National Assembly of State Animal Health Officials (NASAHO)
National Association of State Public Health Veterinarians (NASPHV)

Measures to Minimize Influenza Transmission at Swine Exhibitions, 2018

Livestock shows are an important learning opportunity for thousands of 4-H and FFA youth across the United States. For these youth, exhibiting at their county or state fair represents the culmination of many months of work dedicated to the care and training of their animals. Agricultural exhibitions also provide meaningful opportunities for the public to learn about animal agriculture, observe animal behavior, and experience what it might be like to live on a farm. More than 150 million people visit agricultural fairs each year in North America.

Influenza can spread wherever animals or people congregate, and agricultural fairs are no exception. While rare, influenza A viruses can spread from people to pigs and from pigs to people. When a person is infected with a swine-origin influenza A virus, it is termed a variant virus infection, and denoted with a "v" after the subtype (e.g. H3N2v).[1] (Note that the same virus when found in pigs does not carry the "v" denotation.) In the past 7 years, human cases of influenza A H1N1v, H1N2v, and particularly, H3N2v have been associated with exposure to swine at exhibitions. Between 2011 and 2017, 426 human H3N2v cases were reported from 18 states.[2] The largest outbreak occurred in 2012 when a total of 309 human cases of H3N2v flu were identified, including 16 hospitalizations and one death.[3] In 2017, a total of 67 variant virus infections (62 H3N2v, 1 H1N1v, and 4 H1N2v) were identified from 10 states (CDC, personal communication). The majority of these variant cases were exhibitors and others who reported close contact with pigs at agricultural fairs prior to their onset of illness.

The Swine Exhibitions Zoonotic Influenza Working Group first gathered in December 2012 to develop a set of measures to minimize influenza virus transmission at swine exhibitions. The group reviewed the document again in 2014 and 2015, and made minor updates. In 2016, because of important new data regarding the dynamics of influenza transmission between swine at exhibitions,[4-7] the measures for prevention were strengthened and augmented. In particular, a 2015 study by Bowman et al. found that at swine shows, the prevalence of influenza A-positive pigs increases substantially at 72 hours.[8] This finding further supported the recommendation that exhibition swine should be kept on the exhibition grounds no longer than 72 hours. With this 2018 edition, there is the addition of an easily accessible checklist for exhibition organizers and youth organization leaders: "Minimizing Influenza Transmission during Exhibitions – Checklist for Protecting Guests, Exhibitors, and Pigs."

The suggested measures in this document are organized to address activities before, during, and after swine exhibitions. It may not be possible to prevent all transmission of influenza viruses at swine exhibitions. The measures described here are offered for careful consideration depending on the needs of the specific exhibition and can be implemented in part or in total. They are not intended to supersede local, state, or federal regulations. These measures were formulated based on current evidence and the collective knowledge of the Swine Exhibitions Zoonotic Influenza Working Group. It is expected that this document will be updated as additional information becomes available.

The Centers for Disease Control and Prevention (CDC) recommends that everyone 6 months of age or older be vaccinated annually against seasonal influenza.[9] This is particularly important for people who

are involved with swine shows because swine are susceptible to human seasonal influenza viruses and people can get swine-origin influenza viruses. Vaccination helps to protect people and pigs. In addition, some people are more likely to experience complications from influenza that can result in hospitalization and sometimes death. People at high risk for developing severe complications include children younger than 5 years of age, people 65 years of age and older, pregnant women, and people with certain long-term health conditions (such as asthma, diabetes, heart disease, chronic respiratory disease, weakened immune systems, and neurological or neurodevelopmental conditions.)[10] People in these high-risk groups should be made aware of their increased risk through signage and other educational efforts, and they should avoid contact with infected swine.

Measures to Consider BEFORE the Exhibition

For Exhibition Organizers and Youth Organization Leaders

- Collect sufficient contact information (i.e. email addresses and cell phone numbers) from all exhibitors to be able to rapidly communicate procedural changes, requests for information, or incidents associated with the exhibition.
- Collect contact information for state animal health officials and local or state public health officials to ensure they can be reached if they are needed during an event. Contact information should be posted in a centralized location that is accessible to the exhibit organizers as well as exhibitors.
- Maintain records of individual swine identification and source farms to enhance the speed and accuracy of an animal disease investigation associated with the exhibition.
- Establish a relationship with a veterinarian who will be present or on call for the duration of the exhibition. The veterinarian will be responsible for monitoring the animals for clinical signs, evaluating sick animals and taking steps to ensure that ill swine are isolated.
    - The veterinarian should be prepared to contact the State Veterinarian and Veterinary Diagnostic Laboratory, and to sample pigs with signs of influenza, if needed
- Obtain or create informational signage for the entrance of the exhibition area that includes the following messages:[11]
    - All animals can carry germs that make people sick
    - Some people are more likely to get sick and may become severely ill: babies and children under 5 years of age, pregnant women, older adults, and people with weakened immune systems or chronic illnesses
    - Wash your hands with soap and water right after visiting the animals
    - No food, drinks, baby bottles, pacifiers, toys or strollers in animal areas
    - Make sure kids don't put their fingers or other things in their mouths
- Ensure that handwashing stations with running water, soap and paper towels will be available near the exit of the exhibition area.
- Obtain signs for the exits that instruct visitors to wash their hands when leaving the animal area.
- Locate food service areas away from animal barns.
- Host non-animal-related activities (i.e. dances, pizza parties, etc.) in locations other than animal barns.
- Limit the time pigs are congregated, co-mingled, and held at an exhibition:
    - Whenever possible, exhibition swine should be kept on the exhibition grounds no longer than 72 hours
    - Discourage "holdover pigs" that are held on the exhibition grounds and exhibited in additional shows

