



Biosecurity Learning Modules Teaching Guide

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Certificate of Achievement – download and print from the Teaching Resources tab at: https://www.healthyagriculture.org/training/youth-4h-ffa/biosecurity-learning-modules/	
Learning Module Screenshots – download and print from the Teaching Resources tab.	

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Visit <https://agbiosecurityproject.org/about-adbcap/collaborators/> for team biographies.

The Biosecurity series of modules was developed by a small but dedicated group of individuals who identified and designed the content and activities for the modules: Jeannette McDonald, team leader and distance educator from Wisconsin; Susan Kerr, livestock Extension specialist and 4-H educator; Jeanne Rankin, animal health disaster preparedness and response specialist and cattle producer. Julie Smith, grant project director, participated as time permitted. Tommy Bass, Extension agricultural education and animal and range scientist, was the impetus behind, and a major contributor to, this teacher's guide. Rebecca Sero, evaluation specialist, published, collected, and collated the formative evaluation tools and designed summative evaluation tools to collect impact data.

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Welcome to the biosecurity series of learning modules for youth, funded by a grant from the USDA National Institute of Food and Agriculture. We focused our educational efforts on youth to stimulate “trickle up” education.

Research supports the concept that instilling the importance and habits of biosecurity in youth will help with the adoption of these habits by adults. Our goal is to create a new culture of biosecurity advocates for biosecure farms. To this end, our last module in the series teaches youth how to prepare and deliver presentations in support of their roles as biosecurity advocates.

Guiding Teaching Philosophy: Discovery Learning

We’d like to share a little of our teaching style in these modules. We use what we call “discovery learning”. Students are presented with questions or tasks to complete to which they probably do not know the answers. They are given supplemental information to inform their answers and the students make their best guesses.

Students are not penalized for incorrect answers and are given immediate feedback as they progress through the pages of the modules. This helps students interact with and think about the content instead of just scanning it.

We also wanted to introduce scientific terms to students. We don’t expect them to know terms and diseases in advance. Activities have hints and explanations to help students complete them. Our goal for the modules is NOT to create veterinarians, but instead to create knowledgeable students and advocates for biosecure agricultural communities.

Technology Requirements

The learning modules require a desktop Mac or PC computer/laptop. They are not designed for smartphones or tablets. Some features will work on smartphones and tablets, but not all.

The modules will not expand to full screen. Use the web browser zoom in-or-out options to enlarge or reduce the screen size, and/or click the F11 keyboard button to remove the browser navigation bar at the top of the screen.

Finally, we highly recommended that a printer be available for printing worksheets and summaries. This is especially true for the final module where students will be creating their own presentations.

To view the learning modules, go to:

<https://www.healthyagriculture.org/training/youth-4h-ffa/biosecurity-learning-modules/>

Overview of the Series

Learning Module	Grade Level			
	3-5	6-8	9-12	>12
<p>1. What is Animal Biosecurity? Why should we care?</p>  <p>The first module introduces the concept of biosecurity: what it means; why it's important; how a disease agent, the host, and the environment all contribute to the development of disease; and that we might be able to prevent the spread of diseases by altering one or all of these factors.</p>	With leader/teacher	X	X	X
<p>2. Biosecurity: Routes of Infection and Means of Transmission</p>  <p>The second module explores the various routes of infection and ways diseases can be transmitted between animals and animals, and animals and humans.</p>	With leader/teacher	X	X	X
<p>3. Biosecurity: Finding Sources of Disease Transmission Risk</p>  <p>The third module puts the student in the role of a "Biosecurity Inspector" who tours a dairy farm and creates a report of potential sources of disease transmission they find. Students are introduced to the different types of disease transmission sources while visiting different areas.</p>	With leader/teacher	X	X	X
<p>4. Biosecurity Strategies</p>  <p>The fourth module has the student as Biosecurity Inspector creating a biosecurity management plan by identifying strategies to decrease risks of disease transmission previously found on the farm and recommending those most cost effective.</p>	With leader/teacher	X	X	X
<p>5. Public Speaking for Biosecurity Advocates I: Creating a Persuasive Presentation</p>  <p>This module follows Charley as she creates a presentation, including evaluating sources, with the student simultaneously creating their own.</p>	With leader/teacher	X	X	X
<p>6. Public Speaking for Biosecurity Advocates II</p>  <p>In this final module students are coached, along with Charley, in how to use verbal and non-verbal communication techniques to deliver a dynamic and persuasive speech.</p>	With leader/teacher	X	X	X

Correlation of Learning Module Objectives with FFA Curriculum Content Standards

(AFNR) Career Cluster Content Standards	Module				
	1	2	3	4	5/6
AS.07. Apply principles of effective animal health care. (publication section pages 11-12)					
AS.07.01. Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare.	X	X		X	
AS.07.01.04.a. Identify and summarize characteristics of causal agents and vectors of diseases and disorders in animals.					
AS.07.01.04.b. Research and analyze data to evaluate preventive measures for controlling and limiting the spread of diseases, parasites and disorders among animals.			X	X	
AS.07.01.04.c. Design and implement a health maintenance and a disease and disorder prevention plan for animals in their natural and/or confined environments.			X	X	
AS.07.02. Analyze biosecurity measures utilized to protect the welfare of animals on a local, state, national and global level.					
AS.07.02.01.a. Summarize the importance of biosecurity to the animal industry at multiple levels (e.g., local, state, national, global).	X				
AS.07.02.01.c. Design and evaluate a biosecurity plan for an animal production operation.			X	X	
AS.07.02.02.c. Research & evaluate the effectiveness of zoonotic disease prevention methods & procedures to identify those that are best suited to ensure public safety & animal welfare.	X				
CRP.04. Communicate clearly, effectively and with reason. (publication section pages 6-8)					
CRP.04.01. Speak using strategies that ensure clarity, logic, purpose and professionalism in formal and informal settings.					X
CRP.04.01.01.a. Identify and categorize strategies for ensuring clarity, logic, purpose and professionalism in verbal and non-verbal communication (e.g., vocal tone, organization of thoughts, eye contact, preparation, etc.).					
CRP.05. Consider the environmental, social and economic impacts of decisions. (pub. section pages 8-9)					
CRP.05.02. Make, defend and evaluate decisions at work and in the community using information about the potential environmental, social & economic impacts.			X	X	
CRP.06. Demonstrate creativity and innovation. (publication section pages 9-10)					
CRP.06.01. Synthesize information, knowledge and experience to generate original ideas and challenge assumptions in the workplace and community.			X	X	X
CRP.06.02. Assess a variety of workplace and community situations to identify ways to add value and improve the efficiency of processes and procedure			X	X	
CRP.06.03. Create and execute a plan of action to act upon new ideas and introduce innovations to workplace and community organizations.			X	X	
CRP.06.03.01.a. Examine workplace and community situations to identify opportunities for improvement through the introduction of new ideas and innovations.					
CRP.06.03.01.b. Assess and communicate the risks and benefits of applying new ideas and innovations to the workplace and community.					X
CRP.06.03.01.c. Design a plan of action to introduce a new idea or innovation into the workplace and community.				X	

Supplemental Teaching Ideas

We have provided a list of supplemental learning activities for modules 1-4, should you want more. The list is large because we wanted to give you lots of ideas to choose from.

There are ideas for general activities you can use to introduce the concept of biosecurity, or as capstone activities. There is also a list of ideas for each module related to specific activities or slides within that module. It is best to go through the module and check out the idea in relation to its activity or slide in the module. Some of the ideas are self-explanatory, and some ideas have a web link for more information, or the detailed directions are provided in this teaching guide.

We didn't assign grade or age levels to activities due to a wide variety of abilities, knowledge, and experience children may have. You and/or the child can determine if a beginner, intermediate, or advanced activity is the best choice.

In keeping with our philosophy of discovery learning, there are many ideas that have students looking for more information. The Internet is a great resource but requires caution and safety measures to get to the best information. Students should follow the teacher's, 4-H leader's, or parent's rules about Internet use.

To weed out bad or false information when researching biosecurity or animal health, consider adding the words "Extension," "university," "USDA," or "4-H" to your search terms. For example, search "biosecurity 4-H" or "PEDv USDA." While doing general research, look for sources that are from a government agency, university, respected agricultural organization, or veterinary association. Older students or club members may search Google Scholar for scientific articles, though the text may be dense and hard to interpret.

