

Contact Information:**Primary State Health Department Coordinator**

Carrie Klumb, MPH
Epidemiologist Senior, Zoonotic Diseases Unit
Minnesota Department of Health
625 Robert St. N
St. Paul, MN 55155
carrie.klumb@state.mn.us
651-201-5123

Primary Minnesota Board of Animal Health Coordinator

Beth Thompson, JD, DVM
State Veterinarian and Director, Minnesota Board of Animal Health
625 Robert St. N
St. Paul, MN 55155
beth.thompson@state.mn.us
651-201-6844

Primary Agricultural Organization Coordinator

Joseph Rand, M.Ed
Extension Educator
Center for 4-H Youth Development
Extension Regional Office, St. Cloud
3601 18th St. S #113
St. Cloud, MN 56301
joerand@umn.edu
320-203-6064

Additional Contributors

Joni Scheftel, DVM, MPH, DACVPM
State Public Health Veterinarian
Supervisor, Zoonotic Diseases Unit
Minnesota Department of Health
joni.scheftel@state.mn.us
651-201-5107

Malia Ireland, DVM, MPH
Epidemiologist, Zoonotic Diseases Unit,
Minnesota Department of Health
625 Robert St. N
St. Paul, MN 55155
malia.ireland@state.mn.us
651-201-5136

Public/animal health problem in Minnesota:

Minnesota is an agricultural state with a strong 4-H infrastructure, including 1,500 4-H clubs in 87 counties. Each year more than 33,000 youth participate in long-term 4-H club activities in Minnesota. Of these, more than 22,000 (67%) youth are involved in one or more livestock projects, many of which culminate in a trip with their show animal to a county fair and then to the Minnesota State Fair.

A highlight of a 4-H kid's summer, agricultural fairs also provide a fun opportunity for visitors to observe animal behavior, and learn about animal agriculture and where food really comes from. They provide a glimpse into rural and farm life. However, fairs, and other venues where the public has contact with farm animals, also pose a risk to visitors (and animal exhibitors) for zoonoses, those diseases that can transfer between animals and humans. Common zoonotic agents found at these venues include enteric pathogens such as *E. coli* O157, *Salmonella*, and *Campylobacter*, zoonotic influenza viruses, and ringworm. Handwashing and other precautions minimize risk for transmission of zoonotic diseases spread through direct and indirect contact with animals; preventing influenza transmission poses a special problem because the virus can be spread through aerosols. In addition, influenza viruses are unpredictable -- the strains in circulation and their impact vary by year.

Minimizing transmission of zoonotic influenza viruses and enteric pathogens requires a close collaboration between animal health officials, fair boards and managers, fair veterinarians, youth exhibitors, leaders of youth agricultural organizations, and public health officials. It's critical for youth exhibitors, their parents, and club leaders to understand the mechanisms of disease transmission at fairs and other animal contact venues, and their role and responsibility in minimizing transmission between animals and bidirectionally between people and animals. (NASAHO/NASPHV 2016*). This will require a major and sustained educational effort and culture change, as youth agricultural education in the past has focused on good animal husbandry practices and showmanship.

Minnesota has a long history of state agencies coming together with industry, academia, and private groups to manage difficult problems and accomplish great things. Keeping the public safe around farm animals without diminishing the experience and at the same time respecting the knowledge and culture of the state's animal agriculture community is a complex challenge. Working with youth agricultural organizations such as 4-H to build relationships and increase awareness starting at a young age lays the foundation for tackling this challenge. Projects funded last year in part through this grant (such as the 4-H Zoonoses Curriculum and 4-H Career day) required us to collaborate closely with 4-H educators and helped us to build the relationships necessary to make significant progress this year.

* http://nasphv.org/Documents/Influenza_Transmission_at_Swine_Exhibitions_2016.pdf

Resources:

MDH, Minnesota Board of Animal Health (MNBAH), and Minnesota 4-H possess a wealth of resources that can be leveraged for this project.

