



Zoonotic Diseases Lesson

Not All That Glitters is Gold; Sometimes it's GERMS!

Preparation

Time

Set up: 10 minutes

Activities: 10–15 minutes each

Skill level

Intermediate/advanced

Objective

Participants will be able to understand and demonstrate proper cleaning and disinfection techniques. These skills are necessary for a successful biosecurity plan that minimizes the risk of disease spread.

Supplies

- Glitter Bug kits, containing Glitter Bug powder and/or Glitter Bug gel and UV light/black light
- Feed pans, show whips or other show supplies
- Two pails/wash tubs or a sink big enough to wash feed pans and other items (one used for cleaning and the other used for disinfection of item)
- Water source (for cleaning items)
- Brush (for scrubbing during cleaning process)
- Soap (dish soap can be used during cleaning process)
- Disinfectant - any one of the effective disinfectants listed below
 - Accelerated hydrogen peroxide (preferred)
 - Synergize*
 - Virkon S*
 - Tek-Trol*
 - 1Stroke Environ*
 - Clorox*

* If you are using these products, please follow the label directions to properly mix the solution and what type of personal protective equipment (PPE) to use. Some examples of PPE are gloves, facemasks, and coveralls.

Vocabulary

Viruses and bacteria – germs that cause illness in animals and humans

Pathogen – a disease-causing agent or germ, such as a virus, bacteria, or other microorganism

Biosecurity – steps taken to prevent the spread of pathogens and keep humans and animals healthy

Zoonotic diseases – diseases that can be shared between animals and humans

Contaminate – to make something dirty by exposing it to germs

Background

Pathogens are found in manure and bedding, which can contaminate items brought to livestock shows/exhibitions (e.g., show supplies, equipment, facilities, trailers, boots and clothing). Cleaning and disinfection of these items can help stop the spread of pathogens and therefore should be a top priority in your biosecurity plan.

Cleaning, which involves the removal of all dirt and organic matter, needs to be completed before disinfection can be effective. Organic matter stops disinfectants from working.

It is important for disinfectants to remain on surfaces for the time specified on the label (called contact time). This is the final step and kills any remaining germs.

How and what needs to be cleaned and disinfected

Clothing

Clean clothes should be worn when working with animals and then changed when finished. This helps reduce the risk of pathogen transfer from the fair to your home. Fair clothes should be bagged and emptied right into the washing machine. Clothes can be washed normally with laundry detergent in the washing machine and should be dried on high heat in the dryer.

Boots

Boots should be cleaned and disinfected before going to the fair and prior to bringing them home. This helps reduce the risk of bringing pathogens from one site to the next. Boots should be cleaned and disinfected through the process of proper cleaning and disinfection outlined in this lesson. If disposable boots are used, they should be thrown away promptly after use. Ideally, each person would have a pair of boots for fair use and another for farm use.

Equipment, facilities, supplies, and trailers

All things that were in contact with animals, either prior to, during, or after the fair should be thoroughly cleaned and disinfected using the process of proper cleaning and disinfection outlined in this lesson.

Proper cleaning and disinfection process

Equipment and supplies should be cleaned and disinfected at the site of use or contained for transport to the site of cleaning. NEVER bring soiled equipment or supplies to another farm or animal site before they have been cleaned and disinfected. If there are cuts/open wounds on your hands or arms, they need to be covered with sleeves or gloves prior to cleaning and disinfection. Long pants should also be worn.

1. Wash equipment/supplies with hot water to remove all organic matter. Organic matter includes manure, shavings, straw, etc. Avoid splashing/spraying into your mouth or eyes.
2. Use soap/detergent and a brush for scrubbing to help with the removal of organic matter.
3. Rinse with water.
4. Repeat steps 1–3 until equipment/supplies are free of any visible manure or other organic matter.
5. Wash hands with soap and water and then put gloves on before starting the disinfection process.
6. Disinfect equipment/supplies so all surfaces are thoroughly wet. Use one of the effective disinfectants (listed on page 1) according to label directions with the correct concentration and proper contact time.
7. Rinse and allow equipment/supplies to air-dry completely prior to the next use.

