxin within 19 hours of ICU admission. The death occurred in an individual who

Two new reports on **norovirus detection** have been recently published:

- A new review article discusses **immunological and nucleic-acid based methods** as well as the more recent use of aptasensor, affinity peptides, nanoparticles, and microfluidics in norovirus detection.
- **The great genetic diversity due to the rapid evolution of norovirus** makes surveillance using nucleic-acid-based technologies challenging. A new study demonstrated significant variation in performance among norovirus PCR assays, suggesting that some assays may miss certain virus strains. **A straightforward method for evaluating the performance of norovirus detection assays was developed** to help improve virus surveillance.

UW-Madison and Wisconsin News

The 2nd annual Wisconsin Meat Industry Coalition Conference will be held Nov. 1–3, 2023, at the Chula Vista Resort in the Wisconsin Dells. The meeting is intended for **livestock producers and meat processors of all sizes as well as others affiliated with supporting these groups**. More details can be found here.

The 2023 Wisconsin Food Safety Summit, hosted by the **UW-Madison Meat Science and Animal Biologics Discovery (MSABD) Extension program** and **USDA-FSIS**, will be held on Nov. 8 at the MSABD Building from 9 a.m. to 4:15 p.m. This meeting will address current topics in food safety, featuring speakers from USDA-FSIS, the meat industry, and UW-Madison. FRI executive committee member **Jeff Sindelar**, FRI associate director **Kathy Glass**, FRI outreach coordinator **Adam Borger**, and numerous FSIS personnel will be speaking at this meeting.

MSABD is also hosting its **Wisconsin Harvest and Fabrication School** on Nov. 14–16. Learn more and register here.

MSABD and FRI recently hosted another successful **Advanced Meat Microbiology and Food Safety Short Course**, which featured a number of **FRI executive committee members and staff** as well as outside experts as instructors. Course participants are pictured below with **Jeff Sindelar** on the far right).

14 at 5:30 p.m. at the Carson Gulley Center (1515 Tripp Circle). Female and other underrepresented gender grad and undergrad students are welcome to share their work at this event. Learn more or sign up to present here.

Asma Hatoum (University of Illinois, Urbana-Champaign) will present "**Mechanisms of defense and counter-defense in the battle between bacteria and their viruses**" on Thursday, Nov. 9, at 3:30 p.m. in Ebling Symposium Center in the Microbial Sciences Bldg.

Other News

Two recent news stories highlight the **intersection of artificial intelligence and food safety**:

- **A proliferation of books produced by artificial intelligence on edible wild plants** has raised concerns from foraging experts that these books may lead readers to mistakenly identify and eat wild plants with dangerous results.
- What does **ChatGPT** say about food safety? You can read its report here.

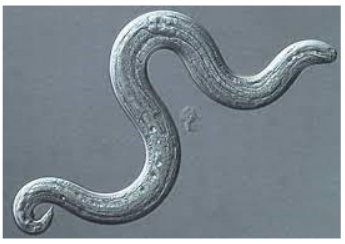
Watch comedian **John Oliver** discuss his novel solution **to leafy greens outbreaks** in this YouTube video. According to at least two FRI staff members, this video is worth watching!

Special eNews Halloween Addendum

Vampires, take note! **Whole-milk yogurt**, especially the fat and protein components of the yogurt) was shown to **reduce 99% of the nasty sulfur-based volatiles associated with raw garlic**. Still untested: the ability of the yogurt to reduce garlic breath in people or its ability to reduce the lethality of garlic to vampires.

Don't garden without gloves if you have been playing with an evil cat! Present within soil as spores, ***Clostridium chauvoei* is considered one of the most pathogenic of *Clostridium* species** and causes the deadly **blackleg disease in cattle**. Spores of this

and produce toxin, myonecrosis, edemic lesions, and fever result, rapidly followed by lameness and **death**. Of the three documented human infections by *C. chauvoei* that have been documented, two led to death following fulminant gas gangrene and neutropenic enterocolitis. The third, a woman who is believed to have been **infected when gardening in her bare hands, which were covered with recent cat scratches**, survived, but only after a very long and terrifying series of complications.



Another reason to avoid things grown in dirt such as salads (or drinking from your garden hose) in the future: **rat lungworm** (*Angiostrongyliasis cantanensis),* a **parasite usually associated with rats that can also infect snails and slugs**. **Humans who eat undercooked snails or accidentally ingest an infected slug in a salad can also be infected.** In humans, the rat lungworm often migrates to the central nervous system and the brain, where it can be asymptomatic or cause disease ranging from mild neurological symptoms to severe paralysis and even death. Rat lungworm (the subject of a recent documentary film) is **now established in rats within the southeastern U.S. and is believed to be spreading rapidly…**

And finally, not for the faint-hearted: Read here to learn **why 11th to 15th century Europeans were into eating mummies (and other embalmed human bodies)!**

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