General Activity Ideas

● = Explore ○ = Apply B = Beginner I = Intermediate A = Advanced	B	I	A
Lab Kits (in class exercises, demonstrations, activities)			
Fun with Feet and Fomites	●	X	X
Michigan State University paper bag exercise - https://www.canr.msu.edu/uploads/236/65684/4H1661_AnimalScienceAnywhere-Biosecurity.pdf	●	X	X
SCRUB Kits (see table below)	●	X	X
Dart Board Game			
Class Discussions/Debates			
Why is animal health (and biosecurity) important? What observations have students ever made of pets or farm animals that were sick or suspected to be?	○	X	X
Is practicing biosecurity on a farm or ranch a moral duty to protect the farm family, community, and industry from disease outbreak, and to promote animal welfare?	○		X
Defend one of the following positions. Biosecurity is better promoted through: a) government incentives (payments or tax credits), b) government regulations (rules and laws), c) agricultural industry incentives by commodity organizations/trade associations, or d) completely voluntary.	○		X
Questions or debate topics about risk perception and decision making.	○		X
Risks and rewards of vaccination for herd health.	●		X
Short Project or Mini-Research Ideas/Topics			
Observe and journal (write and/or draw) about a pet's or farm animal's environment (home, yard, pen, coop, pasture), diet, behavior, interactions with other animals, and overall health for 1-2 weeks. This could be done before or after the biosecurity lessons (before, observations will be brought into discussion; after, observations are more focused relative to completed LOs).	● ○	X	X
Research a common animal or zoonotic disease for a species (animal) that interests you and complete a one-page report. Report format can be like a fact sheet with disease name, species impacted, locations active, disease transmission/routes of infection, biosecurity strategies.	● ○		X
Research a largely eradicated animal or zoonotic disease and complete a one-page report. Report format can be like a fact sheet with disease name, species impacted, locations active/locations eradicated, disease transmission/routes of infection, biosecurity strategies.	● ○		X
Research a career where biosecurity and animal health may be an important knowledge set and complete a one-page report. Report format can be like a fact sheet with career/job name, duties or activities, places where people have this job, why biosecurity is important to the job.	●		X
Science Fair Project Ideas			
Compare bacterial counts from not washed/rinsed/well washed hands	●		X
Compare effectiveness of different disinfecting agents	●		X
Observe how many times subjects touch their nose, mouth, hair, compare within demographics	●		X
How good a hand-washer are you? Using Glo Germ™, check before and after training.	○	X	X

Fun with Feet and Fomites

by Dr. Susan Kerr, WSU NW Regional Livestock and Dairy Extension Specialist

Activity I

Intended Audience

- 4-H livestock project youth and leaders with application to other audiences.

Materials Needed

- Glo Germ™ powder and lotion
- Hand-held black light
- Handouts on biosecurity

Steps

1. Plan a meeting to discuss biosecurity or another livestock health topic. Select a room that will be very dark when the lights are turned out.
2. Before participants arrive, sprinkle Glo Germ™ powder on the floor where people will enter the room and apply Glo Germ™ lotion to your hands.
3. As participants arrive, shake hands and/or place a hand on their shoulder to welcome them. Distribute handouts (can use page 2 of this activity for the handout).
4. Give presentation on biosecurity using the format of your choice (PowerPoint, Q&A, panel discussion, lecture, etc.).
5. After the presentation is over, tell the audience you now have a special presentation for them. Turn off the lights, turn on the hand-held black light, and traverse the room looking for areas that glow, which simulate the location of an infectious disease organism. Focus on the floor where “infected” shoes walked, people’s hands, handouts, tables, doorknobs, drinking cups, etc.

Debrief

1. What did people observe?
2. How did the “germ” get so widely distributed?
3. What pathogens (disease-causing organisms) could be transmitted like this?
4. What does this tell us about routine biosecurity efforts we should practice?
5. What additional ways do livestock spread diseases to each other?

Fun with Feet and Fomites: Activity 2

Creating a Farm Biosecurity Plan

Biosecurity plans include actions taken to reduce the introduction and/or spread of disease-causing agents on farms. Each farm's plan needs to address risks and resources specific to the farm.

Areas of Risk Include:

1. People (owners, employees, vendors, visitors)
 - a. Do not employ people who own the same species of livestock as on the farm.
 - b. Educate and train employees and family members about biosecurity principles.
 - c. Control farm visitors; use signage to restrict access to farm and livestock areas.
 - d. Require visitors and farm service providers to wear disinfected footwear and clean clothing.
 - e. Do not allow sick people to have contact with livestock or poultry.
 - f. Have separate caretakers for healthy vs. sick vs. quarantined animals.
 - g. Have visitors sign a logbook with their name and contact information.

2. Animals (herd/flock additions, animals returning from exhibition or breeders, wildlife, neighboring animals, feral animals)
 - a. Obtain new animals from low-risk sources.
 - b. Conduct pre-purchase laboratory testing and physical examinations.
 - c. Locate quarantine facilities >150' downwind and downstream from main facility.
 - d. Quarantine new/returning animals for 30 d. minimum.
 - e. Do young and healthy animal chores before those of older or sick animals.
 - f. After weaning, separate animals by age.
 - g. Prevent contact between sheep and cattle.
 - h. Prevent contact between poultry and swine.
 - i. Monitor animal health daily.
 - j. Isolate sick animals in hospital area.
 - k. Create vaccination program in consultation with veterinarian.
 - l. Use fencing to prevent contact with neighboring animals, groups of animals, or passing traffic.
 - m. Cull chronic "poor do-ers."
 - n. Remove and bury, landfill, or compost dead animals promptly.

3. Vehicles and equipment
 - a. Have separate equipment for feed and manure handling.
 - b. Do not share equipment with or borrow from neighbors unless disinfected before and after use.
 - c. Consider traffic flow; prevent overlap with animal feeding and housing areas. Restrict visitor parking to designated area away from livestock housing/feeding areas, preferably on concrete or gravel.

Fun with Feet and Fomites: Activity 2, continued

4. Feed/water
 - a. Consider water quality and prevent upstream contamination.
 - b. Obtain feed from trusted source.
 - c. Prevent contamination with feces, mud, water, vermin, etc.

5. Vermin, flies, wildlife
 - a. Control rodents, insects, and wildlife by fencing, manure control, sprays, etc.
 - b. Maintain litter boxes in barns for cats; prevent feral cats/kittens by spay/neuter.
 - c. Use netting to prevent birds from roosting in rafters.

6. Facilities
 - a. Establish dis-infectable surfaces such as metal and concrete vs. wood and dirt.
 - b. Ensure effective ventilation to decrease respiratory disease risk.
 - c. Provide adequate space to prevent livestock overcrowding.

7. Sanitation
 - a. Remove and compost manure in a timely fashion.
 - b. Use effective cleaning and disinfection protocols.
 - c. Establish and use handwashing facilities.
 - d. Change gloves and wash hands between handling groups of animals.
 - e. Provide coveralls and disinfected footwear for visitors.
 - f. Do not feed animals directly on ground.
 - g. Establish "line of separation" between "clean" and "dirty" areas of farm and facilities; do not let anyone cross line unless dirty clothing/footwear left on dirty side and clean clothing/footwear donned for clean side.

Dartboard Game

This is a very flexible activity. After understanding the basic concept, it can be revised and used in many ways again and again to focus on different aspects of biosecurity or other animal health topics. It can be a fun way for youth to learn new terminology, actively interact with new knowledge, and make new concepts memorable.

Get or make a dartboard that will use magnetic or Velcro® darts, such as the one shown below. The board should have at least four different colors and many different segments, each with a number inside or a number coded to the segment's color. The numbers could be pre-printed on a manufactured dartboard, determined by participating youth, or changed for each game.



Get four small boxes and write the color of one of the dartboard colored segments on each (e.g. blue, yellow, red, green). On slips of paper, write examples of disease names; disease agents; how diseases are transmitted; and prevention actions (see examples in table below). If desired and more colors are present, include more parameters such as species affected, signs of illness, etc.

Additional colors could also be “wildcard” values and cause the loss of all points already earned, double points, loss of a turn, award of an additional turn, etc. Put the slips of paper into the box corresponding to their categories.

To play the game, youth throw a ball or dart at the dartboard. Next, they pull a slip of paper from the box corresponding to the color on which the ball or dart landed. As an example from above, if the thrown ball landed on yellow, youth would pull a slip of paper from the yellow box. If the slip said “virus,” their challenge is to name a disease caused by a virus. If it landed on blue, they need to name an animal disease. If it lands on red, they need to name a disease that can be transmitted that way. If it lands on green, they need to name a disease that can be prevented that way.

