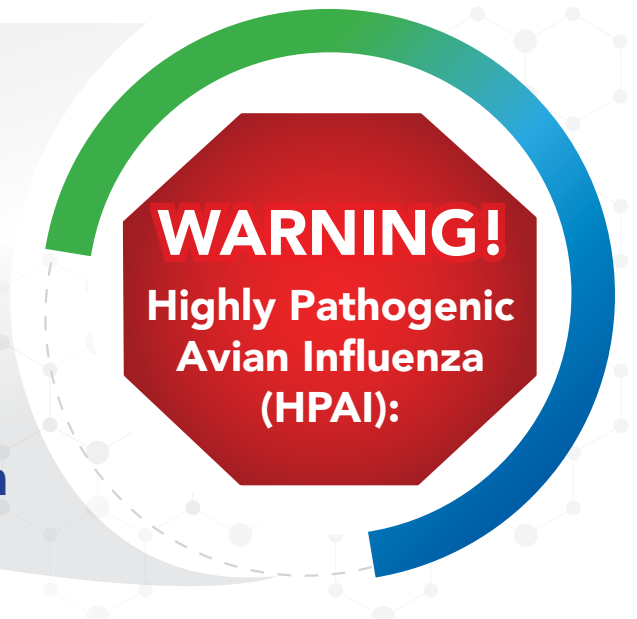


HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI): Understanding, Identification, Prevention



April 5, 2024

As confirmed cases on dairy farms in the states of New Mexico, Texas, Kansas, Michigan, and Ohio continue to grow and potentially spread to other dairy states, the focus turns to understanding, identification and prevention of the spread of this highly contagious disease. This article provides a summary of practical guidelines from leading North American animal wellness experts to aid you in helpful action steps on your dairy.

Managing the threat of HPAI in dairy farms requires a comprehensive approach that includes an understanding and identification of the disease, and preventive measures.



UNDERSTANDING

What is HPAI? HPAI is a highly pathogenic virus that is part of a type of Influenza A virus that primarily affects birds (H5N1). The *highly pathogenic* classification is based on the severity of the disease in poultry, but not specifically in mammals or humans.

How do dairy cows get the disease?

Migrating waterfowl have been found to be reservoirs of the disease, and according to the USDA, are considered to be the disease source. This virus has been devastating to the poultry industry, causing high levels of mortality, however this has not been the case with dairy herds. Currently there has been no single identified disease transmission pathway, however there are several probable transmission routes:

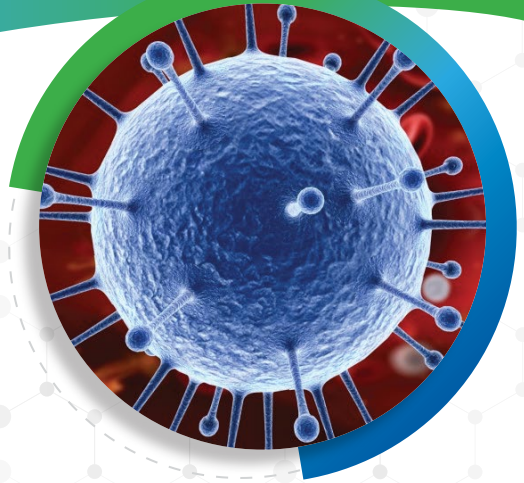
o Mouth / nasal secretions:

Consuming contaminated feed or water. **(Water has a higher likelihood of transmission due to the number of animals drinking from the communal water source.)**

o **Milk:** Possible cow-to-cow transmission of diseased milk through operator or equipment contact

DISEASE IDENTIFICATION³:

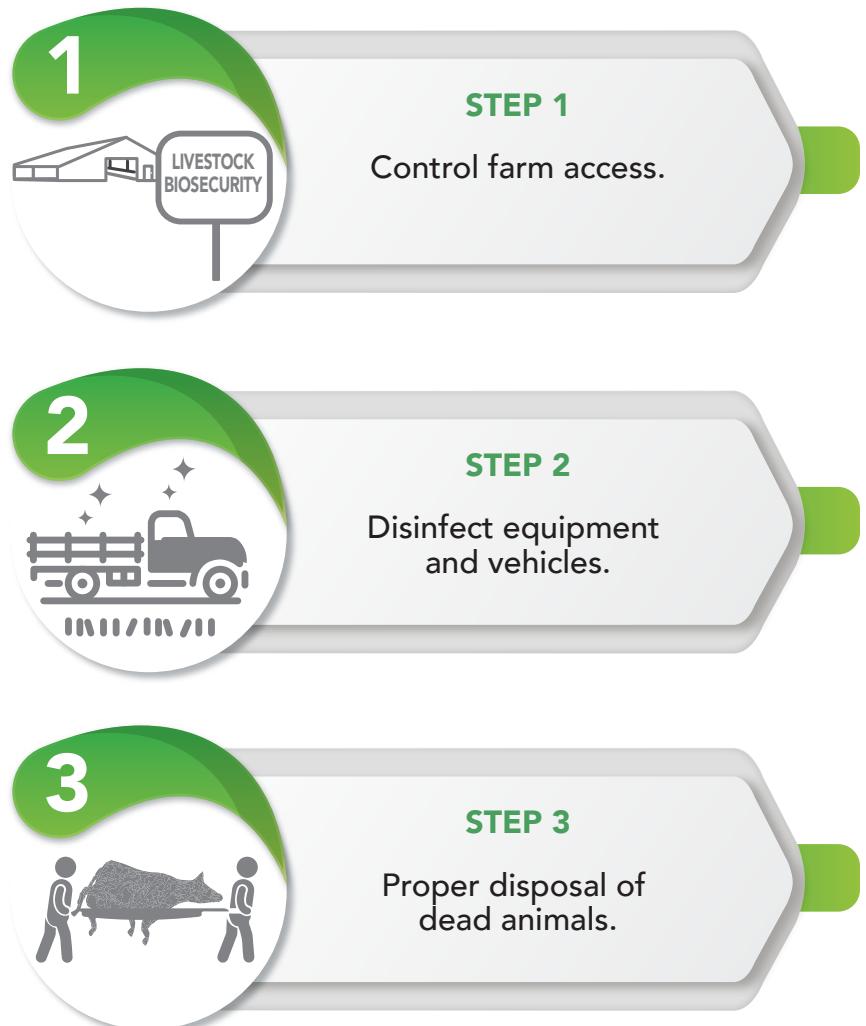
- Drop in feed intake / rumination / rumen hypomotility
- Decrease in milk yield
- Changes in the milk texture and color:
 - Thicker and often yellowish to brown, resembling colostrum
 - Many severe cows appear to have all quarters involved, but not in all cows
 - Widespread increase in milk conductivity
 - Changes in manure
 - Respiratory symptoms
- Most of the severe cases are from older, mid-lactation cows
- **Time Course:**
 - Most herds pull cases for 10 – 14 days
 - Peak pulls between 3 – 7 days into the outbreak
 - Herds are reporting 10 – 20% of cows to the hospital for examination and treatment
 - Most cows start coming back on feed intake within a few days
 - Herds seemingly are taking 30 - 45 days to begin to see BTSCCs come down to pre-outbreak levels and per cow milk production to approach pre-outbreak levels



