HFHA Biosecurity Learning Module 3 Screenshots:
Finding Sources of Disease Transmission

Screenshots of all module layers. Each screen is numbered in the order it appears in the module. Section 2 (separate document) includes accessibility screenshots for participants using screen readers.

1

2

3
To prepare for your investigation, select each image to review some basic information:

**Disease Factors**
- Agent
- Environment
- Host

**Routes of Infection**
1. Ingestion
2. Inhalation
3. Breaks in Skin
4. Through Cuts

**Means of Transmission**
- Direct Contact
- Indirect Contact

To find out what happens when these interact with each other, drag and drop the circles so they overlap.

**Disease Factors**
- Agent
- Environment
- Host

To find out what happens when these interact with each other, drag and drop the circles so they overlap.
Disease Factors
For disease to happen, we need three factors:

To find out what happens when these interact with each other, drag and drop the circles so they overlap.

A disease agent
Agent
Disease
Environment
Host
A susceptible host

The right environment that brings the agent and the host together

To prepare for your investigation, select each image to review some basic information:

Disease Factors
Agent
Disease
Environment
Host
Means of Transmission
Direct Contact
Indirect Contact

Routes of Infection
1. Ingestion
2. Inhalation
3. Breaks in Skin
4. Insects
5. Mucous Membranes

For each of the routes in the pie chart below, give an example of a situation that could cause infection.

1. type your example here
2. type your example here
3. type your example here
4. type your example here
5. type your example here

Submit
Animal with respiratory disease licking non-infected animals
Using a contaminated hoof trimmer
Animals with skin diseases rubbing against other animals
Being bitten by a mosquito carrying a disease
Pregnant cows with the BVD virus giving birth to infected calves
Grooming an animal with an infected brush
To prepare for your investigation, select each image to review some basic information:

- **Disease Factors**
  - Agent
  - Host
  - Environment

- **Means of Transmission**
  - Direct Contact
  - Indirect Contact

- **Routes of Infection**
  - Ingestion
  - Respiration
  - Skin
  - Other Routes

Select “Next” to continue.

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**Biosecurity Clues to Look For**

As you walk around the farm, think about possible sources of disease agents and how they can spread disease. Examine these pictures, decide if each one poses a direct or indirect disease transmission risk, and then move it to the correct column.

<table>
<thead>
<tr>
<th>Direct Contact</th>
<th>Indirect Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please complete activity to continue.
### Clues to Look For

As you walk around the farm, think about possible sources of disease agents and how they can spread disease.

Examine these pictures, decide if each one poses a direct or indirect disease transmission risk, and then move it to the correct column.

People on the farm are also at risk of zoonotic disease transmission from direct contact with animals. However, in this module, we will be focusing on ways disease can spread through indirect contact with people.

<table>
<thead>
<tr>
<th>Direct Contact</th>
<th>Indirect Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal to Animal</td>
<td>People on the Farm</td>
</tr>
<tr>
<td>Equipment, Vehicles, and Facilities</td>
<td>Contaminated Feed and Water</td>
</tr>
</tbody>
</table>

### Ask Yourself These Questions

What questions should you ask yourself when trying to find ways disease agents could spread?

In this activity, you are creating a list of questions you can use to help find sources of disease transmission. It’s rather long, but you will be using this list to complete upcoming activities, so hang in there!

Move each question to the picture of the corresponding transmission method.

- Are young susceptible animals put on a pasture previously used by older animals?
- Do trunks or cans coming onto the farm come from another farm?
Printout: Questions to Consider When Investigating Points of Potential Disease Transmission

- **Direct animal to animal contact**
  - Do new animals have the opportunity to pass diseases to healthy animals on the farm?
  - Do sick animals on the farm have contact with healthy animals?
  - Are wildlife prevented from coming into contact with farm animals?
  - Are animals separated according to age?

- **People on the Farm**
  - Are there rules about farm visitors with dirty clothes and boots?
  - Are farm workers carrying disease agents from their animals at home to the farm?
  - Are workers carrying disease agents from sick animals to healthy animals while working on the farm?

- **Contaminated feed and water**
  - Is manure contaminating animals’ feed or water?
  - Is feed and water protected from contamination by rodents, birds, cats, and insects?
  - Do young susceptible animals share a pasture with older, possibly infected animals?