If successful, youth are awarded the number of points of the dartboard segment on which the ball or dart landed. Older youth should expand on their answer and tell more of what they know about the disease they mentioned. The game could end after everyone has had one or two turns or a certain amount of time has elapsed.

The game can be made more complicated by having youth throw more than one ball or dart. Their response must somehow incorporate a term corresponding to each color landed on. Also, more complicated diseases such as bovine viral diarrhea, porcine epidemic diarrhea, brucellosis, Q fever, etc. could be included. The chart on the next page contains examples of livestock diseases, disease agents, transmission routes and preventative measures that can be used for this activity.

Dartboard Game: Colored Segment Examples

BLUE Disease name	YELLOW Disease agent	RED Transmission	GREEN Prevention	BLACK Optional topic	WHITE Optional topic
Scrapie	Prion		Remove placentas promptly.		
Rabies	Virus	Bite from infected animal.	Vaccinate. Prevent contact with wildlife		
Ringworm	Fungus	Contact with contaminated animal. Contact with infected environment.	Prevent contact with infected animals. Prevent contact with infected environments.		
Mange	Parasite mite	Contact with infected animal.	Prevent contact with infected animals		
Tetanus	Bacterial toxin	Bacterial contamination of wound.	Vaccinate.		
Soremouth	Virus	Contact with infected animal. Contact with infected environment.	Vaccinate. Prevent contact with infected animals. Prevent contact with infected environments.		
Coccidiosis	Internal parasite	Ingestion of parasite eggs.	Medication. Environmental sanitation.		

Module I Activity Ideas

Act.	Act. = Activity ● = Explore ○ = Apply ◎ = Play ⊙ = Share B = Beginner I = Intermediate A = Advanced	B	I	A
1	Spell BIOSECURITY with 3x5 cards over their heads (they see cards except their own) without talking.	◎	X	X X
2	Same as above, but 3x5 cards have the phrases on them; must put in correct order without talking.	◎	X	X
3	Pull a phrase from a hat; have students tape it to the correct flip chart page (3 choices). (Could be a race.)	◎	X	X X
	Research one of the diseases in depth and share what you learned with the group.	●◎		X X
	Investigate which of these diseases are zoonotic.	●		X X
	Create or draw a model farm scene showing good and bad biosecurity practices.	○	X	X
	Play Biosecurity Charades: people act out biosecurity actions, others guess what they are doing, and what transmission risk that action addresses).	◎	X	X X
	These are just examples. For each action listed, for what other animals and/or diseases could you use it?		X	X X
4	Investigate more reasons for biosecurity and create more scripts.			X X
	Create a skit about biosecurity and food safety using these characters.	●◎		X X
	Display the bullet points on a board. Listen to each narration and match it to the bullet point. Discuss.	○	X	X X
	Why might someone not agree to use biosecurity? Have pairs of students choose one of the reasons, take opposite sides and debate the issue.	○		X X
5	Create more sentences using these or other words.	●	X	X X
	Give students the definitions and ask them for the word.	●◎	X	X X
6	Develop 3x5 flashcards with photos of pathogens on front and details on back.	●		X X
	Learn about one agent in depth; share what you learned with others.	●◎		X X
	Create an educational poster about a specific disease or pathogen.	○◎	X	X X
	If equipment is available, do some work with microscopes, looking for bacteria (culture tabletops, hands, etc. and incubate), mold (could grow some mold on bread), parasites.	●	X	X X
7	Investigate how bacteria are cultured and identified: the process, reason, etc.	●		X X
	Make other photo pairs of pathogens and the diseases they cause.	●		X X
	Create other agent-host-environment disease triads.	●		X X
	Again, if equipment available, swab and grow cultures. Look w/ microscope.	●	X	X X
8	Have students pick a disease & make up their own disease story about three factors that have to come together to cause disease. Have them draw or illustrate it in some way, present to the class.	●◎		X X
9	Research the proper way to clean and disinfect something.	●	X	X X
	Learn the difference between cleaning, disinfecting, sanitizing, and sterilizing. Create a poster or skit.	○◎		X X
	Interview someone who has had a soremouth outbreak on their farm.	●	X	X X
	Create a soremouth prevention poster for a show or fair.	●◎	X	X X
	If students created their own disease stories, have them think of changes that could be made to the host, agent and environment that could prevent diseases.	○	X	X X
	Present the group with different disease stories; have them brainstorm changes to prevent them.	●	X	X X
10	Play Triangle Tag for each of these diseases.	◎	X	X
	Play "What Goes Around Comes Around" game.	◎	X	X X
11	Create other crosswords using other terms from this module.	○		X X
	Create a biosecurity board game.	○	X	X X
	Create a game like "Concentration" where people match disease names with disease photos.	○		X X
	Create cards with definitions on one side and words on the other. Students divide into two groups. One picks from the stack & gives clues to their teammates to guess the appropriate vocabulary word.	◎	X	X
12	Where appropriate: emphasize Glo Germ™ handwashing activity.	●○	X	X X

Module I, Slide 10 Activity: Triangle Tag

Learning Objectives

- Appreciate real-life threats to animal health and how to protect against these threats
- Interact with biosecurity issues in a memorable way
- Motivate livestock project youth to consider biosecurity issues at all stages of their project
- HAVE FUN while learning with other 4-H youth and a caring adult mentor

Supplies: A plastic bowl, lid, or something else indestructible to place on floor

Ages: Any

Preparation time: Minimal

Activity length: 10 to 45 minutes depending on group size and interest shown

Instructions

Ask participants to get into groups of four. Three should hold hands and form a circle around some indestructible item placed on the floor, like a piece of paper or plastic bowl. Designate one member of the circle as "host;" the other two are "protectors." The fourth person is "it." IT should try to tap HOST on shoulder. PROTECTORS should do everything they can to keep this from happening. IT must remain outside the circle and cannot reach across the circle to touch HOST. The circle can twist and turn in either direction but must remain centered around the object on the floor. After the first IT has been successful, group members should change roles.

NOTE: this is a very active, high-energy activity. Anyone with knee problems or other health issues may prefer to observe.

Questions for Debriefing

- What did you find most challenging about this activity?
- What are some diseases you should be concerned about for your animals?
- What are the consequences of failing to consider biosecurity?
- What are some international human or animal health issues in the news?
- What steps can you take to protect your animal from threats to their health?

Ask youth to apply the triangle tag roles to real disease situations. Example:

IT = West Nile virus

HOST = horse

PROTECTORS = vaccinations; mosquito control; insect repellants; eliminate stagnant water

Other "IT's" to Consider:

- Soremouth (sheep and goats)
- Ringworm (all)
- Mastitis (all)
- Pneumonia (all)
- Influenza (poultry, swine, horses)
- Tetanus (horses, sheep, goats)
- Footrot (sheep, goats, cattle)
- Coccidiosis (all)

Module 1, Slide 10 Activity: What Goes Around Comes Around

Group size: 10+, limited only by space available. Based on the size of the group, mark out boundaries of a square big enough to contain everyone and give them room to walk around freely with both arms held out palms down and perpendicular to their bodies and not bump into each other too much. The activity leader should be outside the square. Have a volunteer (“Typhoid Mary”) enter the square with both arms held out palms up and wander around randomly. Each time Typhoid Mary touches one of the other people, that person should drop one arm; this indicates they have become “sick”. After two contacts with either Typhoid Mary or a “sick” or “dead” individual, both arms should be dropped, and the individual is “dead” and stands still for the duration of the activity. The activity continues until all individuals are sick or dead or the time available has run out (the concepts will become apparent within 5-10 min.).

Discussion

Share

- What did you notice?
- What surprised you?

Process

- How is this activity similar to what happens when an animal carrying a disease is introduced into a herd?
- Why should we be concerned about biosecurity and animal health?

Generalize

- How is this situation similar to what happens after a school vacation?
- What can you do to reduce your risk of contracting illnesses?

Apply

- What can you do to increase the biosecurity of your farm?
- How can you share what you learned with others?

Relevant Biosecurity Recommendations

- Provide adequate space for animal housing and movement (reduce stocking density).
- Provide good nutrition to booster animal health and immunity.
- Vaccinate to protect against diseases that can threaten animal health.
- Keep herds closed whenever possible.
- When necessary, purchase replacements from disease-free sources.
- Quarantine herd additions for at least one month.
- Isolate sick animals in a hospital area away from healthy animals.
- Remove dead animals from premises promptly and dispose of carcass.
- Separate animals according to age (do not mix young and old).

