

# NORTHEAST OHIO AGRI-CULTURE NEWSLETTER

Your Weekly Agriculture Update for  
Ashtabula and Trumbull Counties

April 30, 2024



*Planting has started for the 2024 season!*

## **In This Issue:**

- Questions and Answers Regarding Milk Safety During Highly Pathogenic Avian Influenza (HPAI) Outbreaks
- Governor DeWine Announces Statewide Open Enrollment for H2Ohio Agricultural Incentive Program
- New report Looks at Ohio Agricultural Land Lost to Development
- Same 'ol Farm Drainage Research? No, Think Future
- Change in Ohio Law Creates New "Low Risk" License for Mobile Food Vendors
- Genetic Hope in Fight Against Devastating Wheat Disease

## ***Hello Northeast Ohio Counties!***

It's been a busy few days across the region! Our soils quickly dried out and warmed up allowing a lot of field work to take place over the last several days. Both corn and soybeans are in the ground in many areas, but total number of acres planted remain small. With warm and dry weather for the rest of week conditions will continue to be favorable for field work.

Insect and slug trapping is continuing in Trumbull County. No black cutworm was detected, but true armyworm were trapped in two locations.

Have a great week and be safe!

**Lee Beers**  
Trumbull County  
Extension Educator

# Questions and Answers Regarding Milk Safety During Highly Pathogenic Avian Influenza (HPAI) Outbreaks

Source: <https://www.fda.gov/food/milk-guidance-documents-regulatory-information/questions-and-answers-regarding-milk-safety-during-highly-pathogenic-avian-influenza-hpai-outbreaks>

## What is HPAI and why is it a problem?

Highly Pathogenic Avian Influenza (HPAI) is a disease of poultry that is highly contagious and often deadly in poultry, caused by highly pathogenic avian influenza A (5) and A (7) viruses; it is also known as bird or avian flu. HPAI viruses can be transmitted by wild birds to domestic poultry and other bird and animal species. Although bird flu viruses do not normally infect humans, sporadic human infections have occurred. It is important to note that “highly pathogenic” refers to severe impact in birds, not necessarily in humans.

## Milk Safety and Supply

### Is the milk available in the retail market safe to drink?

The FDA and USDA have indicated that based on the information we currently have, ***our commercial milk supply is safe*** because of both the pasteurization process and that milk from sick cows is being diverted or destroyed. The federal-state milk safety system, and the Grade “A” Pasteurized Milk Ordinance, have proven effective for decades against a wide range of pathogens. Data from previous studies shows that pasteurization is very likely to effectively inactivate heat-sensitive viruses in fluid milk. Furthermore, thermal inactivation of HPAI has been successful during the pasteurization process for eggs, which occurs at lower temperatures than what is used for fluid milk. Given this is a novel and evolving situation, the FDA and USDA are working closely to collect and evaluate additional data and information specific to HPAI A (H5N1) to support our state co-regulators as they manage this emerging disease in dairy cattle.

U.S. government partners are working with all deliberate speed on a wide range of studies looking at milk along all stages of production, including on the farm, during processing and on shelves. This work is a top priority and we are proceeding in an efficient, stepwise and scientific fashion to ensure the continued effectiveness of the federal-state milk safety system and reinforce our current assessment that the commercial milk supply is safe. These important efforts are ongoing and we are committed to sharing results as soon as possible.

### Is this situation impacting the availability of milk?

At this time, milk loss resulting from symptomatic cattle is too limited to have a major impact on supply and there should be no impact on the price of milk or other dairy products. The FDA is not aware of any impact on the availability of pasteurized milk

products nationwide. We will continue to monitor the supply chain impacts and will update this page as necessary.

### **What about cheese sold at retail?**

The FDA does not currently have concerns about the safety and availability of pasteurized milk products, including pasteurized cheese, sold nationwide. Pasteurization has continually proven to inactivate bacteria and viruses, like influenza viruses, in milk and milk products such as cheese. We are continuing to monitor the situation and will provide updates on our website if necessary. Also, see Q/As 5 and 6 regarding cheese made from raw/unpasteurized milk.