The Zoonotic Diseases Unit (ZDU) at MDH is led by Dr. Joni Scheftel, Minnesota State Public Health Veterinarian, and includes five epidemiologists (two of which are veterinarians), and one Health Program Representative (a veterinary technician). MDH's large Communications and Administrative Services Section is experienced in developing materials for an agricultural audience (see *Stay Healthy on the Farm* visitor handout, *Get your flu shot* for poultry and swine producers, and the *Agritourism Checklist* below).

The Executive Director of the MNBAH is State Veterinarian Dr. Beth Thompson, who leads a group of 13 veterinarians and 32 support staff. The MNBAH has regulatory authority over the health of Minnesota's domestic animals including oversight of the activities of poultry distributors, sales barns, and county fairs in the state. MNBAH requires that every Minnesota fair secure a fair veterinarian, who is responsible for compliance with Minnesota laws and rules. The official fair veterinarian and manager duties include monitoring the official identification and health of the exhibited animals, and working with all exhibitors on biosecurity. Much of the field work of the MNBAH is carried out by eight District Veterinarians and five agriculture advisors, with the assistance of USDA veterinarians and technicians. The MNBAH has assisted with planning and presenting our *Healthy Fairs Workshops*, and other outreach to the agricultural community. ZDU has strong working relationships with MNBAH and there is a long history of communication, collaboration, and trust. MDH is co-located in the same building with MNBAH, which facilitates surveillance for rabies, blastomycosis, canine brucellosis, Q fever, psittacosis, and several other zoonotic diseases in Minnesota for which there are blended human/animal systems that require MDH and MNBAH to work closely together.

Dr. Dorothy Freeman leads the Extension Center for Youth Development, which is part of the University of Minnesota Extension Service. Within the Center for Youth Development is the statewide 4-H program, for which Dorothy serves as director. Minnesota 4-H is the largest youth development program in the state, delivering educational programming and volunteer opportunities in every county across the state.

4-H's research-based curriculum and learn-by-doing approach is delivered by experienced youth development staff and more than 11,000 volunteers to annually help more than 71,000 Minnesota youth develop essential, transferrable skills they will use throughout their lives. Major areas of focus include: science, engineering and technology, citizenship and leadership, healthy living, expressive arts, and animal science. Participants include children from all areas of the state, both rural and urban (22% from farms, 42% from a rural town of less than 10,000 population, and 27% from towns between 10,000 and 50,000 population). Part of 4-H's mission is to reach new groups of youth in rural, suburban, urban, and tribal communities. One of 4-H's core strengths is its volunteers. In 2012, more than 10,400 adult volunteers contributed more than 960,000 hours of service to support the positive development of Minnesota's youth. Volunteers also tend to commit to volunteering with 4-H for several years; some have been volunteering for over five decades. Through consultations with the Minnesota State Fair Miracle of Birth Center, H3N2v at the fair in 2013, working together last year on a 4-H Career day, development of an educational board game, and co-organizing an *Emerging Issues Breakfast* that involved 31 agencies or entities, MDH ZDU has built strong working relationships with 4-H.

Surveillance for all zoonotic pathogens is centralized at MDH, rather than being controlled by local health departments. This is an uncommon model among states and one that facilitates consistency in data collection and timely investigation of outbreaks. MDH has a nationally recognized, state-of-the-art public health laboratory (MDH-PHL) that conducts the sophisticated testing necessary for detection and characterization of established and emerging pathogens in support of outbreak or case investigations. The MDH-PHL is co-located with MDH epidemiologists, and there is constant communication and synergy between our two groups. Strong laboratory support allows the ZDU to perform animal and environmental testing as part of outbreak investigations whenever possible. This allows us to connect the animal(s) and their environment to the ill people with just a few cases, to convincingly show causation and more effectively promote prevention measures.

Since 2011, MDH has been a part of the Upper Midwest Agricultural Safety and Health Center (UMASH) housed at the University of Minnesota. MDH's UMASH project focuses on surveillance of zoonotic diseases in agricultural workers and their families in Minnesota and outreach to the agricultural sector. UMASH resources, expertise, and personnel will be leveraged for this project (umash.umn.edu).