More Biosecurity Recommendations

- Purchase test-negative animals from test-negative herds.
- Isolate herd additions downwind and downstream for at least 30 days (3 mo. better).
- Use and maintain foot baths for human traffic.
- Minimize farm visitors and control their movements.
- Require fellow farmers to wear clean boots and clothing on your farm.
- Use fences to decrease access to areas of possible disease transmission.
- Have hand washing stations readily available at multiple sites.
- Use wind breaks to minimize airborne transmission of disease.
- Keep sick animals in an isolation area; do their chores last.
- Work with your veterinarian to develop an effective vaccination program and use it.
- Minimize animal stress.
- Provide adequate quality and quantity of nutrition.
- Practice excellent farm sanitation.
- Do not use manure-handling tools for feed handling.
- Remove and compost manure.
- Do not spread manure on pasture.
- Do not overcrowd animals.
- Provide good quality air through adequate ventilation.
- Disinfect equipment, facilities, instruments, tools and clothing.
- Use protective clothing (rubber boots, coveralls).
- Keep a closed herd if possible.
- Control flies, mice, cats, birds, etc.
- Avoid sales, shows and auctions.
- Provide shelter.
- Separate animals by age groups after weaning.
- Do not feed directly on the ground.
- Allow as much access to sunshine as possible.
- Control parasites.
- Fence off wet areas if possible.
- Provide clean water at all times.
- Be sure neonates receive good quality and quantity of colostrum.

Module 1, Slide 12 Activity: Glo Germ™ Handwashing Activity

For humans, frequent and effective handwashing is the backbone of protection from diseases. This activity will show you how well you do at removing “germs” from your hands with soap and water and to which areas you need to pay more attention to KEEP IT CLEAN.

This activity requires Glo Germ™ lotion and/or powder, a UV light (handheld or mounted in a black box) and a dark room.

Activity 1

Give everyone a nickel-sized amount of Glo Germ™ lotion in one of their palms. Tell them to rub the lotion over both hands, then go wash their hands as usual. When everyone is done washing, turn off the lights and run the handheld UV light over everyone’s hands. If they haven’t washed well, the Glo Germ™ UV sparkles will glow neon green under the light. Alternatively, they can put their hands into the box with the UV light and check for areas that glow. Typically, people don’t wash their nails, palms, and wrists well. If there is time, let everyone wash again and re-check with the UV light. Discuss what diseases we can catch and/or spread by ineffective handwashing.

Activity 2

The activity host should rub Glo Germ™ lotion on their hands a few minutes before the activity. They should then greet people at the door with handshakes, pats on the back, etc. and pass out handouts (topic of their choice, or simply a meeting agenda) to everyone. After everyone is seated (and/or after another activity of your choosing), turn off the lights and take the UV light around the room showing where the “germs” from the host’s hands ended up. Discuss how this game mimics the spread of flu, COVID-19, common cold, soremouth, and other contagious viruses.

NOTE: Clarify this activity uses a FAKE pathogen (disease-causing agent) that glows under UV light. Real germs will not glow like this; UV lights cannot be used to find out where bacteria, fungi and viruses are.

Module 2 Activity Ideas

Slide	● = Explore ○ = Apply ◎ = Play ⊙ = Share B = Beginner I = Intermediate A = Advanced		B	I	A
2	Youth discuss causes of diseases besides infectious (injury, nutritional, congenital, genetic, cancer, etc.).	●	X	X	X
4	Guess the five routes of infection before going further.	●◎		X	X
5	More questions: ● Who: name a disease that adult animals get but young animals don't and vice versa. ● What: describe how the disease has its effects on body. ● When: how does that affect what you can do to prevent the disease? ● Where: What are some diseases found in some parts of the U.S. and not in others? ● Why: how will understanding why a disease is important effect your actions? ● How: Name some diseases that can be shared between different species.	●○		X	X
8	Create other photo pairs (like Gus and the skunk) using other species most likely to get rabies.	●○	X	X	X
9	Go to www.cdc.gov and investigate other zoonotic diseases. Create an educational poster about rabies for public display.	● ○◎		X	X
11	Create a skit with a friend about why keeping wildlife as pets is not save.	○	X	X	X
12	Do an Internet search and learn about cases of human rabies transmitted through organ donations.	●		X	X
13	In what types of careers are humans most at risk of getting exposed to rabies, so should be vaccinated?	○		X	X
17	This animal has a form of identification called an ear tag. What is the purpose of such identification? How else are animals identified? Under what circumstances is it VERY IMPORTANT to be able to identify a particular animal?	●○	X	X	X
18	Name other sources of stress. Play "House of Cards" with building blocks of health: Get 3x5 cards. Write one of these words or phrases on each card. Now see how high a house of cards you can build with these "building blocks" of health: Good nutrition Clean environment Fresh air Vaccinations Enough space Clean water Shelter Rest Parasite control Manure removal Anything else that helps animals stay healthy.	◎	X		
19	Create a photo album of different materials used in livestock housing; compare pros & cons of each.	●○	X	X	X
21	Contact your veterinarian and ask him/her to call you the next time they diagnose a case of ringworm that "lights up" with a Wood's lamp. It's fun to see the fungus glow!	●	X	X	X
23	Watch a short video; count number of times actor(s) could infect themselves with a disease agent by ingesting it from their hands.	●	X	X	X
29	Investigate each of the diseases mentioned.	●		X	X
31	Create a photo gallery of fomites common in the environment of your choice of livestock species.	●○	X	X	X
32	Draw a diagram of the transmission cycle of a disease spread by a vector.	●○		X	X
33	Create more examples of each type of means of transmission.	●		X	X
Extra	Pay close attention to the news for a week (radio, TV, newspapers, internet, etc.). For every human or livestock disease you hear mentioned, research its route of infection and means of transmission.	●		X	X
	Make a homemade jigsaw puzzle: find a photo you like of a healthy animal of the species of your choice; glue it to cardboard. Cut the picture up into typical jigsaw puzzle shapes. On the back of each shape, write a term involved with keeping animals healthy. Now assemble your healthy animal puzzle!	●○	X		
	Biosecurity stone soup (best for younger children; older children can supervise): Have everyone sit in a circle on the floor or at a table. Put a pot of some sort in the middle. Give everyone several trinkets of some sort (marbles, Legos, plastic dinosaurs, whatever). In turn, each person throws something into the pot while they mention an action that will increase biosecurity and improve animal health. At the end, the pot should be full of "biosecurity soup".	◎	X	X	

Module 3 Activity Ideas

Slide		● = Explore	○ = Apply	⊙ = Play	⊚ = Share		B	I	A
		B = Beginner I = Intermediate A = Advanced							
2	Write a new introduction to another disease outbreak investigation; brainstorm ideas in a group.	●	○					X	X
3	Remember this slide. When you have finished with this module, come back to it and decide if you have met these learning objectives. Can you think of other things you learned not listed here?		○				X	X	X
4	Create a story about a neighbor, why they're concerned about the mystery disease, and what they do about it.		○				X	X	X
	Develop a skit with actors portraying all these characters.		○	⊙			X	X	X
7	Use charades to act out actions while others guess what you're doing and which route of infection it belongs to.		○	⊙				X	X
8	Add more examples of disease transmission.		○					X	X
9	Visit a farm and take photos. Print the photos and present them to your group. Ask the group to identify any sources of disease transmission risk and if so, have them sort according to direct or indirect.	●	○	⊙				X	X
10	Try to identify additional questions to ask yourself when looking for disease transmission risks.		○					X	X
13	Design and make other signs that contribute to farm biosecurity, i.e., Visitor Parking, Rest Room, Enter, etc.		○				X	X	X
14	Create a similar activity using flashcards. Put photos or descriptions of various disease transmission risks on 4x6 cards. Divide into two teams. Have one person hold up one card at a time for everyone and see which team can identify the risks vs. the protective factors fastest. This should be a fast and fun activity.			⊙				X	
15	Get a set of old wooden ABC blocks. Sort them according to colors. Have someone read the statements in this activity and build towers according to block colors/source.			⊙			X	X	
17	What is depicted in the lower right corner of this slide? Visit this area of a farm and learn more about it. What biosecurity risks could exist here?	●						X	X
18	In the large photo, find at least three aspects of the barn design that contribute to biosecurity, i.e.,		○					X	X
	● Fan for improved cow comfort and ventilation								
	● Stanchions to restrain animals for examination, treatment and vaccination.								
	● Feeding area separated from manure and urine area.								
	Investigate zoonotic diseases that are transmitted to humans through milk. What can be done to reduce risk?	●	○					X	X
	Practice reading a medication label and learn about how each medication should be stored.	●					X	X	X
	When would it be important to have detailed information about visitors recorded in a logbook?		○					X	X
20	Create a similar game with new questions (that perhaps students submit?) and play it at a group meeting.		○					X	X
24	Investigate the biosecurity principles behind separating baby calves at birth from their mother and other cows and calves. What major baby calf diseases does this practice reduce?	●	○					X	X
	Research the special properties of colostrum that make it essential to the health of newborns. What biosecurity risks can milk and colostrum pose, though? How can these risks be reduced?	●	○					X	X
31	Research the composting process. What factors are needed for effective composting? What management is needed to kill parasites, weed seeds and pathogens?	●	○					X	X
	Learn about USDA cost-sharing programs that help develop on-farm composting facilities. Draw a sketch of a plan you would like to use; how much would this facility cost you?	●	○						X
	Do a web search for "large animal mortality composting" to read about various ways to dispose of animal carcasses on a farm. In the event of some disease outbreaks, this might be the only legal and practical carcass disposal options. What other options might exist and what are the pros and cons of each?	●	○						X

