

# Biosecurity

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## Goal (learning objective)

Youth will:

- Learn the definition of biosecurity
- Learn how to create a biosecurity plan
- Learn the differences between external and internal biosecurity procedures

## Supplies

- Handout 1, “How to Develop a Simple Biosecurity Plan”. Make the appropriate number of copies for your group
- Handout 2, “Internal and External Biosecurity Worksheet”. Make the appropriate number of copies for your group
- Handout 3, “Did you know?” Make the appropriate number of copies for your group
- Handout 4, “Internal and External Biosecurity Worksheet Questions” Make the appropriate number of copies for your group
- Pens or Pencils (enough for group)

## Pre-lesson preparation

- Read page 12-5 from the *Beef resource handbook*.
- Read pages 28-33 from the *Youth Beef Quality Assurance Program Manual for the Pacific Northwest, PNW 593* available at [https://extension.usu.edu/cache/files/Youth\\_Beef\\_Quality\\_Assurance.pdf](https://extension.usu.edu/cache/files/Youth_Beef_Quality_Assurance.pdf)

## Lesson directions and outline

Background information:

*Quality Assurance:* Market livestock projects bring new responsibilities for 4-H youth. Members are providing a product for consumers to eat. Consumers will choose to buy, not to buy, a product from their perception of the value of that product. If your product (steak, roast, etc.) wasn't “good”, the consumer will not purchase it again. What would happen to a business if no one purchased its products again? This pertains to you as a livestock producer, or producer of food. When quality is high, consumers will buy your product again. Livestock products must be safe, wholesome, and produced in a way that meets consumer approval.

Who is in charge of quality assurance in the livestock industry? When you feed a steer, sheep, pig or goat and sell it in the Livestock Sale at the fair, who is responsible for assuring that the meat eaten by the consumer is a high-quality and safe product? The retailer? The packer? The member? The breeder? Everyone involved in the livestock industry is obligated to do their part to provide a safe, wholesome, and quality product to the consumer.

*Biosecurity:* Biosecurity is a combination of management practices designed to prevent the introduction and transmission of diseases and disease-causing agents into a herd. The goal of biosecurity is to prevent, minimize, or control cross-contamination of body fluids (feces, urine, saliva, etc) between animals, between animals to feed and between animals to equipment that may directly or indirectly contact animals.

Biosecurity can be either external or internal. External biosecurity is keeping diseases out of a herd, whereas internal biosecurity is keeping diseases already in one more segments of the herd from

spreading to other segments. However, all biosecurity measures should be focused on the prevention of the entry of unwanted diseases!

Maintaining a biosecurity program is the cheapest, most effective means to control disease, and no disease prevention program will be effective without it.

According to the National Beef Quality Assurance Program (NCBA, 2012), implementation of a good biosecurity program should focus on the following:

- Controlling disease within the herd
  - Vaccinate the herd against all endemic diseases
  - Use low stress management for movement and processing
  - Isolate sick animals
  - Maintain a closed herd, if possible
  - Purchase feed from reputable sources
  - Minimize fence line contact with neighboring animals
  - Do not place cattle of different ages in the same pen
  - Keep records of all disease occurrences
- Purchasing replacement animals
  - Quarantine all new animals for 30-60 days
  - Test new animals for disease
  - Purchase animals from healthy and reputable herds
- Environmental and pest control
  - Provide human foot baths at entrances and exits of confinement facilities
  - Provide timely manure and dead animal removal
  - Keep grounds and feed bunks as dry as possible
  - Have an insect control program in practice
  - Have a rodent control program

- Disinfection
  - Clean and remove as much organic material as possible, before disinfecting
  - Chose a disinfectant that will work against the pathogen you want to control
  - Be aware of any toxic, harmful or corrosive effects of the disinfectant
  - Follow the label on the disinfectant package
- Visitors
  - Minimize the number of visitors to the facility and their contact with animals
  - Be sure all visitors have clean clothing/coveralls, boots, and hands
  - Be sure all vehicles or equipment brought on the farm are disinfected
  - Do not allow foreign visitors on the farm until they have been in the country for 5 days. Do not allow foreign visitors to bring clothing, foods, or accessories they have had in another country onto the farm
- Employees
  - Be sure all employees understand and follow the biosecurity protocol
  - Realize that employee owned animals (horses, dogs, etc) can be a possible source of contamination to your facility.

These statements can be applied to swine, as well as sheep and goats.