### Raw Milk/Cheese Concerns

#### **Are there concerns about HPAI and raw, unpasteurized milk?**

Based on the limited research and information available, we do not know at this time if HPAI A (H5N1) viruses can be transmitted through consumption of unpasteurized (raw) milk and products (such as cheese) made from raw milk from infected cows. However, we have long known that raw milk can harbor dangerous microorganisms (germs) that can pose serious health risks to consumers. According to the [CDC](#), from 1998 through 2018, there were 202 outbreaks linked to drinking raw milk, resulting in 2,645 illnesses and 228 hospitalizations. These outbreaks have typically been caused by the presence of bacteria such as [Campylobacter](#), [Cryptosporidium](#), [E. coli](#), [Salmonella](#), or [Listeria monocytogenes](#) in the raw milk. For more information about how consumers can protect themselves from these risks see our website: [Raw Milk](#).

Because of the limited information available about the possible transmission of HPAI A (H5N1) viruses in raw milk, the FDA recommends that industry does not manufacture or sell raw milk or raw milk cheese products made with milk from cows showing symptoms of illness, including those infected with avian influenza viruses or exposed to those infected with avian influenza viruses. By exposure, we generally mean cattle located on a premises with cattle with suspected or confirmed HPAI A (H5N1). Given the variety of premises sizes and the potential for state requirements, the FDA recommends producers consult with state regulatory officials and their veterinarian for further guidance. Accordingly, the FDA recommends that milk from exposed, asymptomatic cattle only be used for pasteurized milk and milk products whether for human or animal feed channels. The FDA recommends that premises test for HPAI viruses in pooled milk prior to resuming commerce in unpasteurized dairy products following apparent resolution of illnesses on the premises.

Additionally, as it is prohibited to sell raw milk for human consumption in interstate commerce, each state has its own regulations regarding the sale and distribution of raw milk within the state. Therefore, we defer questions or concerns about raw milk to the state authorities in which the raw milk is sold.

### **What about raw, unpasteurized cheese that has undergone aging?**

FDA regulations require a 60-day aging process for unpasteurized cheese, as the aging process may inactivate some bacteria and viruses. However, these regulations are not safety standards, and some pathogens may survive the 60-day aging process. Because we have limited research and information on whether HPAI viruses can be transmitted through raw milk or raw milk products, such as cheese, the FDA recommends that industry does not manufacture or sell raw milk or raw/unpasteurized milk cheese products made with milk from cows showing symptoms of illness, including those infected with HPAI viruses or exposed to those infected with avian influenza viruses, even if the cheese will undergo the 60-day aging process. By exposure, we generally mean cattle located on a premises with cattle with suspected or confirmed HPAI A (H5N1). Given the variety of premises sizes and the potential for state requirements, the FDA recommends producers consult with state regulatory officials and their veterinarian for further guidance. Accordingly, the FDA recommends that milk from exposed, asymptomatic cattle only be used for pasteurized milk and milk products, whether for human or animal feed channels. The FDA recommends that premises test for HPAI in pooled milk prior to resuming commerce in unpasteurized dairy products following apparent resolution of illnesses on the premises.

### **Do consumers need to do anything different to protect against HPAI in food?**

At this time, the FDA is not aware that any milk or milk products from symptomatic cows is entering interstate commerce as milk from impacted animals is being diverted or destroyed so that it does not enter the human food supply. Additionally, pasteurization has continually proven to inactivate bacteria and viruses, like influenza viruses, in milk. Pasteurization is required for any milk entering interstate commerce. FDA's longstanding position is that unpasteurized, raw milk can harbor dangerous microorganisms that can pose serious health risks to consumers, and FDA is reminding consumers of the risks associated with raw milk consumption in light of the HPAI virus detections in dairy cows in some states. Safe food handling and preparation is always important and more information about best practices can be found at [Safe Food Handling](#).

Industry Involvement

### **Is there anything more that dairies should be doing at this time to protect the food supply?**

Farms should continue to monitor their dairy cows for signs of illness to ensure that milk from sick cows does not enter into interstate commerce. Producers that identify illness in their cows should work with the [State Animal Health Official's External Link](#) [Disclaimer](#) office to submit samples for diagnostic testing.