- **Equipment, Vehicles, and Facilities**
  - Do trucks or cars coming onto the farm come from another farm?
  - Are equipment and tools used on the farm spreading disease agents?
  - Are the areas where animals are housed clean and disinfected?
  - Are equipment and tools loaned to or borrowed from other farms?
Biosecurity Risk Report

Farm Owner: Dave and Debbie Olson
Date: _______________

Biosecurity Investigator: ____________________ Livestock type: Dairy

<table>
<thead>
<tr>
<th>Sources of Potential Disease Transmission</th>
<th>What is the risk?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You will complete this report as you complete your tour of the farm and identify points of risk.

Start by filling in your name and today’s date.

It’s time to explore the farm and locate the sources of disease transmission risk. There are four areas to explore. Your goal is to locate 24 points of risk. Click next to begin your exploration.

Bred Heifer Barn, Old Barn, Barnyard

Take a look around. Click on the photos and the magnifying glasses for more information. You might want to refer to your list of investigative questions for clues.

There are six potential sources of disease transmission that can be found within the four places to explore in this area.

Tip: Not everything shows a risk...
Bred Heifer Barn, Old Barn, Barnyard

Take a look around. Click on the photos and the magnifying glasses for more information. You might want to refer to your list of investigative questions for clues. There are six potential sources of disease transmission that can be found within the four places to explore in this area. (Here: Not everything shown is a risk)

*Click "Close" to go to the next screen
Bred Heifer Barn

Om! You made it! Glad to see you again. This is where we keep our heifers. I come by here morning and night to check on them.

Before you come into the barn, could you please put on those shoe covers? Thank!

Click on each picture of an individual animal before leaving the section.

In here we’ve got a few heifers, like that one over there. It either keeps getting sick or just never really gets over being sick. I think I’ll wait till they calve and see how much milk they give before I decide what to do with them. Ooops - be careful. Watch out for those razor-sharp horns behind you.
Biosecurity Risk: Bred Heifer Barn, Old Barn, Barnyard

Find the six potential sources of disease transmission from the options below. When you're done, click on the REVIEW button below.

- I wonder if there's enough airflow in this barn.
- Could you please put on those shoe covers?
- "I'm delivering the new heifer we picked up at the sale barn."
- Watch out for those rodent traps!

**Biosecurity risks:**
- Chronically sick animals
- Borrowed bull
- New or returning animals
- Poor ventilation
- Vehicle in barn
- Contaminated facilities

The following items actually **reduce** the risk of disease transmission:
- Rodent traps
- Hand washing station
- Shoe covers
- Restricted access sign

Select REVIEW to review your selection.
Let's explore the risks.

Drag each statement of risk to the colored box at the bottom of the page that describes the source of disease transmission.

Correct!

Select "NEXT" to continue.

See next page for Drag and Drop interactions.
<table>
<thead>
<tr>
<th>Drag Item</th>
<th>Drop Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continually contaminate the environment and other animals.</td>
<td>Chronically sick animals</td>
</tr>
<tr>
<td>Large pig farms usually control air quality with automatic fans because it's so important.</td>
<td>Poor ventilation</td>
</tr>
<tr>
<td>Fairly common practice in small beef and dairy herds but not common in large dairy or beef herds.</td>
<td>Borrowed sire</td>
</tr>
<tr>
<td>Purchasing livestock from auction yards is a high-risk activity and good way to introduce diseases to a herd.</td>
<td>New or returning animals</td>
</tr>
<tr>
<td>Concrete and metal facilities, such as used in large scale pig farms, make cleaning and disinfecting easier.</td>
<td>Contaminated facilities</td>
</tr>
<tr>
<td>Lack of quarantine for incoming animals allows new animals to spread disease to existing animals.</td>
<td>New or returning animals</td>
</tr>
<tr>
<td>Chronically ill or carrier animals may exist in large beef cattle herds because cows may only be seen closely during calving, calf weaning, vaccination, and transport.</td>
<td>Chronically sick animals</td>
</tr>
<tr>
<td>Vehicles, tires, and/or driver’s shoes could be contaminated and spread disease agents.</td>
<td>Vehicle in barn</td>
</tr>
<tr>
<td>Facilities that are not cleaned and disinfected regularly (or have surfaces difficult to clean and disinfect, such as wood or dirt) can harbor disease-causing agents.</td>
<td>Contaminated facilities</td>
</tr>
<tr>
<td>Very common practice with small pig farms, sheep, and goats.</td>
<td>Borrowed sire</td>
</tr>
<tr>
<td>Air high in ammonia from urine and feces can irritate linings of the nose, throat, and lungs and increase likelihood of respiratory disease.</td>
<td>Poor ventilation</td>
</tr>
<tr>
<td>Mostly a problem for dairy cattle. Beef, sheep, and goats are outside a lot.</td>
<td>Contaminated facilities</td>
</tr>
<tr>
<td>Taking animals to and from livestock shows is a major health risk.</td>
<td>New or returning animals</td>
</tr>
<tr>
<td>Some animals can carry diseases without showing any signs of illness.</td>
<td>Chronically sick animals</td>
</tr>
<tr>
<td>Possibly a problem for confined animals.</td>
<td>Poor ventilation</td>
</tr>
<tr>
<td>Shared or new breeding males could be carrying diseases that could spread to others.</td>
<td>Pentagon 14</td>
</tr>
<tr>
<td>Sheep and goats with foot rot are often not culled as they should be.</td>
<td>Chronically sick animals</td>
</tr>
<tr>
<td>Water condensation on windows is an indication of poor ventilation.</td>
<td>Poor ventilation</td>
</tr>
</tbody>
</table>
Biosecurity Learning Modules