Use Swiffer wipes to test for cleanliness. If Swiffer wipes are soiled after wiping the equipment and supplies, the items are still dirty and steps 1–6 should be repeated.

Pre-activity questions

1. Do you think you can see pathogens on your clothes? Hands? Shoes?
2. What are some ways pathogens can be spread?
3. What do you currently do to clean your equipment?

Explain

We are going to do an experiment that demonstrates how disease-causing pathogens are invisible and can easily spread with poor biosecurity practices.

Activity

Prior to the exercise, place some Glitter Bug powder on the floor/ground so participants walk through it.

Part 1

1. Choose some youth to walk outside or into another room.
2. Ask the youth if they think transmission of pathogens happened by walking from one area to the next.
3. Shine the black light on the floor/ground where the youth walked through the Glitter Bug powder and tracked it other places with their shoes. The Glitter Bug residue should glow on the floor where they walked. This demonstrates how germs can be transferred on our shoes or clothing without visibly seeing we are tracking germs around. (Note if this is done outside, concrete ground surface will work better than grass or gravel.)
OR
1. Put Glitter Bug powder on the bottom of the shoes of some of the youth and have them walk to other areas of the room. (Note if this is done outside, concrete will work best for youth to walk on.)
2. Ask the youth if they think transmission of pathogens happened by them knowingly walking around with Glitter Bug on the bottom of their shoes. Remind youth the Glitter Bug is similar to if they walked around with manure, urine, or any other contaminated substance on their shoes.

3. Shine the black light on the floor/ground where the youth walked. The Glitter Bug residue should glow on the floor where they walked. This demonstrates how pathogens can be transferred on our shoes or clothing without us visibly seeing we are tracking pathogens around.

Part 2

(Note: this activity could be done by putting Glitter Bug on participants' hands and having them rub their hands together. Then, having participants wash their hands to see how well they did getting rid of contaminants by examining their hands under a black light. It could also be used on livestock exhibition equipment items to illustrate contamination and appropriate clean up practices)

1. Rub Glitter Bug on a feed pan, show whip, or other show supplies you have access to and shine the black light on the item to show the youth the item is contaminated with a pathogen. Areas that glow indicate areas that are contaminated with pathogens.
2. Clean the item with just water (best not to use a brush, or if used, don't use it to scrub vigorously).
3. Ask youth if they think the item got cleaned by only using water.
4. Shine the black light on the item. It should glow where the Glitter Bug was applied. This demonstrates that cleaning with water alone does remove all pathogens.
5. Clean and disinfect the item using the Proper Cleaning and Disinfection process outlined earlier in this lesson.
6. Ask the youth if they think the item got thoroughly cleaned and disinfected this time.
7. Shine the black light on the item. If there is still Glitter Bug residue on the item, those areas will glow and show the item still isn't clean and is carrying pathogens.
8. Repeat the cleaning and disinfection process until all Glitter Bug has been removed and residue doesn't glow under the black light. This will demonstrate the importance of proper cleaning and disinfection to remove and kill pathogens.

Process

1. Did it take more or less scrubbing than you thought to get rid of the pathogens?
2. What were some of the areas where it seemed hardest to get rid of the pathogens?

Expand

1. What other ways do you think pathogens can spread?
2. What precautions can you take to prevent disease transmission between animals? Animals and humans?
3. How will this change the way you currently clean your equipment?

Resources

- *A Champion's Guide to Youth Swine Exhibition: Biosecurity and your pig project.* National Pork Board and American Association of Swine Veterinarians. 2013.
- Masker, C. *Biosecurity for Youth.* Pork Information Gateway. 2012.
- *Porcine Epidemic Diarrhea Virus (PEDV).* U of MN Center for Animal Health and Food Safety. 2013
- *Porcine Epidemic Diarrhea Virus (PEDV) – What Is It?* National Pork Board. 2013.

- *Youth PQA Plus manual*. National Pork Board, 2014, ed.
- <http://www.nasphv.org/Documents/AnimalContactCompendium2017.pdf>
- <http://umash.umn.edu/wp-content/uploads/2017/06/Animals-in-Public-Settings-Best-Practices-Checklist-2017.pdf>

Questions and comments

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