### **Is there anything more dairies should be doing at this time to protect their dairy cows?**

It is critically important that farmers practice good biosecurity measures and contact their [State Animal Health Official](#)[External Link Disclaimer](#) and/or [Area Veterinarian in Charge](#) with concerns about preventing the spread of HPAI viruses. Additional general information about biosecurity on dairies precautions are available at [Enhanced Biosecurity Training | Secure Milk Supply](#)[External Link Disclaimer](#). Producers should continue to closely monitor their cattle for illness, including decline in milk production, and immediately separate sick animals. Milk from these cows should be discarded. If this milk is intended to be used to feed calves or other animals (such as cats living on the dairy farms), the FDA strongly encourages that it be pasteurized or otherwise heat treated to kill harmful bacteria or viruses, including influenza viruses, before it is fed. Many State Cooperative Extension Service programs have published detailed information on how to pasteurize or otherwise effectively treat waste milk before using it to feed calves (for example, Penn State - Pasteurization of Non-Saleable Milk).

### **How should dairies handle the disposal of milk from affected cows?**

The FDA recommends producers take precautions when discarding milk from affected cows so that the discarded milk does not become a source of further spread. Producers should consult with their state regulatory authorities for specific recommendations or requirements, however, such precautions could include heat-treatment or pasteurization of discarded milk prior to dumping in lagoons or application of waste solids and ensuring biosecurity around lagoons (e.g., ensuring that animals and birds do not have access to lagoons).

The FDA recommends producers discard milk from symptomatic cows. Young calves are susceptible to disease and disease-causing pathogens can be transmitted through raw milk. If milk from cows showing symptoms of illness, including those infected with HPAI A (H5N1), cannot be discarded and is intended to be used to feed calves (or other animals, such as farm cats), the FDA strongly encourages that it be heat treated to kill harmful bacteria or viruses, such as influenza, before calf feeding. This heat treatment should be similar to times and temperatures commonly found in commercial milk pasteurization processing.

Any raw milk or raw milk products from exposed cattle that are fed to calves (or to other animals, such as farm cats) should be heat treated or pasteurized. By exposed, we mean cattle located on a premises with cattle with suspected or confirmed infections with HPAI A(H5N1) viruses. Many State Cooperative Extension Service programs have published detailed information on how to pasteurize or otherwise effectively treat milk before using it to feed calves (for example, Penn State - Pasteurization of Non-Saleable Milk). This information also applies to ways to render the milk safe before feeding to other animals.

## What should dairy farms with affected cows do to protect their workers?

For information on recommendations for preventing exposures to HPAI A (H5N1) viruses, use of protective equipment, antiviral treatment, and similar topics visit CDC's webpage [Highly Pathogenic Avian Influenza A\(H5N1\) Virus in Animals: Interim Recommendations for Prevention, Monitoring, and Public Health Investigations](#).

## **Governor DeWine Announces Statewide Open Enrollment for H2Ohio Agricultural Incentive Program**

Source: <https://agri.ohio.gov/home/news-and-events/all-news/H2Ohio-Statewide-Enrollment-Governor-Mike-DeWine>

Ohio Governor Mike DeWine and Ohio Department of Agriculture (ODA) Director Brian Baldrige announced today that H2Ohio's agriculture incentive program is now being offered to producers throughout the state.

Governor DeWine launched H2Ohio in 2019 as a comprehensive initiative aimed at addressing various threats to water quality, including harmful algal blooms caused by phosphorus runoff. H2Ohio's agricultural program, which initially focused solely on farms located in northwest Ohio near Lake Erie, incentivizes farmers to implement science-based, proven best management practices to prevent nutrient runoff and improve water quality.

"H2Ohio is now firmly established in northwest Ohio, giving us the opportunity to take this program to other parts of the state," said Governor DeWine. "We appreciate the commitment that our current H2Ohio farmers have shown to protecting Lake Erie, and we look forward to engaging more producers across Ohio on how they can contribute to cleaner water throughout the state."

Statewide enrollment for row-crop producers who farm in Ohio's 64 counties outside of northwest Ohio's Western Lake Erie Basin will open next week. ODA will enroll 500,000 acres into the program for a two-week sign-up period, beginning Monday April 22, 2024, through Monday, May 6, 2024, with enrollment available on a first come, first served basis.



