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

View this email in your browser

FRI News

Congratulations to FRI's **Kathy Glass**, who, after a long and distinguished career, **has officially retired from the University of Wisconsin-Madison** after ~40 years of service. However, "retirement" does not mean that she is disappearing! As an emeritus scientist, **Kathy will continue to be actively involved with FRI and the food safety world**. Thank you, Kathy, for your many important contributions to food safety and to FRI! We are glad you will still be an important part of FRI!

Kathy recently spoke to Madison's Channel3000 news about the **large number of recent foodborne disease outbreaks** and potential **food regulatory changes**; you can read her comments here.

Brieana Gregg, recipient of the 2023 FRI Graduate Research Award and the 2023 John Cerveny Travel Award and former member of FRI affiliate faculty member **Sabine Pellett's lab**, along with other members of the Pellet lab, recently published a report demonstrating how **botulinum neurotoxins (BoNTs)** can be produced at high levels in a stable form in the related organism *Clostridium tetani*. This finding is expected to **greatly facilitate purification of BoNTs to allow for better characterization of these protein toxins (including atoxic BoNTs for use as controls in animal-free BoNT assays) and could aid in production of antitoxins.**

Also in the **Pellet lab**, research specialist **Miriam Guevara** won the **best poster award** at the **2024 Interagency Botulism Research Coordinating Committee Meeting in November**, where she presented her collaborative work with FRI executive committee member **Jae-Hyuk Yu** and his former graduate student **Dasol Choi** investigating the effects of a **novel broad-spectrum antimicrobial on *C. botulinum***.

FRESH seminars will resume soon! **Have a suggestion for a topic or speaker for a FRESH seminar?** Contact FRI outreach coordinator **Adam Borger** at adam.borger@wisc.edu.

Registration is open for **FRI's Better Process Cheese School** in Madison, Wisc., March 25–26.

2025 at the Hilton Garden Inn - O'Hare Airport. FRI executive committee member **Kristin Schill** along with the Kaitlyn Casulli (University of Georgia) and Ann Charles Vegdahl (Cornell) will teach this course.

Save the date (May 20–21, 2025) **for the FRI Annual Spring Meeting** in Madison, Wisc.

FRI is accepting applications now through Friday, Feb. 7 for its **2025 Summer Undergraduate Research Program in Food Safety**, which will be held will be held May 27 through Aug. 1. Contact Adam Borger at adam.borger@wisc.edu for more information.

Food Safety News

Highly pathogenic avian influenza (HPAI) H5N1 clade 2.3.4.4b genotype B3.13 **in cows and milk** continues to be an important topic in the news.

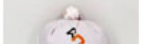
HPAI in Human Foods

- Researchers from USDA and FDA published **HPAI testing results for U.S. retail cheese, butter, ice cream, and other dairy products**. While viral RNA was found in 17.4% of the 167 dairy product samples tested, **no samples contained live virus**.
- FDA announced a new domestic sampling assignment to **collect and test aged raw cow's milk cheeses for H5N1**, beginning in December and to be completed by March 2025.
- States representing 65% of the nation's milk supply have now enrolled in **USDA's National Milk Testing Strategy** that was announced last month.

HPAI in Animals

- **Cows**
  - As of Jan. 7, **919 dairy herds (up from 695 on Dec. 3) in 16 states (now including Nevada as of Dec. 6) in U.S.** have been confirmed **to have had HPAI infections.**
  - **Nearly all of the new dairy outbreaks last month were in California**. Most were in the Central Valley area, but more recently, cases in southern California were identified. On Dec. 18, the governor of California proclaimed a State of Emergency to expedite response to the outbreak.

- **Cats**
  - **H5N1 detections** have occurred recently **in numerous wild cats as well as in domestic cats in California, Oregon, and Minnesota.**
  - **Raw pet food** from two separate companies has been linked to serious avian influenza illnesses in cats.
    - Per a warning from the Los Angeles County Department of Public Health, **Monarch Raw Pet Food was linked to avian influenza that sickened at least one cat in Los Angeles**. H5 bird flu virus was detected in samples of the food (which is made from **free-range**



instead, they issued a statement: "there is currently no credible evidence to suggest that our raw food products are linked to avian influenza."

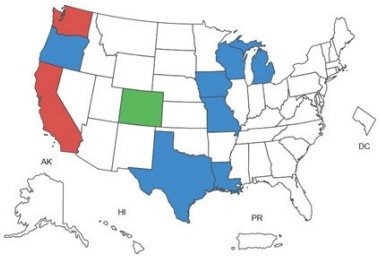
- Meanwhile, the **Oregon Department of Agriculture** reported that an indoor house cat died from H5N1 after eating **Northwest Naturals Feline Turkey Recipe raw frozen pet food**. The H5N1 sequence from the cat matched an H5N1 sequence obtained from a sample of the pet food. The company issued a voluntary recall for the pet food, which is sold in 12 states and in British Columbia.