The importance of these relationships cannot be overstated; our strong collaborative spirit and longstanding relationships with diverse partners are the most important reasons that MDH is often at the forefront of addressing emerging disease issues, and does so using innovative approaches that are frequently models for the nation. As part of the Minnesota response to the 2015 HPAI H5N2 outbreak, MDH epidemiologists worked with state animal agency partners and the poultry industry to interview and monitor 379 exposed poultry workers from 104 affected farms. The MDH-PHL tested 15 exposed poultry workers who had symptoms compatible with influenza (all were negative). More recently, using current grant funds, MDH hosted an *Emerging Issues Breakfast* for people working at the intersection of animal health and human health. Each agencies or entity was given five minutes to talk about important issues they had dealt with in the past year and the projects their agency or organization were working on, in order to uncover opportunities for collaboration or shared resources. The 3-hour breakfast meeting included 64 participants from 31 different entities.

In 2013, MDH, in cooperation with MNBAH, applied for a pilot grant through UMASH to begin *Healthy Fairs* Workshops that use a One Health model for county fair health and safety, covering environmental health issues such as fresh and waste water, new animal health and exhibition issues and human health issues. They are co-hosted by MNBAH, MDH ZDU staff, and MDH Environmental Health staff. These workshops have been offered in five different greater Minnesota locations and were given free of charge. Funding received for this grant last year paid for one of these *Healthy Fairs* Workshops. Participants include county fair board members, fair show supervisors, fair veterinarians, extension educators, 4-H, FFA, private petting zoo owners, and animal and public health officials. In total, 140 people have attended the workshops. The ZDU has developed strong relationships with the Minnesota Federation of County Fairs (MFCF) and other agricultural sector partners through workshops and presentations at their past six annual meetings. Many of our county fair partners also work closely with 4-H and have expressed interest in developing partnerships between MDH, 4-H, and their fairs.

Have fun on the farm and stay healthy!

Even healthy, well cared for animals can have germs that can make people sick.

Keep food and drinks out of animal areas
This includes bottles, sippy cups, and pacifiers
You don't want to get germs on them

Wash your hands with soap and water
Wash hands after visiting the animals and before eating
Don't just use hand sanitizer. It doesn't work against all germs

Don't touch your mouth
That's how germs get in your body and make you sick

Wear appropriate clothing and shoes
Such as sturdy shoes and clothes you can get dirty
When you get home, change your clothes and shoes and wash them

Don't touch the farm equipment
Farm equipment can be dangerous
Stay with your group

If you are pregnant, under age 5, over age 65, or have a compromised immune system, you are at higher risk for more serious infections.

See you soon!

MDH Minnesota Department of Health
Minnesota Department of Health
Zoonotic Diseases Unit
651-201-5414 or 1-877-676-5414
www.health.state.mn.us

UMASH University of Minnesota Animal Health Service

PROTECT YOUR PIGS PROTECT YOURSELF GET YOUR FLU SHOT

MDH Minnesota Department of Health

UMASH University of Minnesota Animal Health Service

PROTECT YOUR BIRDS PROTECT YOURSELF GET YOUR FLU SHOT

MDH Minnesota Department of Health

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Animals in Public Settings -- Best Practices Checklist

The best practices described below are based on the [Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, 2013](#).

If you operate an animal contact venue, please use this checklist as a tool to design and operate your venue according to the national standards. If you are hiring a petting zoo or other animal contact business, please use this checklist to evaluate potential vendors.

Facility Design

- ☐ Handwashing stations
 - ☐ Running water
 - ☐ Accessible for children and persons with disabilities
 - ☐ Plan in place for restocking paper towels, soap, and water
- ☐ Hand sanitizer (should be used as a supplement to soap and water and does not replace soap and water for handwashing)
 - ☐ Plan in place for restocking hand sanitizer
- ☐ Petting of animals only allowed over/through barriers (fences); visitors not allowed in pens
- ☐ No physical contact by the public with chicks, ducklings, reptiles, calves, or dangerous and exotic animals (e.g., primates, wolf pups)
- ☐ No transport of manure/soiled bedding through public areas
- ☐ Transition area at entrance between non-animal and animal areas
 - ☐ Provide stroller and bag storage to keep items out of animal areas
- ☐ Transition area at exit as people leave animal space to non-animal space
 - ☐ Place handwashing stations position near exit so visitors can't miss them