PREVENTIVE MEASURES:

Creating a prevention system to curb the spread of Highly Pathogenic Avian Influenza (HPAI) in commercial dairies is crucial for protecting the health of the herd and ensuring the continuity of dairy operations.

- **Biosecurity Protocols:** Establish strict biosecurity measures to prevent the introduction and spread of HPAI. This includes control of farm access, disinfection of equipment and vehicles, and proper disposal of dead animals



PREVENTIVE MEASURES (CONT'D):

- **Water Management⁴:** Prevent access of dairy cows to open water sources that may be contaminated by wild birds. Instead, use closed water systems where possible:
 - **Chlorine Dioxide Water Treatment:** Implement chlorine dioxide treatment protocols tailored to the farm's water system. This may involve continuous or periodic dosing based on water flow rates and usage
 - **Monitoring ORP Levels:** Use ORP meters to monitor the germicidal capacity of treated water. ORP levels of 650 mV or higher typically indicate sufficient disinfecting power to inactivate viruses like HPAI
- **Wildlife Management:** Implement measures to discourage wild birds from accessing areas frequented by the dairy herd, particularly water sources
- **Assessment of Water Systems:** Evaluate the dairy farm's water systems to determine the most effective points for chlorine dioxide treatment.
 - **Regular Testing:** Conduct regular testing of water samples to ensure the effectiveness of the chlorine dioxide treatment and adjust dosing as necessary
 - **Safety Measures:** Ensure that chlorine dioxide treatments are carried out in accordance with safety guidelines to prevent harm to animals, humans, and the environment
 - **Treating Water Supplies⁵:** Treating water has the potential to reduce the spread of HPAI, if the theories of water born spread are true, and improving water quality will help every dairy maximize potential milk production and therefore profitability. Due to the recent outbreak, now might be the perfect time to make management changes to improve overall water quality



- **Ongoing Education and Training**
 - **Staff Training:** Provide ongoing training for farm staff on the importance of water treatment and biosecurity measures in preventing HPAI
 - **Information Sharing:** Share information and best practices with neighboring farms and through dairy industry associations to help prevent the spread of HPAI in the broader community

Implementing these measures requires a coordinated effort among farm management, staff, and veterinary health professionals. Regular review and adaptation of these protocols are crucial as new information about HPAI and its control becomes available.





WHY AN ORP METER?

Because it's the perfect tool to evaluate the effectiveness of a water treatment program. The meter will accurately measure the disinfection strength of a solution, as well as determine a baseline level, and this will point the direction toward a more complete program of contaminant eradication.

Based on this level, the Acepsis™ Representative can utilize the knowledge acquired from numerous past system successes, to determine the strength of the solution being used, the frequency of automatic dosing, and a projected timeline before complete success is achieved.

ORP Values In Pathogen Disinfection* PATHOGEN SURVIVAL IN SECONDS (S) OR HOURS (H) AT ORP LEVELS (MV)

Pathogens	<500 ORP (mV)	500 - 600	600 - 700	700+
E. COLI (0157:H7)	> 300 S	< 60 S	< 10 S	< 1 S
SALMONELLA SPP.	> 300 S	> 300 S	< 20 S	< 1 S
LISTERIA MONOCYTOGENES	> 300 S	> 300 S	< 30 S	< 1 S
THERMO-TOLERANT COLIFORM	> 48 H	> 48 H	< 30 S	< 1 S

*Oxidation Reduction Potential (ORP) for Disinfection Monitoring, Control and Documentation; University of California, Trevor Suslow, Department of Vegetable Crops, University of California - Davis



¹Ohio State Buckeye Dairy Network Newsletter – March 26, 2024

²Danelle Bickett-Weddle, DVM, MPH, PhD, DACVPM – Preventalytics

³Dr. Brandon Treichler, DVM, Quality Control Veterinarian, Select Milk Producers

⁴Dr. David Kolb, DVM, Acepsis, LLC

⁵Dr. David Reid, DVM, Rocky Ridge Dairy Consulting, LLC

For more information, call Acepsis™ or your local representative.



ACEPSIS™, LLC is an animal health based company that is focused on the development of state-of-the-art animal hygiene technologies. Our Company's mission is to apply innovative animal hygiene technologies into the agricultural and veterinary market sectors.