

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

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Food Safety News



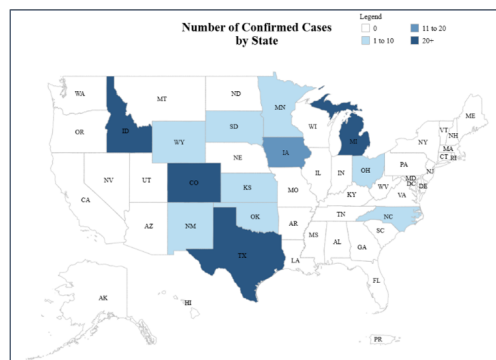
Highly pathogenic avian influenza (HPAI) H5N1 clade 2.3.4.4b genotype B3.13 in cows and milk continues to be an important topic in the news.

What is the current status of the outbreak in dairy herds?

- As of June 26, **172 dairy herds** (up from 129 on June 26) in **13 states** (up from 12, now including **Oklahoma**)

have had confirmed infections with HPAI.

- No HPAI cases in dairy or other cattle have been reported in **Canada** or other countries as of July 18.
- As of July 16, no Canadian commercial milk samples (of 911 tested) have tested positive for HPAI viral fragments.



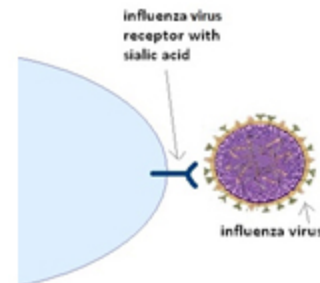
What has been learned about HPAI infections in cows and other animals?

- Colorado has now had HPAI outbreaks in 49 herds (representing a large percentage of the state's 105 licensed dairy facilities). The state has now issued a **mandatory order for weekly bulk tank testing for HPAI**.
- UW-Madison researchers (including FRI affiliate member **Keith Poulsen**), in collaboration with scientists in Kansas, Texas, and Japan) released results from a new study investigating **transmission and pathogenicity of the bovine H5N1 virus in mice and ferrets**. Among the main conclusions:

- The bovine virus can be transmitted to mice by **oral consumption** of small amounts of milk from an infected cow or by intranasal (respiratory exposure) to the virus.



- **The bovine H5N1 virus can bind sialic acid residues found in both human and avian receptor proteins**, unlike other H5N1 viruses that show specificity for the sialic acid residues found in avian receptor proteins.



- **Mammal-to-mammal transmission for bovine H5N1 is possible but appears inefficient:**
 - The bovine virus was transmitted from lactating mice to pups but demonstrated only limited ability to be transmitted through respiratory droplets in ferrets (consistent with a new CDC study).
 - The current virus thus would likely require mutations in order for it to spread as easily as seasonal influenza viruses do between humans.

What about HPAI in humans?

- As of July 25, **nine farm workers** at two **poultry farms** in Colorado have tested positive for HPAI A (H5).
 - The workers tested positive after working directly with infected chickens at a commercial egg farm.
 - The genotype of the H5N1 identified at least one of the farms matches the B3.13 genotype that is infecting dairy cows, suggesting that **spillover from cows led to the poultry flock infection**.
 - Extreme heat has been reported to have prevented the use of **personal protective equipment** in at least some of the workers at the time they were likely infected.
- Including the new Colorado cases, **at least 13 people in the U.S. have been infected with influenza A (H5) this year**.
 - **All cases were in individuals who had significant contact with H5N1-infected animals**. Four of these cases happened after exposure to infected dairy cows, while nine occurred after exposure to poultry.
 - **Those people infected experienced similar, mild symptoms** (unlike the >50% fatality rate observed in the relatively rare human infections by other H5N1 lineages).
 - **No evidence of person-to-person transmission has been reported**.
- **Neutralizing antibodies were not detected** in blood samples from **35 Michigan dairy workers** who worked with H5N1-infected cows (many without wearing masks or goggles).



What about HPAI in foods? Anything new?