    - Release pigs from the exhibition grounds as soon as possible following their respective show(s)
    - If offering both terminal pig and breeding swine shows, schedule the terminal show after the breeding swine show or schedule a break between shows. Use this break to clean and disinfect the facility
    - Locate longer-term swine exhibits (i.e. big boars, birthing center animals, display exhibits of pigs) away from areas where competition swine are housed
- Identify a temporary isolation area for sick pigs on or near the exhibition or fairgrounds.
    - Establish a protocol to immediately isolate sick swine
- Clean and disinfect the barn prior to the animals coming in.
    - Clean and disinfect pens, gates, chutes, sort panels, and any equipment that will be used during weighing and identification procedures
    - Use approved disinfectants that are safe for human and animal contact: https://www.epa.gov/sites/production/files/2018-01/documents/2018.10.01.listm_.pdf
    - Establish a protocol and prepare for cleaning and disinfection of chutes and equipment between groups of animals on entry day and during the fair: http://www.cfsph.iastate.edu/Disinfection/index.php
- Create a written enhanced biosecurity protocol for use in case of an outbreak of influenza in pigs or people.
    - Include state animal health officials, state or local public health officials, and fair veterinarians in the planning group
    - Gather basic supplies and personal protective equipment such as disinfectants, thermometers, gloves, masks, goggles, and disposable boots

For Exhibitors

- Consult a veterinarian to help outline and implement applicable biosecurity and swine health practices at home.
- Discuss the use of swine influenza vaccines with a veterinarian and check the exhibition rules for any requirements. Vaccines are available commercially and may be used prior to an exhibition as long as slaughter withdrawal times are observed as appropriate. Swine vaccinated for influenza may be less likely to become ill, and if they become sick, they may be contagious for a shorter time-period.[12, 13]
- Become familiar with the clinical signs of influenza and other illnesses in pigs (off feed, lethargic, fever, nasal discharge, and cough).
- Seek veterinary assistance if a pig becomes sick.
- Understand the risks to both humans and animals of taking a sick pig to a show. Sick pigs need to stay home so they do not risk infecting other pigs or people.
- Likewise, sick people can be infectious to pigs and other people. People with influenza-like illness should stay away from pigs and other people until they are fever-free for at least 24 hours without the use of fever-reducing medication.[14]
- Ask the exhibition organizer about any specific actions that may be required if a pig becomes sick at the show.
- Clean and disinfect all tack, feeders, waterers, and show supplies before bringing them to the fair.
- Allow at least 7 days of “down time” (i.e. on-farm quarantine) after returning from a previous exhibition before showing a pig or pen-mates, to reduce the risk of spreading influenza.

For State Animal and Public Health Officials

- Each state should establish and maintain a communications network that includes exhibition organizers and managers, youth organization leaders, state animal health officials, state and local public health officials, show veterinarians, Cooperative Extension Service educators, vocational agriculture instructors and other stakeholders.
- State animal health officials should develop a testing protocol for swine that have clinical signs consistent with influenza.
    - Plan to distribute test results to the appropriate animal health and public health agencies, as well as the exhibitor/owner
- State or local public health officials should coordinate with exhibition organizers and youth agriculture organizations to develop a testing protocol for exhibitors who develop influenza-like-illness during or after the exhibition.
    - Plan to distribute test results to the appropriate animal health and public health agencies, keeping the identities of ill persons private

Measures to Consider DURING the Exhibition

For Exhibition Organizers and Youth Organization Leaders

- Track arrival, stalling, and release of pigs, so that that the identification of pigs by pen location is easily available.
- Host a meeting with exhibitors and their family members at the start of the exhibition to:
    - Review exhibition regulations
    - Provide contact information for the designated exhibition veterinarian
    - Review animal disease control measures to be utilized during the exhibition, including the daily monitoring of the animals during the show
    - Provide instructions on how to monitor and report sick pigs
    - Explain any specific actions that may be required if a pig becomes sick at the show
    - Provide instructions on actions to take if exhibitors or family members develop influenza-like illness
    - Explain and encourage good hygiene practices for people and animals such as washing hands, not eating in the barn, not sharing equipment, maintaining clean animals and pens
    - Discourage sleeping in the animal areas
- Clean and disinfect gates, chutes, sort panels, and any equipment used during weighing and identification procedures frequently, ideally between each group of pigs.
    - For information on how to use disinfectants: http://www.cfsph.iastate.edu/Disinfection/index.php
    - For disinfectants that are approved and safe for human and animal contact: https://www.epa.gov/sites/production/files/2018-01/documents/2018.10.01.listm_.pdf
    - Keep the environment as dry as possible to avoid animal injury
- Monitor the weather forecast.
    - For extreme heat conditions consider altering arrival and release schedules to minimize heat stress
    - Control ambient temperature by increasing ventilation and using other methods for cooling (i.e. sprinklers on roof)