Here is your Biosecurity Risk Report so far.

Biosecurity Risk Report
Farm Owner: Dave and Debbie Olson Date: 
Biosecurity Investigator: Livestock type: Dairy

<table>
<thead>
<tr>
<th>Sources of Potential Disease Transmission</th>
<th>What is the risk?</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILK BARN, CALF BARN, AND BARN YARD</td>
<td>CONTINUOUSLY CONTAMINATED ENVIRONMENT AND OTHER ANIMALS.</td>
</tr>
<tr>
<td>1. chronically sick animals</td>
<td>CONTINUES CONTAMINATED ENVIRONMENT AND OTHER ANIMALS.</td>
</tr>
<tr>
<td>2. BURROWED BULL</td>
<td>SICK OR NEW BREEDING MUSIC COULD BE CARRYING DISEASES THAT COULD SPREAD TO OTHERS.</td>
</tr>
<tr>
<td>3. New or returning animals</td>
<td>LACK OF QUARANTINE FOR INCOMING ANIMALS ALLOWS NEW ANIMALS TO SPREAD DISEASE TO EXISTING ANIMALS.</td>
</tr>
<tr>
<td>4. Poor ventilation</td>
<td>DRY, DUSTY ENVIROMMENT, BIRD DROPPINGS ARE THE MOST LIKELY CARRIER OF DISEASE.</td>
</tr>
<tr>
<td>5. Vehicles in barn</td>
<td>BIRDS, VERMINS, INFESTATIONS, AND VARIOUS DISEASES.</td>
</tr>
<tr>
<td>6. Contaminated facilities</td>
<td>FATHERS OF CHRONIC DISEASES CAN BE WHERE CONTAMINATED AND SPREAD DISEASES TO OTHERS.</td>
</tr>
</tbody>
</table>

Great! What will you learn in the next area?

Select Next to move to Area B.

Freestall Barn and Milking Parlor
Take a look around. Click on the photos and magnifying glasses for more information.
You might want to refer to your list of investigative questions for clues.
There are seven potential sources of disease transmission that can be found within the three places to explore in this area.

3 Exploration Points left

Click on photos and magnifying glasses for more information.
Freestall Barn

Hi! I'm Matt. Nice to meet you. I have a small dairy farm of my own but I am working here part time and helping out with milking. The extra money sure helps!

(Click on the image of the cow before losing this screen)

I'm just checking on these sick cows before I bring in the other cows for milking. The boss got them from his brother-in-law a couple of weeks ago but now they're off their feed and have some diarrhea. Since we only have one cow calving right now, we moved the isolated cow into the maternity pen. The other sick animals are with the rest of the cows because we really don't have a place to isolate sick cows.

Freestall Barn and Milking Parlor

Take a look around. Click on the photos and magnifying glasses for more information. You might want to refer to your list of investigative questions for clues.

There are seven potential sources of disease transmission that can be found within the three places to explore in this area.

Clues: Not everything is as it seems.

Questions: BACK NEXT
Biosecurity Learning Modules

Foundations of Disease Transmission Risk

Biosecurity in Milk Production

Milking Parlor

Come on in and see our updated milking parlor. Each cow has a chip that is automatically read and matched to her milk. The chips make it possible to test milk and then track any problem back to the source cow. We’ve been happy with it and our workers like it a lot better than our old system.