- H5 bird flu was also confirmed in four cats in a separate household Los Angeles County that **consumed raw milk** purchased from a store, became ill, and died. While numerous barn cats at dairy farms have died from H5 bird flu, this is the *first case where indoor pet cats are known to have died from drinking raw milk*.
- **No human cases** have been linked **to exposure to infected cats** at this point.
- FDA released a document describing how to reduce the risk of HPAI in cats, focusing primarily on not feeding them raw meats or unpasteurized milk and preventing them from hunting and consuming wild birds.

- **Birds**
  - **Domestic birds**
    - Sporadic outbreaks of HPAI in U.S. domestic bird flocks continue.
    - **Both the B3.13 (the genotype associated with most dairy cow infections) and the D1.1 (the genotype found in** most infected wild birds **and several severe human illnesses)** have been found **in domestic poultry birds**.
    - **HPAI has recently been found in domestic poultry birds in several Wisconsin counties**, including Barron (Dec. 12), Kenosha (Dec. 18), and Burnett (Dec. 26).

  - **Wild birds**
    - CDC currently states that **H5 bird flu is widespread in wild birds worldwide**. Infected wild birds may show no signs of illness but can infect domestic poultry during migration.
    - Many recent reports have occurred in the U.S., **mostly in waterbirds and raptors.**
    - However, **songbirds and other birds found in the yard** do not usually carry H5 bird flu viruses, and currently there are no official recommendations to take down bird feeders unless you also keep domestic poultry.

HPAI in Humans

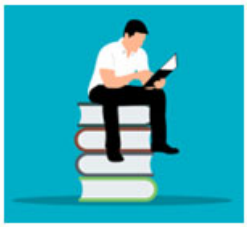


- As of Jan. 6, **66 people in at least 10 U.S. states have reported human cases of influenza A (H5)**.
  - Most cases occurred in California (37 cases, nearly all associated with dairy cattle exposure), Washington (with 11 cases all associated with poultry exposure), and Colorado (with 10 cases, with nine cases associated with poultry and one case associated with dairy cattle exposure).
  - Only two cases have had no known exposure to infected animals. Most cases were identified through **targeted surveillance**.
  - Wisconsin **and** Iowa **both reported their first human cases in December**, with both individuals having exposure to infected poultry.
- **The first severe case of HPAI A(H5N1) infection in a person in the U.S. has resulted in their death.**

- The individual, who lived in Louisiana and had

wild birds and poultry (i.e., not the B3.13 genotype circulating in dairy cows).

- H5N1 sequences from patient isolates were closely related to sequences from poultry on the patient's property. However, some of the isolates from the patient (but not those from poultry on the patient's property and other birds and poultry in Louisiana) showed **mutations in hemagglutinin**, which is important for viral binding to host cells. This suggests that **the virus may have developed these genetic changes during the course of the human infection.**
    - One of these mutations observed in isolates from the Louisiana patient was also observed in an isolate from the **Canadian teenager** who also had a severe case of HPAI A of the D1.1 genotype, as discussed in the December eNews. A case report of this Canadian patient, a 13-year-old girl **who has now recovered**, was recently published.
    - No person-to-person transmission appears to have occurred with either the Louisiana or the Canadian patients.



- Several other recent papers discuss human bird flu and related topics:
    - An article in New England Journal of Medicine discusses clinical case histories of 46 of the U.S. human H5N1 infections.
    - A report in Science discusses potential reasons why no human pandemic may have occurred yet.
    - A new paper in the Journal of Infectious Diseases highlights progress towards a human vaccine against H5N1.
    - FRI affiliate member (and director of the Wisconsin Veterinary Diagnostics Lab and kind reviewer of the HPAI portion of this newsletter each month) Keith Poulsen is quoted in this article discussing where we have come in the past year since the first cases of H5N1 in dairy cows occurred.

In other food safety news:

Both FDA **and** FSIS **are investigating new *Listeria monocytogenes* outbreaks**, and there has been speculation **that they are the same outbreak**. FDA posted a *L. monocytogenes* outbreak on Dec. 26 and reported a case count of 31, while FSIS lists a *L. monocytogenes* outbreak as of December 2024. Neither agency has linked the outbreak(s) to a food product at this time.