Visitor Education

- ☐ Educational messages in multiple formats (e.g., signs, videos, recorded messages, stickers, bracelets, interaction of staff and visitors, etc.)
- ☐ Signage in transition area at entrance
 - ☐ Animals can carry germs that can make people sick
 - ☐ No food or drink in animal areas
 - ☐ No hand-to-mouth activities in the animal area (i.e., drinking, eating, bottles, pacifiers)
 - ☐ Children under five years old, senior citizens, pregnant women, and people with chronic health conditions or a weakened immune system should be extra careful around animals
- ☐ Signage in transition area at exit
 - ☐ Wash hands thoroughly with soap and water immediately after visiting the animals
- ☐ Staff members present to encourage safe animal contact
 - ☐ Remind visitors that animals can carry germs that make people sick
 - ☐ Remind visitors to refrain from risky activities in the animal area (i.e., drinking, eating, bottles, pacifiers)
 - ☐ Remind visitors to wash their hands after visiting the animal area
 - ☐ Remind parents to supervise children with the animals

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Methods:

The project's long-term objective is to facilitate prevention, detection, and monitoring of zoonotic diseases associated with animal agriculture, including emergent zoonotic diseases with pandemic potential, such as novel influenza strains. This project's effectiveness will be evaluated through metrics such as attendance at outreach events, number of facilities completing *Safer FACEs*, and number of 4-H clubs using our *Zoonotic Diseases* curriculum and board games.

Specific Aims:

1. Improve participant awareness and knowledge of zoonotic diseases, including zoonotic disease transmission and prevention

We propose to leverage the Zoonotic Disease Educational Toolkit created by Michigan's pilot project. Our toolkit will consist of four lessons; two developed by Michigan and two that will be developed in Minnesota. One thousand five hundred toolkits will be assembled and made available to all Minnesota 4-H clubs.

An elementary school level educational board game that was conceptualized and developed with last year's grant will be finished with this year's grant. The board game is currently under review by 4-H to ensure the content is age appropriate and to add 4-H specific elements to the game pieces. The board game will be produced by Game Crafters LLC and will be combined with a 30 minute lesson (provided on a USB key). The lesson will cover basic concepts of disease transmission and prevention for a variety of zoonotic diseases including influenza. The game and lesson will be distributed at no charge to each county 4-H office.

MDH, 4-H, and MNBAH will work together to develop an electronic *Zoonotic Diseases* curriculum covering more complicated zoonotic disease concepts for middle and high school 4-H animal project participants. In addition to discussing advanced concepts of disease transmission and prevention, the material will discuss the responsibility we all share for keeping the public, other exhibitors, and animals safe at public animal contact venues. A key point will be discussing the personal conflicts that can arise when you or your show animals are sick during fair time. A global component looking at factors influencing emergence and movement of pathogens around the world will be included and is the basis for an essay writing contest entitled, *Global events: How do they affect me and my animals?*

During the first year of funding, two educational videos were produced, one on [Agritourism Awareness](#) and one on [Handwashing](#). A third video is currently underway titled, *How to best design a public animal contact venue*. We will continue to produce short educational videos that will cover proper personal protective equipment use and specific guidelines for hosting an agritourism event at your farm.

2. Motivate participants to adopt behavior that can help prevent zoonotic disease transmission

4-H currently holds an annual *Science of Agriculture Challenge* that has become a showcase of student ingenuity. It is a hands-on learning experience to develop science-based solutions and inventions to address agriculture-related issues. In 2016, there were 70 teams registered. Youth form teams each fall and work with expert mentors to solve problems that have been identified by their communities. Past teams have worked on problems such as water quality, GPS ear tags for livestock, and overwintering bees. We will challenge teams to make an effective, portable, and affordable handwashing station. This

would be monumentally helpful for county fairs and agritourism operations. Scholarships to teams willing to take on this challenge will be provided to defray the cost of supplies.