Module 4 Activity Ideas

Slide		● = Explore	○ = Apply	⊙ = Play	⊚ = Share		B	I	A
		B = Beginner I = Intermediate A = Advanced							
3	Put a phrase on a 3x5 card & hand one to each student. Mingle, then line up to put the phrase in the correct order. For older students, have them think of alternative definitions and do the same activity.			⊙			X	X	X
6	Look through magazines, newspapers or other sources to find photos representing each transmission category.	●					X		
7	Be a reporter; interview a friend pretending to be a farmer to explain a strategy to reduce risk.		○				X	X	
8	Have youth play charades and act out all the strategies they can. Let younger children use the list.			⊙			X	X	X
	Put each strategy on a 3x5 card, give one to each youth. Have them sort themselves into appropriate category.			⊙			X	X	
9	Go on a tour of a real dairy farm. Learn about how the farm operates, then focus on biosecurity.	●					X	X	X
10	Use Google Maps/Earth for a birds-eye-view of a dairy farm. Print it & identify areas of transmission risk.		○				X	X	
11	Look up the cost of a new skid steer.	●					X	X	
	List the advantages and disadvantages of both buying and selling animals at a livestock auction.		○				X	X	
12	Using a farm play set and model animals, set up farm scenes depicting each of these transmission risks.		○				X	X	X
13	Investigate the most common diseases that can be carried by apparently healthy-looking livestock of each species. What can be done to keep them from bringing disease into a herd?	●○					X	X	
15	Conduct handwashing effectiveness experiments using Glo Germ™ lotion and a UV light.	●○		⊙			X	X	X
20	Practice cleaning & disinfecting various objects, i.e. boots, buckets, etc. Follow with Glo Germ™.		○				X	X	X
22	Notice other areas of the farm not addressed in this module? Identify transmission risks for some of them.	●○					X	X	
	Look at people's footwear at various events. How dirty are they? How much disease risk does that pose?	●○					X	X	X
	Create an educational poster about the importance of clean footwear for display at a fair or other event.		○	⊙			X	X	X
28	Make a list of all the people who visit a dairy farm in a month, such as veterinarians, students, etc. Rate each one regarding the level of disease transmission risk they could pose to a dairy.	●○							X
	How would you use a visitor log? In what circumstances would one be important?		○				X	X	
29	Investigate various disinfectants; read labels carefully to compare them. What pathogens is each effective against? What is the required contact time for effectiveness? How should used disinfectant be discarded? What is the proper concentration? How much does each one cost by the gallon and by the use?	●○					X	X	
31	Make an appointment to visit a veterinary clinic; try on personal protective equipment (gloves, coveralls, etc.).			⊙			X	X	X
	Decide what you would say to a good employee if you owned a chicken farm and they kept pet chickens at their home. You want to keep this good employee, but you also want to keep your birds healthy!		○						X
32	Examine labels of various vaccines and medications (go to a feed store for examples). Learn about proper storage, expiration dates, whether or not meat and milk from treated animals can't be used for human food for a certain amount of time, and other important information on the labels.	●					X	X	
36	It is very hard to keep livestock feed & water clean! What design can you come up with that might work?		○				X	X	
37	Create other matching activities like this for other biosecurity topics such as pathogens and their types; diseases and their signs; vaccines and the diseases they prevent; etc.		○				X	X	
40.2	Investigate the process of composting carcasses. What could be used as a carbon source in your area?	●○					X	X	
	Learn about USDA cost-sharing programs in your area to manage manure properly and keep waterways clean.	●							X
58	Recreate the dairy farm investigation but feature a different species of livestock.		○				X	X	

Module 4, Slide 15 Activity: Glo Germ™ Handwashing

For humans, frequent and effective handwashing is the backbone of protection from diseases. This activity will show you how well you do at removing “germs” from your hands with soap and water and to which areas you need to pay more attention to KEEP IT CLEAN.

This activity requires Glo Germ™ lotion and/or powder, a UV light (handheld or mounted in a black box) and a dark room.

Activity 1

Give everyone a nickel-sized amount of Glo Germ™ lotion in one of their palms. Tell them to rub the lotion over both hands, then go wash their hands as usual. When everyone is done washing, turn off the lights and run the handheld UV light over everyone’s hands. If they haven’t washed well, the Glo Germ™ UV sparkles will glow neon green under the light. Alternatively, they can put their hands into the box with the UV light and check for areas that glow. Typically, people don’t wash their nails, palms, and wrists well. If there is time, let everyone wash again and re-check with the UV light. Discuss what diseases we can catch and/or spread by ineffective handwashing.

Activity 2

The activity host should rub Glo Germ™ lotion on their hands a few minutes before the activity. They should then greet people at the door with handshakes, pats on the back, etc. and pass out handouts (topic of their choice, or simply a meeting agenda) to everyone. After everyone is seated (and/or after another activity of your choosing), turn off the lights and take the UV light around the room showing where the “germs” from the host’s hands ended up. Discuss how this game mimics the spread of flu, COVID-19, common cold, soremouth, and other contagious viruses.

NOTE: Clarify this activity uses a FAKE pathogen (disease-causing agent) that glows under UV light. Real germs will not glow like this; UV lights cannot be used to find out where bacteria, fungi, and viruses are.

SCRUB Kit Descriptions and Correlating Modules

View the SCRUB Kits on HFHA website:

- <https://www.healthyagriculture.org/training/youth-4h-ffa/biosecurity-learning-modules/scrub-biosecurity/>

SCRUB Kit	Description	Modules			
		1	2	3	4
Direct/Indirect Disease Transfer	Through a disease transmission experiment and discussion of a disease outbreak scenario, students will explore the dynamics of disease transmission and how a highly contagious disease can spread quickly.	X	X		
Importance of cleaning and disinfecting					
A. Personal hand washing	Proper hygiene and sanitation are keys to reducing the spread of animal disease, and human diseases as well. Using Glo Germ™, students will see how effectively they wash their hands before and after watching a World Health Organization video on proper hand washing technique.	X	X		
B. Cleaning typical farm surfaces	Students will explore the relative ease of cleaning “manure” (potting soil, water and Glo Germ™) off different materials used in livestock facilities.	X	X		
C. Importance of cleaning properly and following disinfectant guidelines	After making their own incubators, students will conduct an experiment to test various ways people commonly “clean” their boots. After cleaning, students will swab their boots, streak onto culture plates, and incubate the cultures for about four days, comparing the number of bacteria grown from different cleaning and disinfecting methods.	X	X	X	X
D. Proper handling of vaccines.	Students will research the different types of vaccines used for common animal diseases and their handling and storage requirements. Students will then create and test different ways to make an emergency cooler to store vaccines for 24 hours.			X	X

Homework and Quiz Bank Questions

Module 1: What is Animal Biosecurity?