- The results of a new study align with early studies indicating that **pasteurized milk dairy products in the U.S. are safe to consume**. The study tested 297 samples (collected by FDA in April) that represented 23 different types of pasteurized dairy products from 17 states (and representing products produced in 38 states). While ~20% of samples contained viral RNA fragments, **none of the samples contained infectious virus**.
- A Canadian study using spiked milk has confirmed results of earlier studies suggesting that **milk pasteurization is effective at**



samples pasteurized at 72°C for 15 seconds, complete inactivation occurred in seven of eight samples, with the viral titers in the remaining sample reduced by at least 4.56 log (higher by ~1 log than the levels detected in bulk milk tanks in affected areas).

- In another new study, **cooking ground beef (20% fat) patties** that were inoculated with a **low pathogenic avian influenza virus** (at 5.6 log 50% egg infectious doses per patty [EID₅₀]) on a gas grill to **an internal temperature of 145 or 160°F reduced viable virus to nondetectable levels**. Cooking to 120°F reduced virus by at ~2.5 log EID₅₀. The authors note that the thermal stability of avian influenza viruses are similar across different viral pathotypes, suggesting that these data should also be valid for HPAI viruses such as the bovine H5N1 virus.



Other U.S outbreaks and food safety warnings have been in the news, including the following:



Boar's Head brand liverwurst has been linked to a *Listeria monocytogenes* outbreak that has sickened 34 people from 13 states, with 33 hospitalizations and two deaths reported. The first illness reported began on May 29, 2024. CDC investigation found that people in the outbreak were significantly more likely to eat liverwurst, with seven specifically reporting Boar's Head brand. The outbreak strain was found in an unopened Boar's Head liverwurst product obtained from a retail store in Maryland. Boar's Head expanded its recall beyond liverwurst to include other ready-to-eat (RTE) deli meats produced on the same day and facility as the liverwurst. On July 30, the recall was further expanded to include 71 products produced at a Virginia plant between May 10, 2024, and July 29, 2024 under the

Boar's Head and Old Country brand names. Because these products were made recently, many are still within their shelf life and could cause more illnesses. **This massive recall encompasses more than 7 million pounds of RTE meat and poultry products**, including meat intended for slicing at retail delis as well as some packaged meat and poultry products sold at retail locations. However, this recall is not as big as the **Sara Lee recall of deli meats in 1998** in which 35 million pounds were recalled due to an associated *Listeria* outbreak that resulted in 15 deaths and six miscarriages.



An ***E. coli* O157:H7 outbreak in Flathead County, Mont.** resulted in one death and 14 illnesses in July. Local and state investigators linked **ground beef made from wagyu beef** to the outbreak. All of those sickened in the outbreak reported eating **undercooked or made-to-order burgers** made with wagyu beef (from Lower Valley Processing Company, which has issued a product recall) at one of several restaurants in Flathead County.

FDA is investigating several recent outbreaks for which **food sources have not yet been identified**:

- A ***Salmonella* Irumu** outbreak, first reported on July 10, has sickened at least 32 people.
- An **ongoing *Salmonella* Typhimurium** outbreak has sickened at least 87 people.

Updates on two U.S. outbreaks reported here last month have been announced:

- The simultaneous and geographically related ***Salmonella* Africana** and ***Salmonella* Braenderup** outbreaks were consolidated by CDC and FDA, with **both outbreaks linked to cucumbers from Bedner Growers, Inc.**, of Boynton Beach, Fla. (although FDA has stated that this grower does not account for all of the illnesses). As of July 1, **449 illnesses have been attributed to the outbreak strains**. The *S. Braenderup* strain causing the illnesses matched a strain found in **untreated canal water** used by Bedner Growers. **Additional *Salmonella* isolates were collected from soil and water samples** at Bedner Growers and are still being investigated.
- Despite a large recall, some retailers are continuing to sell the **Diamond Shruumz-brand products (microdosing chocolate bars, infused cones, and micro- and macro-dose gummies)** that have been linked to a variety of severe symptoms including **seizures, central nervous system depression, agitation, abnormal heart rates, hyper/hypotension, nausea, and vomiting**. As of July 30, **78 individuals have been reportedly sickened, with 65 hospitalizations and two possible deaths** associated with consumption of these products. The exact cause of the outbreak is still under investigation.



