

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

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FRI News



Work by FRI's **Applied Food Safety Lab researchers** (pictured left at IAFP last year) for Kerry Food Production & Preservation was **recently featured** in the company's newsletter and website. The work demonstrated that a **buffered vinegar/cultured dextrose ingredient was as effective as 156 ppm sodium nitrite**

plus 3.8% potassium lactate/sodium diacetate in prevent *Listeria monocytogenes* growth in a low-sodium turkey product during 14 weeks of storage at 4°C.

FRI executive committee member **Jeri Barak** recently assumed the role of **Associate Dean for Academic Affairs for the University of Wisconsin-Madison's College of Agricultural and Life Sciences**. You can read about her vision for the college's educational efforts [here](#).



FRI 2024 Schreiber Foods Scholarship recipient **Justin Eagan** (in FRI executive committee member **Nancy Keller's** lab) was lead author [on a new publication](#) together

with **FRI Summer Scholars Evan Digman** and **Martijn den Boon**, that identified a potential biocontrol agent against the **post-harvest apple pathogen *Penicillium expansum***. *P. expansum* produces the **mycotoxin patulin**. Patulin is also known to have antimicrobial activity, so does patulin production give *P. expansum* a fitness advantage in the apple microbiome that could be taken away by competitor microbes? To address this question, Eagan and colleagues collected apples from Wisconsin orchards and isolated their microbiota. In culture, isolates of *Hanseniaspora* (found in these microbiota) together with a *Gluconobacter* isolate significantly reduced *P. expansum* biomass and suppressed patulin accumulation. The *Hanseniaspora* isolate (identified by sequencing as *H. uvarum*) also reduced *P. expansum*-mediated apple disease on apples with surface wounds with trends towards lower patulin levels. Other *H. uvarum* strains were shown to reduce both *P. expansum* and *Botrytis cinerea* disease on apples, hinting that *H. uvarum* may have a more generalized ability to inhibit fungal-mediated apple diseases.

FRESH seminars will resume in March! **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 full for **FRI's Better Process Cheese School** in Madison, Wisc., March 25–26, **but a waitlist is available**.

[Registration is open](#) for the **IAFP Challenge Study Workshop**, to be held April 2–3 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.



Moisture Foods, to be held April 29–30 in Arden Hills, Minn.

Save the date (May 20–21) 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 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

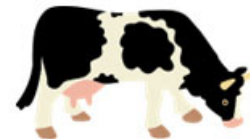
A pre-print from Cornell University researchers examined how **thermization (a lower temperature alternative to pasteurization) affects HPAI H5N1 viability in milk**. The study found that the virus was inactivated at temperatures above 60°C (140°F) held for five seconds. At 50°C (122°F) for 10 minutes, only partial reduction of the virus was observed. The study also found that the virus can survive in raw milk stored at 4°C for up to eight weeks but is inactivated faster at higher temperatures, with only two days required for inactivation in milk held at 37°C. Such inactivation methods could **reduce the risk of environmental contamination when disposing of milk** from infected cows.

A new report from California describes that **H5N1 can be inactivated in raw whole milk following acidification with citric acid to a pH of 4.1-4.2 for six hours**. This strategy appears to represent an alternative to heat treatment for the disposal of non-saleable milk.

HPAI in Animals

• Cows

- As of Feb. 3, **35 new herds** have been confirmed to have HPAI infections (H5N1). Most of the recently reported infected herds were again California (31 herds), except four herds in Nevada.



• Birds

- Wild birds and domestic bird flocks across the U.S. continue to have HPAI infections. In the last 30 days, 82 commercial and 42 backyard flocks have had confirmed HPAI infections.
- HPAI (H5N9) has been confirmed in a commercial duck facility in Merced County, Calif. This is the **first time that this strain of HPAI has been found in U.S poultry**. While H5N9 does not make ducks as sick as H5N1, the mildness of the disease means that ducks with H5N9 may be ideal hosts in which new reassortment viruses can form and subsequently spread.
- **Avian influenza is behind recent egg shortages and jumps in egg prices**, as discussed by UW Madison-Extension poultry specialist Ron Kean.



• Monkey studies

- An accelerated article preview published on Jan. 15 from NIAID virologists describes illnesses caused by exposure of cynomolgus macaques to H5N1 (the strain that has been circulating in dairy cows) by various routes. Both **nasal and intratracheal exposures to the virus resulted in systemic infection** and pneumonia, with intratracheal causing more severe pneumonia. In contrast, when **exposed via the mouth or stomach, monkeys experienced limited infections** with oral and some nasal shedding, but with no signs of illness.
- Another study led by NIAID researchers and others demonstrated that **prophylactic exposure of cynomolgus macaques to broadly neutralizing**

potential for such antibodies to be an effective influenza pandemic countermeasure.

- **Humans**

- **At least one new human case has been confirmed in the U.S.** since Jan. 5. The exposure source for this case, which occurred in California, is unknown.
- In mid-January and following the [recent report](#) of the first H5 bird flu death in the U.S., CDC [recommended](#) accelerated subtyping of patients hospitalized with influenza A. The ability to quickly distinguish between seasonal influenza A and avian influenza (H5N1) would expedite optimal care, infection control, and case investigation for those with avian influenza infections.