1. Define "biosecurity".
2. Give four reasons why biosecurity is important for agriculture.
3. Name five types of disease agents we can prevent or control with biosecurity.
4. What are the three factors that have to be just right in order to cause disease?
5. Match the definition to the correct word:

a. Living things that can be affected by disease causing agents.	_____ Zoonotic
b. Diseases spread by disease-causing agents.	_____ Agents
c. Things capable of causing disease.	_____ Biosecurity
d. Actions that can prevent or control the spread of diseases.	_____ Host
e. Disease that can be passed between animals and humans.	_____ Infectious

Key:

1. Biosecurity is the actions we take to prevent or control diseases of humans and animals.
2. Prevent animal illness and disease
 - Prevent zoonotic disease
 - Prevent economic loss
 - Keep food prices low for consumers
 - Keep good public opinion
 - Keep trade open
3. Bacteria; Viruses; Fungi, Parasites; Prions
4. Agent – Host – Environment
5.
 - a. Hosts
 - b. Infectious
 - c. Agents
 - d. Biosecurity
 - e. Zoonotic

Quiz Bank, Module 2: Routes of Infection and Means of Transmission

1. What are the six questions you need to answer to help you devise ways to prevent a disease from spreading?
2. Consider the following situations and choose the correct route of infection:
 - a. A calf got Johne's disease by nursing from an infected mother. Inhalation
 - b. A lamb got scrapie by contact with fluids & tissues from the uterus after birth. In utero
 - c. A young goat kept in a wood pen in an old barn got ringworm. Breaks in skin
 - d. Thin cattle on a pasture seen breathing hard suddenly died. Tests showed the cows died from pneumonia caused by a fungus called aspergillus. Mucous membrane
 - e. Some calves were born with cloudy eyes two months after new cows were added to the herd. One of the cows was later found to be infected with Bovine Viral Diarrhea (BVD). Ingestion
3. Match the means of transmission with the correct definition:
 - a. Objects that carry disease agents. Direct contact
 - b. When a healthy animal comes in close contact with an infected animal Vectors
 - c. An insect bites an infected animal and picks up a virus, then bites another animal and passes it on Indirect contact
 - d. Animals that are not infected but carry disease & pass it to other animal Wildlife
 - e. Can spread disease by direct or indirect contact Fomites

Key:

1. Who can get the disease?
What effect does the disease have on the body?
When is the animal most likely to get the disease?
Where is the disease found in the environment?
Why is this disease important to know?
How can this disease spread to other groups of animals?
2.
 - a. Ingestion
 - b. Mucous membranes
 - c. Breaks in skin
 - d. Inhalation
 - e. In utero
3.
 - a. Fomites
 - b. Direct contact
 - c. Vector
 - d. Indirect contact
 - e. Wildlife

Quiz Bank, Module 3: Finding Sources of Disease Transmission Risk

1. Which of the following are examples of Animal to Animal transmission? Choose all that apply.
 - a. Young susceptible animals put on a pasture previously used by older animal
 - b. Wildlife coming into contact with livestock
 - c. Dirty, contaminated animal housing
 - d. Animals separated according to age
2. Which of these practices are more common in small operations? Choose all that apply.
 - a. Borrowing sires for breeding replacement animals
 - b. Housing animals in concrete or metal facilities
 - c. Lack of quarantine for incoming animals
 - d. Keeping livestock in confined areas with poor ventilation
3. Lack of sanitation lets disease agents build up, which makes contact between disease agents and animals more likely. This is a risk of what potential source of disease transmission?
 - a. No isolation or isolation too close to barn
 - b. Incorrect storage of vaccine
 - c. Inadequate cleaning and disinfecting of clothing, equipment, and facilities
 - d. Separate sick animals from herd
4. Which human activity can spread disease from sick to healthy animals? Choose all that apply.
 - a. Insects and birds
 - b. Working with sick animals before healthy
 - c. Contaminated feed or water
 - d. Wildlife/domestic animals in barn
5. Which strategies below would you use to prevent sick animals from spreading diseases to herd mates?
 - a. Set up handwashing stations
 - b. Store vaccines in a cool, clean, dry place
 - c. Keep barns clear of birds and insects
 - d. Separate sick animals from the herd
6. Which of these is an example of possible equipment, hand, footwear, and clothing carrying disease agents?
 - a. Hoof trimming
 - b. No isolation area
 - c. Incorrect storage of vaccine
 - d. Birds and insects in the barn
7. Sick animals can spread disease directly to their herd mates. Which of these is a source of this type of risk?
 - a. No handwashing facilities
 - b. Hoof trimming
 - c. Poor ventilation
 - d. No isolation area or isolation too close to the barn
8. What is the risk involved with storing vaccines incorrectly?
 - a. Human hands can carry diseases and spread them to healthy animals.
 - b. Sick animals can spread diseases through direct contact.
 - c. High temperatures or freezing can kill vaccines.
 - d. Contaminated equipment can carry disease agents and be a source of transmission.

9. What is the risk of employees keeping the same type of animals at home as those where they work?
 - a. Working with the same species of animals increases chances of spreading diseases.
 - b. The workers might not wash and disinfect their hands well before coming to work.
 - c. The workers might have dirty shoes or clothes.
 - d. All of the above.
10. Visitors can carry _____ inside their body that can infect other people and animals.
 - a. blood
 - b. disease agents
 - c. food
 - d. water
11. Which of these operations usually has the strictest rules about visitors?
 - a. beef cattle ranch
 - b. sheep farms
 - c. large pig farms
 - d. goat farms
12. Common sources of contaminated feed or water include:
 - a. cats
 - b. birds
 - c. mice
 - d. all of the above
13. Wildlife spreading disease to farm animals is not much of a problem for which type of farm:
 - a. large sheep farm
 - b. cattle ranch
 - c. large pig farm
 - d. small dairy farm
14. Wildlife can spread diseases to farm animals by direct and indirect means of transmission. T or F
15. Which of these strategies is the best way to prevent spreading disease agents from humans to animals?
 - a. Isolate sick animals from healthy animals.
 - b. Have handwashing facilities in all the areas where people work with animals.
 - c. Don't hire employees that keep the same type of animals as are on the farm.
 - d. Keep wildlife/domestic animals out of the barns.
16. Which type of animal operations usually have the best set up for handwashing?
 - a. Beef cattle and pig
 - b. Sheep and dairy cattle
 - c. Goats and sheep
 - d. Dairy cattle and pigs
17. Match the following disease transmission sources with a risk:

a. ___Poor manure management	1. Can carry disease agents on their bodies & feces or by biting.
b. ___Dirty and shared equipment	2. Disease can spread from nose to nose contact.
c. ___Fence-line contact	3. Can be a source of disease & contaminate pastures, feed, water.
d. ___Insects and birds	4. Other animals can sniff or lick them, spreading disease.
e. ___Abortions left lying on the ground	5. Can carry disease agents on tires from farm to farm.

Key:

1. B, D	6. A	11. C	16. D	17. a) 3
2. A, C	7. D	12. D		b) 5
3. C	8. C	13. C		c) 2
4. B	9. D	14. True		d) 1
5. D	10. B	15. B		e) 4

Quiz Bank, Module 4: Biosecurity Strategies

1. Which of the following strategies would you use to decrease risk of disease transmission between humans and animals? Choose all that apply.
 - a. Have a closed herd
 - b. Protect feed and water from contamination
 - c. Use personal protective equipment (gloves, clean boots, coveralls)
 - d. Have separate equipment for feed and manure
 - e. Care for animals in the following order: healthy, quarantined, sick, wash hands & change PPE between
 - f. Ensure good air quality through effective barn ventilation systems
 - g. Restrict visitors; Keep a log of visitors
2. Choose the single most important action you can take to reduce disease transmission on a farm:
 - a. Restrict visitors; Keep a visitor log
 - b. Prevent employee ownership of same species of livestock as those cared for
 - c. Prevent food and water from contamination
 - d. Proper handwashing
 - e. Isolate and treat sick animals
3. Below are some sources of disease transmission risks and some biosecurity strategies. Match each strategy with the risk it is designed to reduce:

<ol style="list-style-type: none"> a. ___ Chronically sick animals b. ___ Using brother-in-law's bull c. ___ New or returning animals to the herd d. ___ Poor ventilation e. ___ Skid steer in barn f. ___ Contaminated wooden rails 	<ol style="list-style-type: none"> 1. Quarantine herd additions 2. Install effective barn ventilation systems 3. Cull animals that do not respond to treatment 4. Avoid dirt and wood-based facilities 5. Use AI for breeding whenever possible 6. Have separate equipment for feed and manure
--	--
4. When should you wash your hands?
 - a. Before eating
 - b. After handling animals
 - c. Anytime they are dirty
 - d. Anytime you want to keep from getting ill
 - e. All of the above
5. When is sanitizing hand gel use NOT acceptable for disease prevention?
 - a. When hands are not visibly dirty
 - b. When soap and water are not available
 - c. When hands are covered with dirt and/or manure
6. Which factor is NOT an essential part of effective handwashing?

a. Running water	c. Friction
b. Soap	d. Antibacterial soap
7. Handwashing is the easiest, most effective thing you can do to prevent the spread of germs. T or F