Click on the image of the milking unit below to view this area.

Exploration Points left
1

Freestall Barn and Milking Parlor

Freestall barn

Explore and click on the map to magnify certain areas.

There are several potential sources of disease transmission that can be found within the three places to explore in this area.

Hint: Not everything shown is a risk.

Sorry, Gotta run - I just came in to grab some vaccines off the table and take them out to the calf hutches.

Questions
CLOSE
Biosecurity Learning Modules
Healthyagriculture.org

Freestall Barn

There you are. Dave told me you were coming today. Welcome to our freestall barn. We’ve been updating it and we’re proud of our new ventilation system. The fans bring fresh air into the barn and get rid of the stale, old air.

Everyone appreciates them - cows and humans alike.

(Click on shelf image on the right-hand side before leaving this screen.)

What? I don’t know where you’ve been walking so you can’t wear those boots and pants into our freestall barn and walking past. You’ll need some clean boots and a stack of clean overalls on the shelf next to the door. See if you can find stuff that fits you. One more thing before you go in could you please sign this log? Right there below the hoof trimmer’s name. We try to keep tabs on who has contact with our cows.

I’ve been talking to our hoof trimmer. He comes by about twice a year to take care of our cows’ hooves. I think he does all the cown in this county.
Biosecurity Risk: Freestall and Milking Parlor

Find the seven potential sources of disease transmission from the options below. When you're done, click on the REVIEW button below.

- "I have a small dairy farm of my own but I work here part time."
- "There's a stack of clean overalls on the shelf."
- "We really don't have a place to isolate sick cows."
- "I've just checking on these sick cows before I bring in the other cows."
- "Vaccines are stored in the garage."
- "Could you please sign this log?"

Biosecurity Risks:
- Inadequate cleaning of clothing, equipment, etc.
- Working with sick animals before healthy
- Not separating sick animals from herd
- Visiting care givers (hood trimmer, vet...)
- No isolation or too close to barn
- Incorrect storage of vaccines
- Employee keeps same type of animals

The following items actually reduce the risk of disease transmission:
- Clean overalls
- Sign in loge
- New ventilation system

Select REVIEW to review your selection.

Let's Explore the Risks: Million Dollar Quiz

What are the risks for the potential disease transmission sources you've identified in the freestall and milking parlor areas? See if you can select the best answer for each question.

If you're having trouble, you have one chance to Ask a Farmer for help, or you can use your 50-50 hints. But use them sparingly. You only have two! Select "Next" to begin the quiz.
Biosecurity Learning Modules

Million Dollar Quiz

Question 1 of 7

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?

- No isolation or isolation too close to barn
- Incorrect storage of vaccine
- Inadequate cleaning and disinfecting of clothing, equipment, and facilities.
- Separate sick animals from herd

Submit

50-50 50-50 Ask a farmer

NEXT

You're right!

Cleaning and disinfecting clothing, equipment, and facilities can prevent diseases from spreading. Large pig farms that are in buildings are usually very careful about cleaning and disinfecting. However, beef cattle, and sheep and goat farms may not be as careful, especially during busy periods of birthing when boots and coveralls aren't changed or cleaned as often as they should be. Owners of small sheep and goat farms should change footwear between the house and barn or their farm and neighboring ones.

Select "Next" to continue.
Biosecurity Learning Modules

Million Dollar Quiz  Question 1 of 7

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?

- No isolation or isolation too close to barn
- Incorrect storage of vaccine

Sorry!
The correct answer is: cleaning and disinfecting of clothing, equipment, and facilities. Thorough cleaning and disinfecting can prevent diseases from spreading. Large pig farms that are in buildings are usually very careful about cleaning and disinfecting. However, beef, cattle, and sheep and goat farms may not be as careful, especially during busy periods of birthing when boots and coveralls aren't changed or cleaned as often as they should be. Owners of small sheep and goat farms should change footwear between the house and barn or their farm and neighboring ones.

Select “Next” to continue.

Million Dollar Quiz  Question 2 of 7

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?

- No isolation or isolation too close to barn
- Incorrect storage of vaccine

Carl
Rises beef cows.

It sure gets busy during birthing season. I just don't have time to change in between births or when I run up to the house for a quick bite to eat!

Select “Next” to continue.

Million Dollar Quiz  Question 3 of 7

Which human activity can spread disease from sick to healthy animals?