To apply, farmers should contact their local Soil and Water Conservation District (SWCD) and provide up-to-date soil tests and information on planned crops and rotations, yield goals, and planned fertilizer applications. Producers who enroll will receive support to develop and implement Voluntary Nutrient Management Plans, which encourages better utilization of nutrients applied.

“The progress we’ve made with water quality in northwest Ohio has shown the agricultural community is dedicated to doing their part,” said Ohio Department of Agriculture Director Brian Baldrige. “Offering the same incentives to our farmers across the rest of the state ensures we are all working together to continue to protect our most valuable resource.”

ODA works closely with county SWCDs to administer participant contracts, provide technical assistance, and support producers with the implementation of best management practices. H2Ohio provides producers cost-saving benefits, such as financial and technical assistance, to implement conservation practices that are proven to improve soil health and water quality.

For more information on the H2Ohio initiative, visit [h2.ohio.gov](https://h2.ohio.gov).

## ***New report looks at Ohio agricultural land lost to development***

By Sherrie R. Whaley

SOURCE: [HTTPS://CFAES.OSU.EDU/NEWS/ARTICLES/NEW-REPORT-LOOKS-OHIO-AGRICULTURAL-LAND-LOST-DEVELOPMENT](https://cfaes.osu.edu/news/articles/new-report-looks-ohio-agricultural-land-lost-development)

When it comes to farmland losses in Ohio, the three metropolitan areas of Cleveland, Columbus, and Cincinnati, not surprisingly, lead the way.

A new report by The Ohio State University’s College of Food, Agricultural, and Environmental Sciences (CFAES) took a deep dive into the decline of Ohio farmland acres between the 20-year period of 2002 and 2022.

The counties of Cuyahoga, Franklin, and Hamilton had among the largest percentages of decline in farm numbers, land in farms, and agricultural land lost to development. Cuyahoga County, part of the Cleveland Metropolitan Statistical Area (MSA), experienced the largest decrease in number of farms, with the number dropping by 35%. Franklin County (part of the Columbus MSA), had one of the highest percentages of agricultural land loss to development at 93%.

Ani Katchova, professor and farm income enhancement chair, in the CFAES Department of Agricultural, Environmental, and Development Economics (AEDE) and graduate students Xiaoyi Fang and Rae Ju, compiled and published the report “Ohio Farm Numbers, Land in Farms, and Agricultural Land Lost to Development” in March.



*The overall percentage of agricultural land lost to development in Ohio has been 51% between 2001 and 2021. (Getty Images photo)*

“The 2022 Census of Agriculture data shows the number of farms in Ohio declined by 2.3% and in land in farms declined by 6.4% between 2002 and 2022,” Katchova said. “One number that is concerning to agricultural stakeholders in Ohio is the loss of 931,089 acres in land in farms in Ohio in the last 20 years.”

According to Katchova, the counties with the highest farm numbers in 2022 were Wayne, Darke, Holmes, Licking, and Putman. “While the statewide decline in farm numbers was 2.3% between 2002 and 2022, some counties experienced significantly larger decreases with the top five being Cuyahoga, Franklin, Lawrence, Lake, and Williams counties,” she said. “Conversely, counties such as Coshocton, Jefferson, Ross, Geauga, and Guernsey experienced increases in the number of farms during the same period.”

Among Ohio’s 88 counties, 37 experienced a positive percentage change in the number of farms, four counties had almost no change, and the remaining 47 counties experienced a negative percentage change. The spatial distribution in 2022 saw a larger number of farms in the central regions of Ohio, in contrast to a lower number of farms found in the northeastern and southeastern parts of the state. Over this 20-year span, a general decrease in the number of farms was noted across many counties, with the southeast regions facing the most significant reductions.

The Ohio State team compiled their report using satellite imagery from the National Land Cover Database (NLCD) of the Multi-Resolution Land Characteristics Consortium. The database shows land of different categories and changes in land categories over time.



The definition of agricultural land according to the NLCD includes cultivated crops and pasture/hay, which is narrower than the Census of Agriculture’s more general definition of land in farms (which also includes woodland, wasteland, and land in conservation programs). The NLCD defines several categories for developed land – high, medium, and low intensity developed land and open space developed land.