## Conducting the activity (DO)

### Activity 1 - Developing a Biosecurity Plan

1. Distribute Handout 1 “How to Develop a Simple Biosecurity Plan”
2. Have youth share their definitions of biosecurity
3. Lead a discussion by asking the following questions (have members write answers on the worksheet):
  - a. What are possible diseases that your animal may come into contact with?
  - b. What is the critical control point or monitoring location for that possible disease?
  - c. What is the corrective action needed to stop or prevent the spread of the potential disease?
  - d. What records should you keep to implement your biosecurity plan?
4. Each biosecurity plan should have the following:
  - a. List of possible diseases
  - b. List of critical control points
  - c. List of methods of protection or corrective action
  - d. List of records to be kept
5. Have members share their plan with others.

### Activity 2 - Internal & External Biosecurity Measures

1. Distribute Handout 2 “Internal & External Biosecurity Worksheet”
2. Distribute Handout 3 “Did you know?”

3. Have members volunteer to read out loud the information on both handouts.
4. Discuss the examples.
5. Distribute Handout 4 “Internal & External Biosecurity Worksheet Questions”.
6. Have members provide examples of internal and external biosecurity measures and complete the table on the worksheet.
7. Encourage members to share examples with others in the group.

### Activity 3- Spreading Disease One Touch at a Time

*Adapted from Dr. Susan Kerr, WSU Extension, What Goes Around Comes Around Biosecurity Activity.*

1. Mark off an area that will contain the entire group. Use rope, chairs or land marks to make boundaries.
2. Have the group assemble themselves inside the boundary. There should be enough room so that everyone can move around freely and not bump into each other too much.
3. Have participants raise both hands above their heads.
4. Choose one participant to be the ‘disease carrier’. Make sure the participant is identifiable (wearing a certain color shirt, or have them carry something to identify themselves as the ‘carrier’).
5. The ‘carrier’ will enter the boundary and wander around randomly. Each time the ‘carrier’ touches a member of the group member, that member drops one arm. If a member is touched twice by the ‘carrier’, they must stop moving around and stand still. Each participant standing still represents a sick individual.
6. The activity continues until all participants within the boundary are sick or the time available has run out (the concept will become apparent within 5-10 minutes).

7. Ask participants the following questions:
- What did they see happening?
  - 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?
  - Are there any similarities between disease transmission amongst animals and disease transmission amongst humans (i.e. catching a cold at school)?
  - How can they reduce the risk of contracting a disease (cold) at school? Is this the same for animals?

#### What did we learn? (REFLECT)

- Ask: What is your definition of biosecurity?
- Ask: What is the difference between external and internal biosecurity?
- Ask: How is animal biosecurity similar to keeping ourselves healthy?

#### Why is that important? (APPLY)

- Ask: Why is it important to prevent diseases rather than treat them? Costs?
- Ask: Do you let your friends borrow your supplies at the Fair (brushes, water buckets, etc.)? Why or why not?
- Ask: Can you spread a disease from your animal to your friend's animal?
- Ask: Evaluating quality assurance of your project is something like looking into a mirror - reflect on your project for a moment. Do you like what you see? More importantly, will the person who purchases your animal like it?

## Resources

- Beef Quality Assurance. (2010). National BQA Manual (pages 14-15).
- Kerr, S. (2015). Biosecurity Activity: What Goes Around Comes Around. Washington State University Extension. <http://vetextension.wsu.edu/wp-content/uploads/sites/8/2015/05/Biosecurity-Activity-What-Goes-Around-Comes-Around1.pdf>
- National 4-H Council. (2005). Beef Helper's Guide. National 4-H Curriculum. BU-08146 (page 17).
- National Cattlemen's Beef Association. (2010).
- Ohio State University Extension. (2011). Management Practices. *Beef resource handbook* (page 12-2 through 12-5).
- Ohio State University Extension. (2008). Caring for Animals. *Goat resource handbook* (pages 159-163).
- Ohio State University Extension. (2011). Caring for Animals. *Sheep resource handbook for market and breeding projects* (pages 136-139).
- Ohio State University Extension. (2000). Quality, Caring for Animals, and Swine Resources. *Swine resource handbook for market and breeding projects* (pages 4-1, 24-1 through 24-4, and Resources 3)
- Pork.org. (2014). Establish and Implement an Effective Health Management Plan. *Youth Pork Quality Assurance Plus Handbook Version 2.0*. Chapter 2 (pages 27-39). <http://old.pork.org/filelibrary/youthpqaplus/2014/ypqahandbook.pdf>

## How to Develop a Simple Biosecurity Plan

*Adapted from: Youth Beef Quality Assurance Program Manual for the Pacific Northwest, PNW 593.  
Chapter 5. Biosecurity. Page 32.*

- 1. Conduct a disease potential analysis.**
  - a. Develop a list of possible diseases that your animal(s) may come into contact with. For example, possible diseases may include ringworm, lice, pneumonia, or foot rot, etc.
  
- 2. Determine monitoring locations/critical control points.**
  - a. Critical control points (CCP) are places at which control or prevention can be applied and are essential to prevent, eliminate, or reduce a disease. The identification of CCP is important in controlling the spread of a disease. An example of a CCP may include the receiving area for new livestock, fence line, feed bunk, or water tank.
  