8. Number the following steps for cleaning and disinfecting in the order they should be done:
- a. Wash the area or item with water and detergent. _____
 - b. Thoroughly rinse away any residual disinfectant and allow the area or item to dry. _____
 - c. Remove all grossly visible debris. _____
 - d. Thoroughly rinse cleaned area to remove detergent residue and allow to dry completely. _____
 - e. Select and apply an appropriate, effective disinfectant, allowing for proper contact time. _____
9. Which of the following potential sources of risks are considered human to animal? Choose all that apply.
- a. Isolation too close to other animals
 - b. Employees keep same type of animals.
 - c. Farm workers tend to sick cows before working with healthy cows.
 - d. Vaccines and medicines aren't stored correctly.
 - e. Veterinarians going from farm to farm to treat animals
10. Which of these strategies should be used to reduce disease transmission by visiting caregivers?
- a. Restrict visitors; Keep a log of visitors
 - b. Clean and disinfect (C&D) before and after working with animals
 - c. Use Personal Protective Equipment or PPE (gloves, clean boots, coveralls)
 - d. All of the above
 - e. B only
11. Routine laundering is sufficient for cleaning of coveralls or other clothing worn around livestock. T or F
12. Which of these strategies will reduce disease transmission by your workers? Choose all that apply
- a. Discourage employees from owning the same species of livestock
 - b. Clean and disinfect (hands, feet; shower in/out)
 - c. Wear the same clothing and footwear at home and work.
 - d. Use personal protective equipment (PPE: gloves, clean boots, coveralls)
13. Which of the following statements is NOT a correct way to store vaccines?
- a. Keep vaccines and medicine in the freezer
 - b. Wipe tops of bottles with alcohol and keep them covered to keep them sterile.
 - c. Store vaccines and medicine in a cool, dry place.
 - d. Read and follow manufacturer's instructions on label.
14. There is an order to caring for animals biosecurely. Put these in the correct order (1,2,3):
- a. Quarantined. Wash hands/change PPE _____
 - b. Sick. Wash hands/change PPE _____
 - c. Healthy. Wash hands/change PPE _____
15. In the choices below, match each strategy with the risk it is designed to reduce:
- | | |
|--|--|
| a. ___ Use PPE (personal protective equipment) | 1. No place for workers or visitors to wash hands |
| b. ___ Establish and maintain a line of separation | 2. Control insects, birds, wildlife, and other species |
| c. ___ Create hand washing stations | 3. Cull truck drives through calving area |
| d. ___ Contaminated water | 4. Visitors |
| e. ___ Cats with calves | 5. Protect feed and water from contamination |
| f. ___ Manage manure effectively | 6. Body parts of dead animals contaminate feed/water |
| g. ___ Prevent contact with neighboring animal | 7. Overflowing manure |
| h. ___ Dispose of placentas & aborted fetuses promptly | 8. Animals have nose-to-nose contact over a fence |

16. Which of these are potential costs of doing nothing in the way of biosecurity? Choose all that apply.
- Medication for sick animals
 - Animal death
 - Vaccination costs
 - Fewer pregnancies
 - Setting up isolation areas for new animals
 - Permanent contamination of environment
17. What criteria should you use when deciding which biosecurity strategies to implement first?
- Easiest
 - Cheapest
 - Most effective
 - All of the above
 - B and C

Key:

1. C, E, G	7. T	14. a. 2	16. A, B, D, F
2. D	8. a. 2	b. 3	17. D
3. a. 3	b. 5	c. 1	
b. 5	c. 1	15. a. 4	
c. 1	d. 3	b. 3	
d. 2	e. 4	c. 1	
e. 6	9. B, C, E	d. 5	
f. 4	10. D	e. 2	
4. E	11. T	f. 7	
5. C	12. A, B, D	g. 8	
6. D	13. A	h. 6	

Quiz Bank, Module 5: Public Speaking for Biosecurity Advocates I

1. What are the three elements you need to address for a successful presentation?
 - a. Content, Body, Delivery
 - b. Introduction, Body, Delivery
 - c. Content, Structure, Delivery
 - d. Structure, Conclusion, Delivery
2. What are the three most common purposes for giving a presentation?
 - a. Competition, assignment, entertainment
 - b. Debate, county fair, state fair
 - c. Inform, persuade, entertain
 - d. Class assignment, county fair, Toastmaster meeting
3. You can create a very persuasive presentation without knowing anything about your audience. T or F
4. Match the meaning of each "CRAAP" term for evaluating resources?

a. ___ Currency	1. How will the information fit your needs?
b. ___ Relevance	2. Why was it written: to inform, sell, advise, advocate, entertain, or persuade?
c. ___ Authority	3. Is the information reliable, truthful, correct w/o bias and free from emotion?
d. ___ Accuracy	4. When was the information written and last updated?
e. ___ Purpose	5. How trustworthy and believable is the source?
5. Your topic sentence should:
 - a. Be the first thing you tell your audience,
 - b. Clearly and simply state your key purpose for your presentation
 - c. Help you stay focused on your message
 - d. All of the above
 - e. B and C
6. Put the following steps for creating your presentation in order from 1 – 5.

a. Gather resources	_____
b. Write your presentation	_____
c. Create an outline	_____
d. Write your topic sentence	_____
e. Add supporting ideas	_____
7. Supporting ideas strengthen your presentation. Label the following as either Logical examples (L) or Emotional examples (E):
 - a. ___ Case studies that help your audience relate
 - b. ___ Statistics to prove a point
 - c. ___ Facts to convince your audience
 - d. ___ Stories that appeal to your listeners' feelings
8. Which of the following should you NOT do when you writing your presentation?
 - a. Put your ideas in a logical sequence.
 - b. Use big vocabulary words and jargon to impress your audience.
 - c. Use your logical examples to give your presentation credibility.
 - d. Use emotional examples to make your listeners care about your topic.

9. Visual aids are interesting but distract the audience from your message. T or F
10. The main purpose of the opening statement is:
- To introduce yourself
 - To introduce your topic
 - To grab your audience's attention
 - To explain what you are going to talk about
11. In a persuasive presentation your concluding remarks should:
- Review your main points
 - End with a challenge
 - Give your audience a way to make a difference
 - All of the above

Key:

1. A	5. D	7. a) E
2. C	6. a) 1	b) L
3. False	b) 5	c) L
4. a) 4	c) 3	d) E
b) 1	d) 2	8. B
c) 5	e) 4	9. F
d) 4		10. C
e) 2		11. D

Quiz Bank, Module 6: Public Speaking for Biosecurity Advocates II

1. When you speak, you use verbal and nonverbal communication. Label the attributes below as verbal (V) or nonverbal (N).
 - a. ___ Take breaths to slow down your pace
 - b. ___ Use pauses for emphasis
 - c. ___ Use facial expression to strengthen your message
 - d. ___ Change your rate to maintain interest
 - e. ___ Eye contact can help you engage your audience
 - f. ___ Adjust the volume to your audience and environment
2. Mark each of the statements below as an effect of speaking softly (S) or loudly (L):
 - a. ___ Has the power to grab the audience and hold them
 - b. ___ Implies conviction in your message
 - c. ___ Audience needs to listen more carefully as you draw them in
 - d. ___ Emphasizes your message to your audience
 - e. ___ Makes what you're saying more intimate and personal
3. Your verbal language needs to be intelligible, conversational, and expressive. Which of the statements below makes your speech intelligible? Choose all that apply.
 - a. Speak in a conversational tone.
 - b. Articulate your words so they can be clearly heard and understood.
 - c. Avoid using filler words.
 - d. Speak with emotional conviction.
 - e. Learn and practice how to say unfamiliar words.
4. Fill in the following sentence with the correct word:
 To _____ means to _____ each _____ in a word correctly and _____.
 - a. distinctly
 - b. pronounce
 - c. articulate
 - d. syllable
5. Which of the following could be considered "filler words" in a presentation?
 - a. speaking too quietly
 - b. like
 - c. you know
 - d. awkward pauses
 - e. um
 - f. totally
 - g. mispronunciation
 - h. speaking too fast
6. Identify each of the following speaking tips as intelligible (I), conversational (C), or expressive (E).
 - a. ___ Match your emotion to your message.
 - b. ___ Don't read your speech or slides.
 - c. ___ Talk with, not at or to, your audience.
 - d. ___ Pronounce correctly and articulate clearly.
 - e. ___ Vocal variety (highs and lows, loud and soft) keeps your message interesting.
 - f. ___ Pauses create interest and slow and calm you down.
 - g. ___ Spontaneity includes responding to audience's comments.
 - h. ___ Emphasis conveys importance and emotion.
7. Which communication mode affects your audience the most? Which is the least?
 - a. Verbal _____Most
 - b. Non-verbal _____Least