“Our report provides a helpful snapshot of Ohio’s agricultural land to county and state officials, Ohio Department of Agriculture, Ohio Farm Bureau, and the agricultural industry. Ag stakeholders have been very concerned about the declining farm numbers and farmland being developed,” Katchova said. “Using these statistics, the best estimate for the agricultural land lost to development in Ohio is 180,691 acres over the last 20 years compared to the loss of 931,089 acres of land in farms in Ohio farms during the same time period.”

While counties located in the MSA’s had among the largest percentages of agricultural land loss to development, the overall percentage of agricultural land lost to development in Ohio has been 51% between 2001 and 2021.

Read Katchova, Fang, and Ju’s full report at [go.osu.edu/CqBN](https://go.osu.edu/CqBN).

## ***Same ol’ Farm Drainage Research? No, Think Future.***

By Bruce Clevenger, Nick Eckel, Vinayak Shedekar

Source: <https://agcrops.osu.edu/newsletter/corn-newsletter/2024-12/same-ol-farm-drainage-research-no-think-future>

Climate projections by climatologists suggest that the Midwest will experience wetter and warmer winters and springs and hotter and drier summers. One estimate suggests that by the end of the century, Ohio’s summers will resemble those of current-day Arkansas and winters will resemble those of current-day North-Carolina. With more intense rain events delivering larger quantities, producers seem to prefer narrower drain spacing than the traditional designs. Can farmland be over-drained with narrow tile spacing leading to unintended consequences when wet springs turn into dry summers?

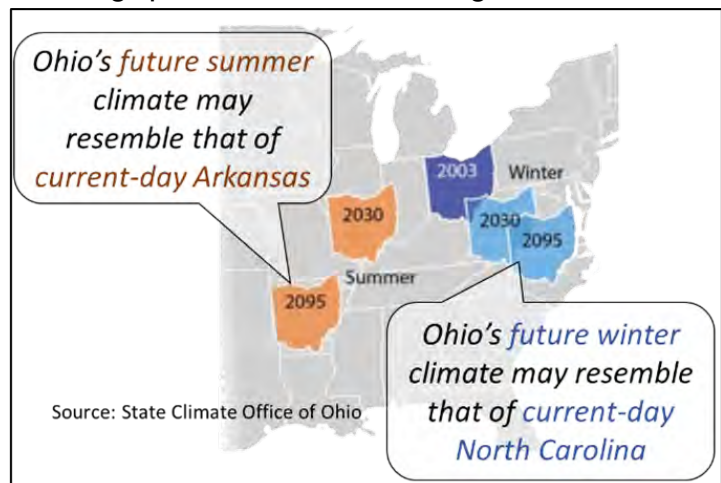


A research team at The Ohio State University has designed and implemented plot experiments that takes OSU’s long-term drainage research a step further and explores how intense drainage in combination with management decisions will impact crop

productivity and economics. The experiment is located at OSU's Northwest Agricultural Research Station in Hoytville, OH and begins in 2024. Formerly known as the drainage-tillage-rotation study, the new experimental design maintains the 40-foot tile drain spacing compared to undrained plots and adds 25-foot tile drain spacing treatment. Additionally, three different tillage treatments will continue (no-till, chisel plot, and strip till) with the addition of a cover crops treatment. The crop rotation treatment will ensure that corn and soybean are both grown in each year in an alternate rotation. The 3 drainage x 3 tillage x 2 cover crop x 2 crop rotation treatments replicated twice result in 24 subplots. A pseudo-replication within plots will allow for doubling the number of subplots within each treatment combination. In addition to agronomic monitoring, the team plans to monitor the hydrologic water budget in the plots. A mini research grant supported by the Ohio Soybean Council provided seed funding to initiate monitoring of water table, soil moisture, temperature, and electrical conductivity. Additional financial support came from the Virgil Overholt Drainage Education and Research Program at OSU.

The research team will address the following questions with this long-term

experiment: How do changes in tile drain spacing influence trafficability in the early growing season as well as soil moisture throughout the growing season? What are the effects of drainage intensity and land management (i.e., tillage type, crop rotation, cover crop) on soil moisture availability, crop stress, crop yield, and economics? How do these drainage and land management practices affect soil health in the long-term? Are there differences in the prevalence and abundance of soil-borne pathogens (e.g., phytophthora, pythium, rhizoctonia) under different drainage intensity and land management practices? Do foliar diseases differ across these treatments?