In other food safety news:

Only one new foodborne outbreak investigation [was reported](#) by FDA in January. A ***Listeria monocytogenes* outbreak**, which is **not yet linked to a food product, has sickened at least 34 people**. This outbreak is in addition to [another *L. monocytogenes* outbreak](#) of unknown origin that FDA first reported on Dec. 26, which has a current case count of 32 (up from 31 last month). Since December, USDA FSIS [has also been investigating](#) a *L. monocytogenes* outbreak with no known cause. No information about these outbreaks is currently on the [CDC webpage for active *Listeria* outbreaks](#), and no additional information about these outbreaks is currently available.

In Canada, an outbreak of *Salmonella* (serovar not yet reported) associated with imported pastries has sickened 69 people in five provinces. No deaths have been reported, but 22 individuals have required hospitalization. The pastries [were distributed](#) to grocery stores, bakeries, hotels, retirement residences and were sometimes sold at catering events. The pastries recalled have included Sweet Cream brand Mini Patisserie and D. Effe T. brand Lemon Delight (from Italy) and Tartlet with Forest Fruits and appear to have been produced by the same company in Italy.



A large outbreak of the **neurological disorder Guillain-Barre (GB) syndrome in India** [appears to be linked](#) to a ***Campylobacter* spp. infections**. At least 73 people have been diagnosed with GB syndrome, which is caused by an inappropriate immune response to viral or bacterial infection that attacks peripheral nerves, leading to such as weakness, tingling, muscle weakness, and paralysis. The condition, despite severe symptoms, is treatable.

Government & Regulatory News

The incoming Trump administration in the U.S. has proposed and is initiating changes that may affect food safety and security, prompting current uncertainties regarding health-related [research funding](#), policies, leadership, and priorities; [communications from federal health-related agencies](#); regulatory agency initiatives, enforcement, and [oversight](#); and [agricultural and food industry policies, positions, economics, and workers](#). Stay tuned.

FDA [will now require](#) that **cat and dog food manufacturers to consider H5N1 as a known or reasonably foreseeable hazard** in their food safety plans.



[A new EFSA document](#) on activities related to **emerging food safety risks** discusses several potential hazards that are new and should be investigated further. Some of those listed include the following:

- **Z15: an engineered nanomaterial** made of iron oxide and folic acid; used in

could potentially enter feed and food, with unclear exposures and toxicological potentials.

- **Alcohol replacement drinks** that contain food-grade herbs (or [their chemical components](#)) that are active on the GABA system: More information is needed.
- Emerging zoonotic viruses such as **Hendra and Nipah viruses**.



FDA revoked the authorizations for the use of red dye 3 in foods and ingested drugs. For more information on this decision, [listen to this podcast](#) or [follow the links that Food Safety Magazine compiled](#).

Was the red dye 3 ban by FDA motivated (at least in part) due to individual state bans on the colorant, and if so, what are the implications of this for food ingredients? You can read more [here](#).

FDA announced [a new prevention strategy](#) aimed at combating the **contamination of fresh and frozen berries with enteric viruses**, such as hepatitis A virus and norovirus. This strategy outlines a series of actions designed to enhance communication, implement consistent prevention measures globally, and fill significant research gaps in the detection and management of these enteric viruses.



Current Literature



[A new report](#) examined the **growth of *S. aureus* during slow cooking of beef and turkey formulations over an extended time period alone or in the presence of vinegar or lactate diacetate**. Without added antimicrobials, *S. aureus* grew less than 2 log when cooking from 10 to 54.4°C over 9.3 hours. **Vinegar minimized *S. aureus* growth**, but lactate diacetate was not effective due to the higher pH of the meat. **Beef formulations, which had a lower pH (6.4)**

than turkey formulations (6.7) also showed less growth. Based on these data, existing growth models for these processes without antimicrobials were fail-safe but possibly too conservative, according to the authors.

Diet (and life-style)-driven modulation of the microbiome to elicit health benefits requires knowledge of how food consumption alters the microbiome. **Several new studies illustrate progress in this area.**

- **Coffee consumption was highly correlated** to the presence or abundance of the species *Lawsonibacter asaccharolyticus*, with the relationship observed across many people representing different populations. *In vitro* experiments showed that the addition of coffee stimulates the growth of this organism, even at levels that inhibit certain commensal organisms. *L. asaccharolyticus* is a **butyrate-producing anaerobe** that was only recently identified (2018) but [has also been shown](#) to be enriched in the human gut microbiome following **aronia berry consumption**. Both **aronia berries and coffee are rich in chlorogenic acid, caffeic acid, and polyphenols whose metabolites may influence microbiome changes and may explain some of the health benefits associated with these foods**.
- As highlighted in [a recent systematic review and meta-analysis](#), **levels of the non-essential amino acid taurine are increased in serum, urine, and tissue samples of individuals with colorectal cancer (CRC)**; in fact, taurine levels have been proposed as a sensitive, specific, and non-invasive screening assessment for CRC. **Rates of CRC in young adults have increased in recent years**, and **taurine is often added to energy drinks that are popular with this demographic**. Furthermore, taurine is used preferentially as an energy source for **hydrogen sulfide-producing bacteria, and high levels of such bacteria in the gut are associated with CRC**. A clinical study [is underway now](#) to assess