- 3. Prevent disease spread.**
  - a. The goal of a biosecurity plan is to keep the disease agent from entering and spreading among the herd. Protection may be done in a variety of methods depending on the CCP. For example: increasing immunity of the herd, isolating new animals, quarantining sick animals, using disinfectants, and/or cleaning equipment or clothing. Producers need to determine at each CCP what the correct mode of action is. These actions also need to be understood by all workers within the operation.
  
- 4. Record keeping.**
  - a. Keep records of what was done to facilities and animals. Examples of records may include animal identification, vaccinations given, medications given, visitors, and date of facility cleaning.

**Biosecurity Table 1.** Examples of monitoring locations, causes of disease spread, and corrective actions.

From: Youth Beef Quality Assurance Program Manual for the Pacific Northwest, PNW 593, Chapter 5. Biosecurity. Page 30.

Monitoring locations/critical control points (CCP)	Disease & mode of spread	Corrective action(s)
Fence line	Entry of stray animals Entry of people/visitors Example: respiratory and reproductive diseases	<ul style="list-style-type: none"> <li>• Maintain fences to keep out strays and unknown animals.</li> <li>• Establish fences, gates, signs to stop and inform people.</li> </ul>
Facility entrance	Visitors, clothes, footwear Example: Foot-and-Mouth disease (FMD)	<ul style="list-style-type: none"> <li>• Allow public to enter designated areas away from livestock.</li> <li>• Restrict visitors who have been out of the U.S. in the past two weeks.</li> <li>• Provide protective covers for footwear or on-farm boots and/or on-farm coveralls.</li> </ul>
Barn/receiving pen for newly arrived animals	Animal carrying disease Example: respiratory diseases, lice	<ul style="list-style-type: none"> <li>• Isolate for 2 to 4 weeks.</li> <li>• Know status of herd of origin.</li> </ul>
Vehicles—cars, trucks, motor-bikes, and trailers Parking lot	Manure on or in vehicle (including tires & undercarriage) Example: <i>E.coli</i> , <i>Salmonella</i> , enterotoxaemia.	<ul style="list-style-type: none"> <li>• Restrict vehicles to public area only.</li> <li>• Wash vehicle and tires.</li> </ul>
Farm personnel	Clothes, footwear Examples: <i>E.coli</i> , <i>Salmonella</i>	<ul style="list-style-type: none"> <li>• Wear boots, clothes, or coveralls specific for this farm only.</li> </ul>
Raw feed products and standing water in pen/pasture	Contaminated feed and water Examples: BSE, beef measles, liver flukes, foot rot	<ul style="list-style-type: none"> <li>• Don't feed ruminant-derived protein.</li> <li>• Remove standing water.</li> <li>• Keep dogs, cats, rodents, and wildlife out of feed and feeding areas.</li> </ul>
Feed bunks and water tanks	Personnel Contaminated feed and water Examples: beef measles, <i>Salmonella</i> , and <i>E. coli</i>	<ul style="list-style-type: none"> <li>• Provide clean feed.</li> <li>• Clean out water source often.</li> <li>• Provide restrooms for personnel.</li> </ul>
Manure/bedding pile	Contaminated manure in feed and water Examples: <i>E.coli</i> , flies	<ul style="list-style-type: none"> <li>• Use separate tractor bucket to move feed and manure.</li> <li>• Don't apply lagoon water to hay or grazing areas.</li> </ul>
Equipment box/tack room	Brushes, combs, etc. Examples: ringworm, lice	<ul style="list-style-type: none"> <li>• Clean equipment.</li> </ul>
Pastures/common allotments	Animals Examples: brucellosis, leptospirosis, BVD	<ul style="list-style-type: none"> <li>• Vaccinate.</li> </ul>
Squeeze chute Clip chute	Needles and equipment Example: anaplasmosis	<ul style="list-style-type: none"> <li>• Exchange needles and clean equipment.</li> </ul>

Use Table 1 above to help fill in the following blanks to make your own Biosecurity Plan for your livestock animal:

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### BIOSECURITY PLAN

(insert your name)

- What are possible diseases that your animal may come into contact with?
  - *Examples: Blackleg, Brucellosis, BSE, BVD, Enterotoxaemia, Flies, Foot Rot, Lice, Liver Fluke, Trichomoniasis, Ringworm, Warts, Other?*
  
- What is the critical control point or monitoring location for that possible disease?
  - *Examples: Feed bunk/pan, water tank, fence line, barn, squeeze/clip chute, manure pile, pasture, vehicles, equipment box, other?*
  