In December, FDA also posted a **new *E. coli* O145:H28 outbreak** that sickened eight people; the outbreak has ended with no food product linked to the outbreak.

The **multistate outbreak of *L. monocytogenes* linked to a ready-to-eat meat and poultry products** produced by Yu Shang Food, Inc., that was first reported in November **has claimed a second life**. The outbreak has now been associated with 19 cases (eight new cases since November) in eight states. Of the illnesses, 17 have been hospitalized and 11 have been associated with pregnancies. The two deaths were in infants (one in California and one in Tennessee). Whole genome sequencing demonstrated that the *L. monocytogenes* sequence found in a Yu Shang product and in environmental samples were closely related the outbreak strain. Yu Shang has issued an expanded product recall.

At least two holiday meals served to groups resulted in outbreaks in December:

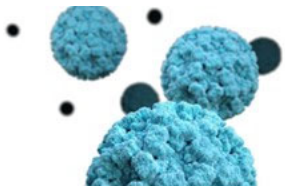
- At least 14 people in **Seattle** were sickened **by *Salmonella* after eating a Christmas dinner served at an emergency housing shelter**. Five people required hospitalization. According to one individual who ate the meal, "It was actually a really good meal to be honest… it was really bomb, until everybody started getting sick." The outbreak is still under investigation.
- **A holiday meal provided by United Airlines to its employees in December** sickened at least 24 people in Denver. The cause of the illnesses, which were

Government & Regulatory News

USDA FSIS released its review of the Boar's Head *Listeria monocytogenes* outbreak this week. The detailed report cited the manufacturing facility's **inadequate sanitation practices as "notable contributing factors"** and acknowledged that its review identified **several key areas for FSIS improvements** in its sampling, inspector training, and *Listeria* regulatory policy (see below for more on this).

A flurry of new and noteworthy regulatory changes, initiatives, and related documents have been announced by U.S. regulatory agencies in the past month:

- Following several notable outbreaks and recalls associated with ***L. monocytogenes* in ready-to-eat-meats** in recent months, FSIS has announced several new measures to protect the public:
  - **FSIS will now test for *Listeria* species beyond non-*L. monocytogenes*** in all sampling projects that currently test for *L. monocytogenes*. This will include product, food contact surface, and environmental testing. When products are positive for non-Lm *Listeria*, establishments must take corrective actions but will generally be allowed to move the product in commerce. For more details, read more here and here.
  - **FSIS is also soliciting nominations for membership to the National Advisory Committee on Microbiological Criteria for Foods** (NACMCF) until Feb. 18 and plans to appoint 30 committee members in 2025 whose work will include **review of FSIS's regulatory approach to *L. monocytogenes***. The 2025–2027 NACMCF is also anticipated to explore **food safety strategies for raw milk cheese**.
  - Additional changes involve **updated training and inspection requirements for FSIS inspectors and field supervisors**.
- FDA published numerous guidance documents recently:
- **A draft guidance on establishing sanitation programs for low-moisture, RTE foods,** including **corrective actions following a pathogen contamination event,** was released.
- FDA released **a final guidance on action levels for lead in baby and children's foods**.
- FDA released its long-awaited **updated definition for "healthy" claims for human food products.** To qualify as "healthy" under the updated definition, food products must contain a certain amount of a food from at least one of the food groups or subgroups outlined by the Dietary Guidelines for Americans including fruits, vegetables, protein foods, dairy, and grains. Foods that qualify for the "healthy" claim must also meet certain limits on saturated fat, sodium, and added sugars.
- An updated final guidance on **questions and answers regarding food allergen labeling** has also been released.
- A final guidance for FDA staff and interested parties was published for the assessment of the **public health importance of food allergens other than the "big nine."**
- A draft guidance on **labeling for plant-based alternatives to animal-based food products** was published.
- FAO/WHO released **a new microbiological risk assessment of viruses in food**. The document found the highest global public health burdens associated with **norovirus** and **hepatitis A** virus (in prepared foods, frozen berries, and shellfish), and **hepatitis E** (in pork and wild game).



Current Literature

The COVID-19 pandemic demonstrated that **wastewater-based surveillance (WBS)** could be used to gauge virus activity in a community. **Could WBS also be used for bacterial pathogens such as *Salmonella*?** Penn State researchers collected and tested wastewater

week period in June 2022, 42 *Salmonella* strains were isolated, with Panama, Senftenberg, and Baildon serotypes most prevalent. Sequencing of the Senftenberg isolates were genomic matches to strains associated with a **recent multistate *Salmonella* outbreak that was eventually linked to peanut butter**. Although no human cases in that area of Pennsylvania had been identified at the time of the outbreak, this study resulted in the identification of **three additional cases that had been reported to authorities but not recognized as part of the outbreak**.