8. Identify the following statements as True (T) or False (F):
- ___ You can use gestures to gauge your audience’s reaction and interest.
 - ___ Your face shows your attitudes, feelings, and emotions more than any other form of communication.
 - ___ It’s not what you say, it’s the way you say it.
 - ___ Random, repetitive gestures are the most effective form of communication.
 - ___ The most visible action you can make is body movement.
 - ___ A presenter should be at least as well-dressed as the most casually dressed person in the room.
9. Good posture does which of the following (Select all that apply).
- Makes a good first impression
 - Helps you breathe
 - Tells your audience you are in control of yourself and your presentation
 - Projects your voice
 - Increases nervous tension
10. What is the most crucial moment of your presentation?
- The first minute you are on stage before you say anything
 - Your greeting when you first start talking
 - Your introduction to your talk
 - When you review your main points
 - Your conclusion
11. When giving your presentation, you should never move your body without a reason. T or F
12. Fill in each sentence with the missing word or words from the list on the right.
- Begin with a _____ and make _____ with one or two people.
- Eye contact makes your presentation direct, personal, and _____.
- Stand _____ on our feet; don’t _____ back and forth.
- Don’t _____ your arms wildly but do use _____ as appropriate.
- Show _____ for your subject.
- Act and look like you _____ presenting.
- conversational
 - enjoy
 - enthusiasm
 - eye contact
 - gestures
 - smile
 - steady
 - swing
 - rock

Key:

1. a. V b. V c. N d. V e. N f. V	2. a. L b. L c. S d. L e. S 3. B, C, E 4. C, B, D, A (in order) 5. B, C, E, F	6. a. E b. C c. C d. I e. E f. I g. C h. E	7. Most B; Least A 8. a. F b. T c. T d. F e. T f. F	9. A, B, C, D 10. A 11. True 12. F, D, A, G, I, H, E, C, B (in order)
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Jobs and Careers in Biosecurity

Biosecurity is about management and interventions in animal production and the food supply to prevent the spread of diseases throughout these complex systems. Therefore, animal health and biosecurity knowledge are valuable to many careers and specific jobs within agriculture, food production, recreational animal industries, public health and agri-food business.

Of course, careers in veterinary medicine may come to mind first, but this knowledge and a risk management mindset will benefit anyone working in this broad field. The list below provides examples of careers and jobs across this system where biosecurity knowledge is an asset, if not a requisite. Teachers and students may also brainstorm additional examples of opportunities.



Animal Agriculture and Allied Industries

Everyone who interacts, directly or indirectly, with recreational and food animals has a role to play in biosecurity. Any connection or interaction between animals, between people and animals, between animals and tools, equipment, or vehicles/trailers can be an opportunity to spread a pathogen (disease-causing organism). In the course of working in the following jobs or situations, biosecurity knowledge is important to manage that contact with separation in time, separation in space and cleaning between contacts.

- Livestock and poultry management
 - herdsman
 - barn/stable manager
 - flock manager
 - ranch manager
- Animal care and handling
 - farm and ranch hands
 - farriers/hoof trimming
 - animal shippers and haulers
 - auction, show, and event staff and promoters
- Breeding and genetics service providers
 - A.I. and ultrasound technicians
 - breeding stock providers/sellers
- Veterinarians and technicians
- Livestock and poultry judges
- Livestock feed and supplies representatives



Animal Facilities Design and Management

As previously described, biosecurity is about understanding direct and indirect interactions between animals and eventually food products. Therefore, those who design and manage farms, ranches and animal facilities need biosecurity knowledge. This knowledge will allow them to design facilities and plan animal movement through facilities, to minimize contact that poses a risk to good biosecurity.

- Agricultural engineers, designers and managers of:
 - working facilities
 - barns and stables
 - pens and lots
 - confinement and feeding facilities
 - fairgrounds, auction yards and event facilities
 - manure and agricultural waste management facilities
 - manure and agricultural waste management processes (land application of manure, composting, dead animal management facilities)
 - feed mills and feed storage facilities

Public Health and Food

Continuing the theme of direct and indirect interactions between animals, people, and/or food, those who work in food production and with consumers should have a great deal of biosecurity knowledge. Examples of jobs or careers:

- Meat and food processing managers and employees
- Food service industry employees
- Meat, food and restaurant inspectors
- General sanitarians
- Public health doctors and nurses
- Epidemiological experts and investigators

Communications

Many jobs fulfill the important role of communicating biosecurity concepts and practices within animal and food industries and to consumers (the general public). As EVERYONE interacts with the food system somewhere, communicating about biosecurity in general, and in emergencies is important. The following examples are but some of the communication careers where biosecurity knowledge could be applied.

- Agricultural writers and journalists
- Commodity and producer group public relations (PR) staff
- Government agency public information officers (PIOs)
- Emergency PIOs in government and private organizations

Education and Research

Legitimate and sound biosecurity practices should be grounded in science, i.e. research- and evidence-based knowledge. Jobs in this area represent a system of research, education, and policy development. These jobs usually require college education at a minimum and specific knowledge of animal and food systems.

- Research scientists (universities or government agencies)
- University instructors and professors
- Industry analysts
- Science advisors to industry groups and government
- K-12 teachers
- Adult and Extension educators
- 4-H and youth project leaders and advisors



Government, Law Enforcement and Emergency Responders

All of the jobs or careers listed in this unit have a role to play in biosecurity. Some examples below may also be listed in other categories or may be similar to previously listed examples. There are additional specific roles that may be important in managing biosecurity related to commerce (business), trade and agricultural and food emergency response.

- Port, border, import inspectors for animals and food
- Brand inspectors
- Policy makers (those who make laws and rules about biosecurity)
- Law enforcement (local, state, and federal) engaged in animal and food emergencies
- Animal rescue organization managers and volunteers
- Emergency responders in general (traffic and transportation, medical and health, etc.)
- Subject matter experts (relevant to animal or food disaster or emergency; these may be the same examples listed above in Education and Research)
- Emergency response managers (incident commanders)



For a related activity, students could research a career from the examples above, or one they have identified. On the next page is a sample worksheet of important career information for students to complete and a completed example.

Student Name: _____ Date: _____

Biosecurity and Animal Health Jobs and Careers Report/Factsheet

Career or job title:
Education and experience required:
Businesses, organizations, or agencies where these jobs exist:
Salary or wage (optional):
Description of duties and responsibilities:
Why is biosecurity important to this job/career?
References (websites, publications, interviews and personal communication):

Notes:

Student Name: Ashley Bartlett

Date: 01/01/0000

Biosecurity and Animal Health Jobs and Careers Report/Factsheet

Career or job title: Extension educator
Education and experience required: college degree, master's degree, PhD
Businesses, organizations, or agencies where these jobs exist: University Extension Service, Land Grant University
Salary or wage (optional): \$35,000 to \$80,000
Description of duties and responsibilities: Extension educators work with researchers and scientists to deliver valid and reputable evidence-based information and advice to clients. Clients may include farmers and ranchers, food processors, consumers and households, youth and students, emergency responders, policy makers, and many other stakeholders in animal and food systems. They work on behalf of the public as part of state universities or USDA.
Why is biosecurity important to this job/career? Extension educators have broad and some expert-level knowledge of agriculture, food, and health. They are viewed as sources of science-based information and can advise people on biosecurity specifically, or why it is generally important in animal and food systems. Because Extension educators work with many farm and ranch families, households, or the food industry they must practice biosecurity while travelling and visiting farms, ranches, fairs and events and homes, so they don't spread a pathogen or animal disease.
References (websites, publications, interviews and personal communication): Ag Careers Website: https://www.agcareers.com/career-profiles/extension-agent.cfm Biosecurity for Extension Personnel: https://ohioline.osu.edu/factsheet/vme-5 Personal interview: Joanne Jones, Extension Agent, Hazzard County Extension

Notes: This was an interesting project. I think I would like to be an Extension educator for my state and county.

Community Service and Leadership: Opportunities for Youth

- Junior leadership at county fairs, exhibits, etc.
- Give a talk at a local farmer education meeting.
- Public speaking i.e., junior presentation to county fair board, local government, local producer group meetings, civic club.
- Assist with farm tours.
- Volunteer at an animal shelter.
- Join the fair board as a youth advisor, emphasizing biosecurity.