- What is the corrective action needed to stop or prevent the spread of the potential disease?
  - *Examples: Vaccinations, isolating new animals, quarantining sick animals, using disinfectants, cleaning equipment, wear clean clothing, feed proper and clean feed, cleaning feed storage area, clean water, other?*
  
- What records should you keep to implement your biosecurity plan (attach records to this plan)?
  - *Examples: vaccinations given, date equipment was cleaned, etc.*

## QUALITY ASSURANCE: BIOSECURITY – HANDOUT 2

### Internal and External Biosecurity Worksheet

*Adapted from: Establish and Implement an Efficient and Effective Health Management Plan. Youth Pork Quality Assurance Plus Handbook Version 2.0. Chapter 2. Pages 30-32.*

#### External Biosecurity:

- Control wildlife and pests to prevent contact with your animal(s) by including the use of perimeter fencing and bird screening.
- When contemplating the purchase of new animals, ask your veterinarian to discuss the health maintenance program you should start when the new animals get to your home.
- When possible, establish an isolation facility for quarantining new animals at your home that is remote and/or isolated from the existing herd. During the quarantine period, observe and test for diseases, vaccinate, medicate, and acclimate the new animal as recommended by your veterinarian
- Limit the number of visitors to your facility and minimize their contact with your animals. Question visitors about recent contact with other animals.
- Consider supplying disposable plastic boots to all visitors. Require everyone to at least wash hands, before entry to animal areas.
- Change clothes and boots after visiting other farms, livestock markets, or Fairs.
- Limit use of equipment and tools, including scales, to those that have been cleaned and disinfected if they have been used on another farm or ranch.
- Clean and disinfect your truck and trailer after each use.

#### Internal Biosecurity:

- Work with your veterinarian to periodically survey your animals for different disease challenges.
- When possible, operate all-in/all-out (AIAO) with cleaning and disinfecting between groups of animals.
- Establish a traffic pattern for both animals and people that prevents exposure of younger animals to older animals, their manure or people who have recently been in contact with them.
- Develop a routine check of all equipment and have an emergency plan for feed and water delivery.
- Provide dedicated boots and coveralls at strategic sites in the pen. Wash hands when boots and coveralls are changed. Because boot disinfection is sometimes difficult, disposable boots may be better if regular boots cannot be dedicated to a single site.



## **Did You Know?**

*Adapted from: National Beef Quality Assurance Program Manual, page 15*

### **Infectious Disease can be Spread by:**

- The introduction of diseased animals or healthy animals incubating a disease.
- Introduction of healthy animals who have recovered from disease but are now carriers
- Vehicles, equipment, clothing, and shoes of visitors or employees who move between herds.
- Contact with inanimate objects that are contaminated with disease organisms.
- Carcasses of dead livestock that have not been disposed of properly.
- Feedstuffs, especially high risk feedstuffs which could be contaminated with feces.
- Contaminated water (surface drainage water, etc.)
- Manure handling and aerosolized manure and dust.
- Non-livestock (horses, dogs, cats, coyotes, raccoons, other wildlife, rodents, birds, and insects).

**QUALITY ASSURANCE: BIOSECURITY – HANDOUT 4**

**Internal and External Biosecurity Worksheet Questions:**

*Adapted from: Establish and Implement an Efficient and Effective Health Management Plan. Youth Pork Quality Assurance Plus Handbook Version 2.0. Chapter 2. Pages 30-32.*

**Name an example of External Biosecurity:** *Isolation of new animals to test for unwanted diseases that are not already in your herd.*

**Name an example of Internal Biosecurity:** *Stopping the movement or cross-fostering of baby piglets that have diarrhea.*

**Read the description below and identify the statement as an internal or external biosecurity measure:**

<b>Biosecurity Measure</b>	<b>External</b>	<b>Internal</b>
Locate new animals away from livestock herds and major transportation routes		
Work with your veterinarian to regularly survey your animals for different diseases challenges		
Control wildlife and pests to prevent contact with your animal(s).		
Establish an isolation facility for quarantining new animals to your home, farm, or ranch.		
Operate all-in/all-out with cleaning and disinfecting between groups of animals.		
Limit the number of visitors to your facility.		
Establish a traffic pattern for both animals and people that prevents exposure of younger animals to older animals, their manure, or people who have recently been in contact with them.		
Develop a routine check of all equipment and have an emergency plan for feed and water delivery.		
Minimize visitors' contact with your animals.		
Supply disposable plastic boots to all visitors.		
Change clothes and boots after visiting other farms, livestock markets, or Fairs.		
Wash hands when boots and coveralls are changed.		
Use disposable boots if regular boots cannot be dedicated to a single site at your home, farm, or ranch.		
Limit use of equipment and tools to those that have been cleaned and disinfected if they have been used on another farm or ranch.		
Clean and disinfect your truck and trailer after each use.		