A newly released preprint finds that **ten bacterial species comprise half of all published bacteriological literature**. The ten species most commonly studied included ***E. coli, Staphylococcus aureus,*** *Pseudomonas aeruginosa, Mycobacterium tuberculosis, Helicobacter pylori, Bacillus subtilis, Klebsiella pneumoniae, Streptococcus pneumoniae,* ***Listeria monocytogenes****,* and *Haemophilus influenzae* (***Salmonella enterica*** just missed the top ten list at position 11). The study found that **nearly three-quarters of known bacterial species remain unstudied**.

Can artificial intelligence (AI) be harnessed to enhance food safety? Two recent papers tried to use AI retrospectively to examine the largest food recall ever in the European Union (EU). This recall was triggered in September 2020, when Belgian regulators announced they had found exceptionally **high levels of ethylene oxide (EO) in sesame seeds imported from India.** EO is used to in control of insects and microorganisms in spices, although such use is prohibited for spices sold in the European Union (but not in the U.S). because of concerns related to its toxicity.

- Using a **commercially available AI platform**, the researchers in the first case study examined thousands of pieces of information to identify **global recalls and alerts** in the food and feed sector and uncovered hints as early as 2018 that EO was being found in black pepper imported from India. **An inverse relationship between the recalls and alerts associated with EO in sesame seeds and findings of microbial pathogens such as *Salmonella*** in sesame seeds was also identified as a consequence of the recall.
- The second report also used **international food safety alerts as an approach to strengthen border control of products (EO-contaminated sesame seeds) entering Taiwan**. Using an unsupervised learning algorithm (K-means clustering) commonly used in data mining, the researchers **grouped manufacturers** ("birds of a feather flock together") to identify those **most likely to produce EO-contaminated products. Products from these companies would thus merit priority inspections at border**s, reducing the overall amount of traditional sampling required while still maintaining food safety.

A new review provides **an overview of rapid detection methods for *Salmonella*,** including immunological, nucleic-acid based, CRISPR/Cas9-based methods, Raman spectroscopy, and biosensor technology.

In bacteria, the **RecA protein is essential for DNA recombination and repair and also the organism's response and adaptation to environmental stress**. A new study investigated the effects of **deletion of the recA gene on *Cronobacter sakazakii,*** a foodborne pathogen often associated with infant formula that can cause serious disease in infants. The *recA* knockout mutant grew less well, was less tolerant to desiccation, and was less able to form biofilms compared to the wild-type strain. I**n a rat model, the mutant strain showed significantly reduced virulence compared to the wild-type strain**. **Strategies that inhibit the RecA protein might therefore be useful in mitigating *C. sakazakii* infections and also in reducing the pathogen's presence in manufacturing environments and in foods**.

Other News

Abstracts for IAFP 2025 are due Tuesday, Jan. 14, 2025.

Students around the world enrolled full-time in a food safety program (graduate and undergraduate) are encouraged to apply for the **IAFP Student Travel Scholarship,** sponsored by

outstanding opportunity to receive travel expenses to join more than 3,500 food safety professionals at **IAFP 2025** in Cleveland, Ohio. The electronic application deadline is **Tuesday, Jan. 21, 2025.** Go here to learn more and to apply.

Applications are being accepted until Feb. 28 for the $3,000 **AOAC International/Eurofins Foundation "Testing for Life" student award**. Eligible students include **full-time undergraduate or graduate students** who are advancing basic or applied science in analytical or molecular testing for food safety, food security, food defense, food authenticity, or health and environmental protection.

Several free upcoming webinars will discuss food safety culture:

- IAFP is hosting "Assess Food Safety Culture: Choosing Methods and Maximizing Results," webinar on Feb. 18 at 11 a.m. ET. Registration is free; advance registration is required. Go here for more information.
- FDA and Stop Foodborne Diseases are co-hosting a series of seven food safety culture webinars starting on Jan. 29.

UW-Madison and Wisconsin News

Upcoming training opportunities on the UW-Madison campus include the following:

- Meat Curing School (Jan. 21–23; currently waitlisted)
- Meat Snacks Short Course (Feb. 25–27)
- Basic Harvest and Fabrication Workshop (March 25-27)
- Cheesemaking Fundamentals (March 11–12, 2025)
- Confectionary Technology Course ("Candy School") (July 21–Aug. 1, 2025)

Did someone forward this newsletter to you? Click here to sign up to receive future FRI e-newsletters!

Website LinkedIn Facebook Instagram