your oral and gut microbiome? [A new report](#) found mice with oral exposure to chlorhexidine (a component of some mouthwashes that treat gum disease) had 75% fewer viable mouth bacteria as well as **reduced species richness in their gut microbiome**. Chlorhexidine-exposed mice also demonstrated **reduced weight gain, body fat, and had plasma insulin levels without a change in caloric intake** compared to control mice, suggesting chlorhexidine reduced nutrient absorption. In humans, the use of **chlorhexidine mouthwash can increase blood pressure** (by alterations in the nitrate-nitrite-NO pathway), and long-term use is associated with **increased risk for systemic disease**.



Chronic wasting disease (CWD) transmission to humans has never been reported, despite the human consumption of thousands of CWD-infected animals each year. Is this because CWD-prions don't affect human prion proteins, or maybe because cooking inactivates the prions? [A study from CDC](#) confirmed the presence of CWD prions in muscles from infected elk using a prion protein misfolding cyclic amplification technique. Exposure to high temperatures during cooking increased the availability of prions for amplification in vitro, suggesting prion activity was not lost. However, samples of the raw or cooked meats could not induce the misfolding of a **human prion protein**, suggesting **limited zoonotic transmission potential**.



Living where there are a lot of cattle and other domestic ruminants greatly increases the incidence of infections by O157 and non-O157 Shiga-toxin producing E. coli. Is this extra risk due to direct animal contact or something else? [A new open-access report](#) examined relationships between **STEC infection rates and cattle, swine, goat, and sheep animal densities in Minnesota**. Recent direct contact with a ruminant significantly increased the risk of STEC infection in both summer and winter (by ~5-9 fold). However, the **density of nearby animals also affected STEC incidence, independently of direct contact**, suggesting that an indirect factor is also at work.



Other News

Three free webinars on food safety topics will be held in the coming weeks:

- AMSA and the Meat Institute are hosting a [free webinar](#) featuring Katie Rose McCullough, Jessie Vipham, and Daniel Unruh on the **latest food safety developments related to *Listeria monocytogenes* and *Salmonella*** on Feb. 19 at 12:00 PM CST.
- The Meat Institute is hosting a free webinar, titled "**Validation Study Considerations: Thermal Processing, Dried and Fermented Products**" on Thursday, Feb. 13 at 2 p.m. ET for members to discuss regulatory requirements associated with safe production of products such as summer sausage, pepperoni, salami, and country-cured ham.
- IEH is hosting **Introduction to the Food Code**, by Craig Wilson on Feb. 27 at 11 a.m. PST. The webinar is planned to include practical examples to provide an understanding of how to apply these standards and proactively address potential safety challenges.



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

UW-Madison and Wisconsin News

The **Wisconsin Association of Food Protection is seeking volunteers** to help in their mission to advance food quality and leadership in food safety training and education for Wisconsin food manufacturers. Committees with current openings include scholarship and membership committees. Interested individuals should email WAFP at admin@wifoodprotection.org.



The Perlman Symposium, an annual event showcasing **UW-Madison research related to antimicrobials and antibiotics**, will be held on Friday, April 25. The event is held in memory of **David Perlman**, dean of the UW-Madison School of Pharmacy from 1968–1975. Registration for this free symposium [is now open](#).

Bob Cassens, a distinguished **professor of Meat and Animal Science at UW-Madison** for many years who was a meat science expert **whose research impacted key USDA regulatory decisions related to the use of nitrite in cured meats**, among many other accomplishments, [has passed away](#).



The Badger Meat Science Club [is back](#) after several years on hiatus. This student organization, organized by several MSABD graduate students, hopes to foster community and develop student interest in meat science and is open to undergraduate and graduate students of all majors.

Luisa Cervantes Barragan (Emory University) [will present](#) “**Diet-microbiome interactions that shape the intestinal T cell response**” on Friday, Feb. 7 at noon in room 1520 Microbial Sciences Building.

Sue Ishaq (University of Maine) [will present](#) “Place and time matter for gut microbes making anti-inflammatories from broccoli sprouts” on Thursday, Feb. 20 at 3:30 pm in Ebling Auditorium in the Microbial Sciences Building.

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

- [Meat Snacks Short Course](#) (Feb. 25–27)
- [Basic Harvest and Fabrication Workshop](#) (March 25–27)
- [Cheesemaking Fundamentals](#) (March 11–12 and May 6–7)
- [Cheesemaking Fundamentals in Spanish](#) (online starting March 18)
- [Cheese Grading and Evaluation](#) (March 18–20)
- [Advanced Cheesemaking: American Varieties](#) (April 29–May 1)
- [Confectionary Technology Course](#) (“Candy School”) (July 21–Aug. 1, 2025)

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