FRI News



FRI was well represented at the 2024 IAFP Annual Meeting! Congratulations to undergraduates **Jakob Gryniewski** (who received a **2024 Student Travel Award**, **Calvin Slaughter** (who received **first place in undergraduate research poster competition** and received a **travel award generously sponsored by Gale Prince**). Jacob and Calvin both work in the FRI Applied Food Safety Lab under the direction of **Kristin Schill**. **Jessica Brown**, a graduate student in FRI



affiliate member **Steve Ricke's** lab, received **first place for her graduate technical presentation** and also received a **travel award** from the **Wisconsin Association For Food Protection**). And last but not least, **FRI associate director Kathy Glass** was honored for her decades of outstanding contributions to food safety by receiving IAFP's prestigious **Harry Haverland**





FRI's 2024 Undergraduate Summer Scholar program, led by FRI outreach coordinator **Adam Borger**, had another successful year. The nine participants enjoyed field trips to numerous food companies in southern Wisconsin (including **New Glarus Brewing Company** and **Kikkoman**, as shown in the accompanying photos) while also presenting their summer research project

results in a symposium on July 26.



A few spots remain for the biennial **Food Safety and Meat Microbiology School**, which will be held Aug. 13–15. The short course, **co-led by FRI and the Meat Science & Animal Biologics Discovery program**, will include practical information on microbiology, sanitation programs, facility design, thermal processing, and ingredients/new technologies. Several hands-on and small group microbiology lab exercises and interactive demonstrations are also scheduled. For more information, see [here](#).

Government & Regulatory News

USDA FSIS issued [a new proposed rule](#) that would establish final product standards to prevent raw poultry products from containing **any type of *Salmonella* at or above 10 CFU per gram** (or mL) from entering commerce. In addition, the product standards would prevent the presence of **any detectable levels of *Salmonella* serotypes with public health significance** (defined as Enteritidis, Typhimurium, and I,4,[5],12:I for raw chicken and Hadar, Typhimurium, and Muenchen for raw turkey). The public comment period will be open for 60 days starting July 29.



FDA launched [a new webpage](#) on **micro- and nano-plastics in foods**, containing summaries and links to additional information on health effects, scientific information (such as analytical methods), and regulatory information.



FDA [released results](#) of a sampling assignment to **estimate the prevalence of *Cyclospora cayetanensis*, *Salmonella* spp., and Shiga toxin-producing *Escherichia coli* (STEC)** in cilantro, parsley, and basil as part of FDA's ongoing effort to help proactively ensure food safety. From samples collected between September 2017 to September 2021, **FDA detected *Salmonella* spp. in 17 out of 1,358 samples, detected *C. cayetanensis* in 18 out of 812 samples, and detected**

STEC in 1 out of 1,350 samples. Basil samples demonstrated the highest prevalence of both *C. cayetanensis* (9.2%) and *Salmonella* (2.8%).

Current Literature

provides a **comprehensive discussion of the predominant bacteria and viruses associated with seafood products**, summarizing outbreaks, prevalence of microbial pathogens, interventions, research gaps, and areas for future work.



A new study investigated the **microbiome of hydroponics farms**, tested how **resident biofilm-forming bacteria affect *Salmonella* colonization of hydroponics systems**, and explored **different chemical sanitation methods** on sanitation efficacy as well as the yield and chemical safety of indoor-grown agricultural products under different sanitation methods.

A recent publication consolidated extensive data on **temperatures of household refrigerators in 16 European countries** to identify **a realistic temperature to use in challenge studies and for shelf-life validation or verification for refrigerated RTE foods**.

The study concluded that **10°C** should be used as the reference temperature to simulate reasonably foreseen storage conditions in European domestic refrigerators.