Meet the research team: Dr. Vinayak Shedekar, Assistant Professor in the Department of Food, Agricultural and Biological Engineering at The Ohio State University and serves as the State Extension Specialist for agricultural water management. Nick Eckel, Agriculture and Natural Resources Extension Educator in the Wood County Extension Office. Mr. Eckel has expertise in agronomy and monitoring crop growth monitoring, scouting for pests and diseases, and sampling of soil and tissue samples. Matt Davis is the manager of the Northwest Agricultural Research Station in Custar, Ohio. He is responsible for conducting farm operations as per the experimental design and measuring the crop yields in each individual research plot. Wm. Bruce Clevenger, Ohio State University Extension Field Specialist, Farm Management specializes in economic analysis of agronomic systems and drainage treatments.



## ***Change in Ohio law creates new “low risk” license for mobile food vendors***

By Peggy Kirk Hall

Source: <https://farmoffice.osu.edu/blog/thu-04252024-724am/change-ohio-law-creates-new-“low-risk”-license-mobile-food-vendors>

In time for another farmers’ market season, Ohio has a new food license available for food entrepreneurs who sell eggs, meats, and certain home-produced foods at farmers markets and similar venues. A new “Low Risk Mobile Retail Food Establishment license” (Low Risk MRFE) offers a lower risk level license that will benefit many of Ohio’s farm-based and home-produced food vendors.

Regulations establishing the new license were effective on February 12, 2024.

Ohio law has historically required an MRFE license for vendors selling certain foods from mobile units such as trucks, trailers, tents, and stalls at farmers markets and similar locations. All mobile vendors, regardless of the risk level of the food they were selling, had to obtain the same type of MRFE license. That



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changes with the new regulations, which create two types of MRFE licenses, low risk and high risk, and different licensing requirements for each.

The new Low Risk MRFE license offers two positive changes for the mobile food vendors who qualify for it:

- The Low Risk MRFE license will be half the cost of the High Risk MRFE license, and,
- Low Risk MRFE license holders can use non-mechanical refrigeration rather than commercial equipment to maintain their food product temperatures.

Here's an explanation of the new Low Risk MRFE license option.

### **Mobile vendors that qualify for the Low Risk MRFE license**

The Low Risk MRFE license is available for mobile vendors whose activities fall into a low risk level. Low risk level activity means the food poses a potential risk to the public in terms of sanitation, food labeling, sources of food, and food storage practices at the mobile unit, but the risk is lower than higher risk food activities. Low risk activities involve foods that were “pre-packaged” before being brought to sell at the mobile unit, and include the activities of holding pre-packaged refrigerated or frozen foods that require temperature controls for safety and offering pre-packaged foods that do not require temperature controls for safety. See [Ohio Admin. Code 901:3-4-05\(E\)](#)

If pre-packaged, these foods that are held and offered for sale from a mobile unit will qualify for the Low Risk MRFE:

- Eggs
- Frozen and refrigerated meats and fish
- Foods from a licensed Home Bakery that require refrigeration, such as cheesecakes and cream pies
- Cheeses and dairy products from a licensed Milk Producer or Milk Processor
- Frozen foods from a facility with a Frozen Foods License
- Cottage foods from a cottage food operation, but the MRFE is not required if the cottage foods are sold at any of these locations: farmers market, farm market, registered farm product auction, a political subdivision sponsored festival or celebration, or direct from the producer's residence.

### **Holding temperature requirements for a Low Risk MRFE**

There has long been confusion about the type of equipment an MRFE vendor must use to maintain the temperature of refrigerated or frozen foods, and some health departments have required vendors to use only commercial refrigerators or freezers. That will change under the new rule, which allows a Low Risk MRFE license holder to choose whether to use mechanical or non-mechanical

refrigeration such as ice, ice packs, gel packs, or dry ice. The rule does not require the use of commercial equipment.