4-H also holds a *Rube Goldberg Engineering Design Challenge*. Participants apply their science, technology, and engineering and mathematics (STEM) knowledge to solve problems by identifying and researching them, then making and implementing a plan to design a solution. These challenges take place at county fairs each year and are open to 3rd through 8th graders. We propose to present the 2018 challenge as: feed an animal without touching it. This challenge would provide owners and operators of public animal contact venues an entertaining and safe way to allow visitors to feed their animals. Again, we would provide scholarships to help defray the cost of supplies.

This grant will leverage agritourism work being done in cooperation with UMASH. Agritourism [educational materials](#) and videos have been developed, which will be expanded upon and shared with 4-H participants. Agritourism Workshops will continue to be offered and 4-H staff will help advertise and promote these workshops, which will be co-hosted by MNBAH, Minnesota Department of Agriculture (MDA), and MDH Environmental Health. These workshops contain a mixture of lecture time, “ask the expert” time, and group time to share experiences and lessons learned operating agritourism venues.

In the past year, a 2-hour web-based voluntary certification program called *Safer FACES* (Safer Farm Animal Contact Exhibits) was developed. The program targets county, regional, and state fairs, agritourism operations, petting zoos, educational camps, 4-H and FFA leaders and educators, and older 4-H participants. The program is slide-based with pictures and diagrams, cautionary tales, and quiz questions interspersed throughout. *Safer FACES* was piloted during the MFCF Annual Meeting in January 2017, where we received valuable feedback. When training is completed, participants are certified by MDH as having completed the training.

The next phase of this project is a marketing campaign for *Safer FACES* to raise operator and public awareness of the certification and training program. The success of the program depends on effective branding that creates intrinsic value. If members of the public, including parents, seek out certified venues, this will drive operators to the certification program. Part of the marketing campaign will involve boosted Facebook posts, Twitter posts, advertising through 4-H communications, and advertisements through Minnesota Grown and other agriculture journals and local newspapers.

3. Increase participant awareness and knowledge of careers in public and animal health

Since its inception two years ago, over 200 4-H participants have attended the *Ag Career Day* at the University of Minnesota. In 2017, MDH co-hosted and participated in the event, and we propose to continue doing so. Students engage in learning around a variety of Ag careers, hear from industry experts, participate in a panel discussion with college students currently enrolled in Ag programs, and gain a better understanding of the possibilities for their future careers in agriculture-related fields. Parents also have an opportunity to participate in a financial planning workshop.

In addition, we propose to add an additional career day event called, *One Health Career Exploration Day* that focuses on government and public service jobs. This event will occur in the fall on a day when school is out of session. High school students participating in a 4-H livestock project can apply to attend

the day. Up to 40 participants will be selected. The day will include visits to the Department of Natural Resources, MDH, MDH-PHL, MNBAH, MDA, and the United States Department of Agriculture-Veterinary Services. This day will expose those selected to a wide variety of human and animal health careers that exist in the government. Lunch and transportation by bus between the different agencies will be included.

4. Facilitate a better understanding among participants of the role public and animal health play in disease prevention

We propose a mentoring program that would pair 4-H participants with professionals working at the human-animal interface. Geographic proximity would not be required, thus allowing 4-Hers from all over Minnesota to participate in the mentoring program. We will seek mentors in both the public and private sector from among our partner contacts. 4-H students in their Junior or Senior year of high school will be eligible to apply. Both mentors and mentees will complete an application process that will facilitate the proper matching of mentors and mentees. 4-H will perform a background check on mentors as they do for all adult volunteers. A committee of MDH and 4-H members will review mentor and mentee applications and hand match pairs. There will be an in-person (or via WebEx) kickoff event for the program and an end of the year party to celebrate the mentoring program, which will last for one school year, beginning in September and ending in June. Throughout the year, participants may choose to meet in person for a “shadowing day,” correspond over email, or have meetings by phone. Resources will be provided to both mentors and mentees including a guide, discussion questions for mentor pairs, and a mentor program conversations calendar. By participating in the mentor program, 4-Hers can grow to understand which type of higher education and future major would best help them achieve their goals.