For Exhibitors

- Avoid sharing tack with other exhibitors, but if you must, clean and disinfect in-between uses.
- Observe swine regularly for signs of influenza-like illness (e.g. off feed, lethargic, fever, nasal discharge, and cough).
    - Report any influenza-like illness to the designated show veterinarian or the appropriate exhibition staff so the pig can be evaluated right away
    - Swine that are ill should be removed from the exhibition immediately or moved to a temporary isolation area on or near the exhibition or fairgrounds
- Use precautions when caring for sick pigs to minimize the opportunity for disease transmission to other swine or people; for example:
    - Limit the number of people caring for sick pigs
    - Use personal protective equipment
    - Wash hands thoroughly with soap and water after working with sick pigs
    - Avoid moving bedding and other materials from sick pig areas into areas where healthy pigs are kept
    - Clean and disinfect equipment

Measures to Consider if there is an Outbreak of Influenza in Pigs or People

For Exhibition Organizers and Youth Organization Leaders

- Notify and work with the show veterinarian.
- Notify animal health officials- the State Veterinarian.
- Notify local or state public health officials- the State Public Health Veterinarian or Zoonotic Disease Epidemiologist.
- Implement enhanced biosecurity protocol.
    - Limit access to pigs and the barn area, especially to people at high risk. Additional signage should be posted warning people about the occurrence of influenza, including information about increased risk of serious illness for persons in high-risk groups
    - Use personal protective equipment in the barn. For Influenza A, this means gloves, disposable or washable boots, coveralls or Tyvek suit, goggles and a mask or N95 respirator.
    - Work with animal health and public health officials to facilitate testing of sick pigs and sick people
    - People with influenza-like-illness should be advised to leave the exhibition and seek medical care. Public health should be notified so that special testing for variant influenza infection can be facilitated with the person's healthcare provider
    - Enhance cleaning and disinfection protocols
    - Isolate sick animals
    - Sick pigs designated for marketing should remain in isolation until the animals have recovered. Movement or release would be under the authority of state animal health officials
- Implement communication channels.
    - Identify an official spokesperson for the media
    - Identify someone to facilitate and coordinate messaging with animal and public health authorities, the show/fair managers, and industry representatives

For State Animal and Public Health Officials

- Public health and animal health officials should work together to investigate the source of illness and take appropriate actions to prevent transmission.
- Communications with media and the public should be coordinated jointly so that state agencies can provide the same messages.
- Public health officials should facilitate human testing for influenza, and attempt to identify additional human cases.
- State animal health officials should facilitate testing of sick animals and control animal movement to and from the facility.
- After the outbreak, a meeting should be held including animal health, public health, exhibition organizers, and youth organization leaders to discuss challenges and lessons learned.

Measures to Consider AFTER the Exhibition

For Exhibition Organizers and Youth Organization Leaders

- Clean and disinfect the swine exhibition areas, including chutes and equipment.
- Hold a debrief meeting to discuss what went well and improvements for next year.
    - Focus on any new information that was learned and review input from exhibitors, event organizers, public and animal health authorities that will impact future operations

For Exhibitors

- Isolate and observe animals daily for illness after returning home and before allowing contact with other animals.
    - The isolation/observation period for clinical signs of influenza should be no fewer than 7 days
    - Clean and disinfect tack, waterers, feeders, show equipment, clothing, shoes, and vehicles/trailers that were at the exhibition
    - Consult a veterinarian if pigs become ill
- Consult a health care provider and your state or local public health department if exhibitors or family members develop influenza-like illness.
    - Inform the health care provider of exposure to swine
    - Persons with influenza-like-illness should be tested for influenza virus with guidance from public health staff. Special testing is required to identify variant influenza infections
    - Ill people should avoid contact with swine and stay away from other people until they are fever-free for at least 24 hours without the use of fever-reducing medications

References

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13. Sandbulte MR, et al. "Optimal Use of Vaccines for Control of Influenza A Virus in Swine." *Vaccines* 2015; 3(1): 22-73.
14. Centers for Disease Control and Prevention webpage: What People Who Raise Pigs Need to Know about Influenza (flu) (2014). Retrieved January 22, 2018, from https://www.cdc.gov/flu/swineflu/people-raise-pigs-flu.htm

Other Resources

- National Pork Board Website: A Champion's Guide to Youth Swine Exhibition: Biosecurity and Your Pig Project, 2013. Retrieved January 29, 2018 from http://porkcdn.s3.amazonaws.com/sites/all/files/documents/NPB%20A%20Champions%20Guide%20to%20Youth%20Swine%20Exhibition.pdf

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