There are several important points mobile vendors should note about the new rule:

- When applying for the MRFE license or renewal, a vendor should explain their refrigeration choice and method, and the health department might require a plan or process for replenishing the cooling material if using non-mechanical equipment. The health department will note the refrigeration information on the MRFE license.
- The new rule requires a vendor to refresh or replenish the ice, ice packs, gel packs, or dry ice every four hours.
- A vendor should keep a working thermometer inside each cooler or refrigerating unit and be able to document that the temperature is within the allowable range for the food held in the unit.
- Gel packs and dry ice are preferred non-mechanical methods for maintaining food packaged in paper because wet ice can destroy paper packages and increase food safety risk.
- See [Ohio Admin. Code 3717-1-04.1\(K\)\(K\)](#)

### **Lesser fee for Low Risk MRFE licenses**

The new rule specifies that a Low Risk MRFE license fee will be 50% of the health department's fee for high risk MRFEs. See [Ohio Admin. Code 901:3-4-03\(A\)](#)

### **New signage requirement for MRFEs**

The new rule also requires any MRFE vendor to display specific information on the exterior of the mobile unit, in individual lettering at least three inches high and one inch wide. The information must include:

- Name of the operation
- The operation's city of origin
- The operation's telephone number, including area code
- See [Ohio Admin. Code 901:3-4-02\(I\)](#)

### **High Risk MRFEs**

A High Risk MRFE creates higher potential risks due to concerns with receiving, holding, cooking, cooling, processing, handling, and heating food products. Activities such as assembling or cooking, heating, and reheating foods are high risk activities. A few examples of high risk activities include making kettle corn or soft serve ice cream. Most farm-based and home-produced food activities will not require the High Risk MRFE. See [Ohio Admin. Code 901:3-4-05\(E\)](#)

For additional questions about the new Low Risk MRFE license, contact your [local health department](#) or the Ohio Department of Agriculture's [Food Safety Division](#).

## **Genetic hope in fight against devastating wheat disease**

Source: <https://www.sciencedaily.com/releases/2024/04/240426110036.htm>

Fungal disease Fusarium head blight (FHB) is on the rise due to increasingly humid conditions induced by climate change during the wheat growing season, but a fundamental discovery by University of Adelaide researchers could help reduce its economic harm.

While some types of wheat are resistant to FHB thanks to the action of the TaHRC gene at the *Fhb1* locus, how this gene functions in wheat cells was unknown until now. Collaborating with Nanjing Agriculture University, the University of Adelaide research team has shown TaHRC works in the nucleus of wheat cells, and it can either increase or decrease a plant's susceptibility to FHB.

"There are two variants of TaHRC that have opposing effects on the condensation of a specific protein complex within the nucleus," says Dr Xiujuan Yang, from the University's School of Agriculture, Food and Wine.

"When condensed, the complex leads to susceptibility to FHB, whereas when diffused, it provides resistance against FHB.

"We are the first to reveal the function of protein complex condensation in response to a major crop fungal disease, providing insight into the mode of action of protein complexes in cereal defence responses."

FHB has caused significant harm to Australia's wheat industry in recent years, with crops in the 2022 season suffering up to 100 per cent yield losses.

The disease has been on the rise globally since the 1970s, but climate change has increased its prevalence.

"Australia's reputation for producing high-quality wheat has been built on fortuitous climate conditions during flowering and grain fill, typically coinciding with the dry season, which helps avoid many fungus-caused diseases that thrive in humid weather," says Dr Yang.

"However, in the background of climate change, a wet spring in 2022 led to Fusarium head blight becoming widespread across eastern Australia."

Australian durum wheat varieties are all highly susceptible to FHB, but it is unclear what level of resistance exists in bread-wheat varieties.

Dr Yang hopes this fundamental discovery, published in *Cell Host & Microbe*, will counteract the growing prevalence of FHB and provide assurance to Australian growers.

"Our findings offer exciting prospects for developing new and enhanced forms of Fusarium head blight resistance," Dr Yang says.

"By understanding the underlying mechanisms beyond Fhb1, we can innovate breeding strategies to diversify resistance sources.

"Our research opens the door to the development of more resilient and sustainable wheat varieties for future agriculture, and might shed light onto other Fusarium-caused diseases, such as crown rot."