The *Zoonotic Diseases* curriculum from Aim 1 will empower each 4-H participant to truly be a one health ambassador. As they learn the principles of zoonotic disease transmission and prevention, they will be able to teach what they have learned to others. They can take these lessons back to their home farms, friends and families, and also to the people who visit their animals at the county and state fairs. In addition to teaching visitors about animal welfare and husbandry, they can teach zoonotic disease concepts including how to prevent people and animals from getting sick from each other. They can remind visitors to wash their hands and keep food and drink out of the animal barns. These ambassadors can promote the health not only of their animals, but also of the people visiting their animals.

5. Develop relationships among stakeholders that could be used to facilitate more effective and efficient responses to important public and animal health issues (e.g. the response to infectious disease outbreaks or epidemics)

Last year we piloted an annual *Emerging Issues Breakfast*, which was an open forum including 64 people from 31 different public agencies and entities that work at the intersection of human health and animal health. This meeting provided a space for everyone to get to know each other and to give updates on what is going on in their part of the world. Attendees from MNBAH, MDH, MDA, DNR, Minnesota Pollution Control Agency, USDA, 4-H, FFA, Minnesota State Fair, the MFCF, Minnesota Milk, Minnesota Beef Council, Minnesota Farm Bureau, and others talked about issues they had dealt with in the past year and current projects. This breakfast was so successful that we plan to continue them on a regular basis. Based on our attendee survey, most respondents wanted the *Emerging Issues Breakfast* to occur two times each year and several agencies were willing to take turns “hosting” the breakfast

meeting. We believe this has the potential to become a stable, long term event in Minnesota that will help us all work better and more efficiently together.

Two *Agritourism Workshops* will be planned, advertised, and hosted for people engaged in this growing endeavor. These workshops are a collaboration between the MNBAH, MDA, MDH Environmental Health Division, MDH ZDU, and 4-H. Many 4-H families own farms and are interested in getting into agritourism to supplement their farm income with agritourism income. Each attendee will receive an educational binder along with hand-washing and other posters that can be used at their facility. Past workshops have served to build strong partnerships between state agencies and venue operators. The *Healthy Fairs* and *Agritourism Workshops* outreach events have been the most effective thing we do to build relationships among the agricultural sector. Many times an outbreak investigation of an animal venue has led to an invitation by that venue to meet with them to discuss what happened and how it can be prevented in the future. We have met at the venue site and presented the outbreak report, answered any questions, and consulted on the placement of handwashing sinks, manure handling protocols, and other management changes to minimize risk.

6. Foster inter-state collaboration around youth zoonotic disease education and outbreak response efforts with the goal of creating a sustainable regional and national partnership network to implement this work.

As part of our effort to foster inter-state collaboration around youth zoonotic disease education and outbreak response efforts we plan to assemble a “how to” guide for other states in the Midwest to organize and hold their own *Emerging Issues Breakfasts*. Fostering collaboration between agencies, organizations and Ag commodity groups in other states is advantageous for everyone. Relationships formed during these meetings will strengthen the region’s ability to work together, be flexible, and rapidly respond to emerging zoonotic disease threats.

We have already begun collaborating with Julie Thelen from the Michigan State University Extension Services regarding the Zoonotic Educational Toolkit they have developed. Julie was happy to share her toolkit and their cost estimates to produce the kits. Future discussion will include permissions to add the appropriate MDH and 4-H logos to the materials already developed by Michigan. We plan to develop two lessons in-house and will share those lessons with Michigan and other pilot sites.

We also plan to start conversations with the other pilot sites in the Midwest to explore the idea of an inter-state, friendly competition between 4-Hers with the *Engineering Design Challenge: Rube Goldberg* project and the *Science of Agriculture Challenge*. We will discuss how these events can be started in other states, or if the projects are currently in existence, then the possibility for a remote competition using technology to bring the competitors and judges together.