Raw flour has been associated with outbreaks of ***Salmonella*** and **STEC** in the U.S. and Europe, which has led to studies that have investigated the microbial quality of flour and products containing raw flour in the U.S. and Europe. A new study adds to this literature by sampling and testing flours (from grains or legumes) collected from retailers, restaurants, and manufacturers across England. Of 882 samples tested, one sample (a wheat product that also contained dried egg and dried milk) contained ***Salmonella*** (serovar Newport). Ten samples (1.1%) had presumptive positive results for STEC. The authors concluded that while **the microbiological quality of most flours was satisfactory, consumer awareness to highlight the potential of infection from a small proportion of flours was important**.



A recent review article discusses ***Staphylococcus aureus* in the dairy industry**, covering information related to **enterotoxin production, biofilm production, and how lactic acid bacteria or its metabolites can be harnessed to control *S. aureus* in dairy foods**.



***Cronobacter sakazakii* contamination of powdered infant formula** and its presence in infant formula **manufacturing facilities** has been in the news in recent years: Not only can this opportunistic pathogen cause morbidity and mortality in **infants**, but trying to eliminate it from manufacturing environments can seriously **disrupt powdered infant formula supplies**. A new microbiological survey investigated the presence of this organism in **U.S. households** (n=263) and in retail foods

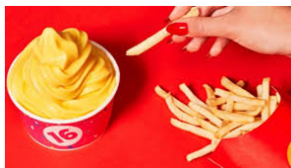
(n=4009). ***Cronobacter sakazaki* was isolated in 24.7% of U.S. homes**, with higher recovery rates on floors and kitchen surfaces. The dominant strain identified was ***C. sakazakii* ST4**, the type most often associated with neonatal meningitis. **High frequencies**

to *C. sakazakii* contamination of powdered infant formula.

Other News

The calendar may say that we are now halfway through summer, but **new summer taste combinations** are still being introduced:

Ore-Ida and GoodPop teamed together to recreate the flavor of **French fries dipped into a milkshake** with their [Fudge n' Vanilla French Fry Pops](#).



Not to be outdone, national frozen dessert brand 16 Handles [has launched](#) a limited-edition **frozen yogurt that contains real potato French fry pieces**.



Of course, this month's **Wisconsin State Fair** is a well-known venue for **strange summer food mashups**. Among the [~100 food novelties](#) that are being introduced there this summer are [Cheesy Sriracha Funnel Cake Bites](#) and [Frozen Pickle Lemonade](#).



UW-Madison and Wisconsin News



The **Wisconsin Association for Food Protection** is offering a **HTST Pasteurizer Training Course** on Sept. 4 at the Sargento Training Center in Plymouth, Wisc. You can register [here](#).

Read the Summer 2024 edition of the **UW-Madison Meat Science & Animal Biologics Discovery** newsletter [here](#).



**WISCONSIN
ANIMAL & MEAT INDUSTRY
COALITION CONFERENCE**

"A Unified Voice for the Wisconsin Animal & Meat Industries"

October 17 – 18, 2024
The Pyle Center, Madison, WI

Join us to hear from industry leaders about applicable and relevant topics impacting your business, including environmental, safety and labor issues, understanding your customer, product innovation, and supply chain challenges.

Thursday evening, we will celebrate the past year's successes and accomplishments of Wisconsin's meat industry, culminating with the Wisconsin Meat Industry Hall of Fame induction ceremony!

Look for conference and registration details in future communications



Registration is now open for the 38th annual **Kenneth B. Raper Symposium** (Sept. 3 in the Microbial Sciences Bldg. on the UW-Madison campus), which highlights **microbiology research at UW-Madison** and nearby institutions.



The **2024 Wisconsin Science Festival**, to be held Oct. 14–20, will focus on **agriculture** this year. You can **find out how you can share your science** at the festival by going to [this website](#).

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

- **Food Safety and Meat Microbiology School** (Aug. 13–15), hosted by FRI and the Meat Science & Animal Biologics Discovery (MSABD) program; **registration is now open.**
- **World of Cheese from Pasture to Plate** (Aug. 27–30); hosted by the Center for Dairy Research
- **Wisconsin Meat Processing School** (Sept. 17–19); hosted by MSABD
- **New Technologies Short Course: Thermal Processing** (October 22–24); hosted by MSABD



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