- Insects and birds
- Working with sick animals before healthy
- Contaminated feed or water
- Wildlife/domestic animals in barn

Submit

Select “Next” to continue.
Biosecurity Learning Modules

Million Dollar Quiz  Question 2 of 7
Which human activity can spread disease from sick to healthy animals?

- Insects and birds
- Working with sick animals before healthy
- Contaminated feed or water

$1,000,000
$750,000
$350,000
$100,000
$75,000
$35,000
$10,000
$0

You’re right!
Humans hands, clothing and equipment can spread diseases from sick animals to healthy ones. This is why employees on big pig farms are assigned to specific buildings and tasks. It reduces the risk of spreading diseases between barns. But with dairy and beef cattle, too often caretakers treat the scouring calves before going to tend to healthy calves. This is a dangerous habit!
Select “Next” To continue.

50-50  50-50  Ask a farmer

Biosecurity
Finding Sources of Disease Transmission Risk

Million Dollar Quiz  Question 2 of 7
Which human activity can spread disease from sick to healthy animals?

- Insects and birds
- Working with sick animals before healthy
- Contaminated feed or water

$1,000,000
$750,000
$350,000
$100,000
$75,000
$35,000
$10,000
$0

Sorry!
The correct answer is: working with sick animals before healthy ones. Humans hands, clothing, and equipment can spread diseases from sick to healthy animals. This is why employees on big pig farms are assigned to specific buildings and tasks. It reduces the risk of spreading diseases between barns. But with dairy and beef cattle, too often caretakers treat the scouring calves before going to tend to healthy calves. This is a dangerous habit!
Select “Next” To continue.

50-50  50-50  Return to Farmer

Biosecurity
Finding Sources of Disease Transmission Risk

Million Dollar Quiz  Question 2 of 7
Which human activity can spread disease from sick to healthy animals?

- Insects and birds
- Working with sick animals before healthy
- Contaminated feed or water

$1,000,000
$750,000
$350,000
$100,000
$75,000
$35,000
$10,000
$0

To reduce the risk of spreading diseases between barns employees on big pig farms are assigned to specific buildings and tasks.

50-50  50-50  Ask a farmer
Biosecurity Learning Modules

Million Dollar Quiz  Question 3 of 7

Which of the following strategies would you use to prevent sick animals from spreading diseases directly to herd mates?

- Set up handwashing stations
- Store vaccines in a cool, clean, dry place
- Keep barns clear of birds and insects
- Separate sick animals from the herd

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$1,000,000
$750,000
$350,000
$100,000
$75,000
$35,000
$10,000
$0

Submit

---

You're right!
Separating sick animals from the herd will keep them from spreading diseases through their discharges or direct contact. This is a big risk area for sheep and goats because they tend to hide illness, so owners may be slow to identify sick animals. Plus, owners often don't have any isolation areas for sick animals. With beef cattle, there is often a separate pen for sick animals, but water and food sources may be shared with healthy animals. This means sick animals can spread diseases through the shared contaminated feed and water.

Select "Next" to continue.

---

Sorry!
The correct answer is — separate sick animals from the herd. Separating sick animals from the herd will keep them from spreading diseases through their discharges or direct contact. This is a big risk area for sheep and goats because they tend to hide illness, so owners may be slow to identify sick animals. Plus, owners often don't have any isolation areas for sick animals. With beef cattle, there is often a separate pen for sick animals, but water and food sources may be shared with healthy animals. This means sick animals can spread diseases through the shared contaminated feed and water.

Select "Next" to continue.
### Million Dollar Quiz
#### Question 3 of 7

Which of the following strategies would you use to prevent sick animals from spreading diseases directly to herd mates?

- Set up handwashing stations
- Vaccines in a cool, clean, dry place
- Sharon raises dairy goats and sheep for wool.

Sharon explains: This is a big risk area for sheep and goats because they tend to hide illness. It can be hard to identify sick animals. Besides, where am I going to put them anyway? We don’t have a space to isolate them.

#### Question 4 of 7

Which of these is an example of possible equipment, hands, footwear, and clothes carrying disease agents?

- Hoof trimming
- No isolation area
- Incorrect storage of vaccine
- Birds and insects in the barn

#### Submit

#### Question 5 of 7

You’re right!

Hoof trimmers, and other caregivers from outside the farm—especially those that go from farm to farm working with animals—can be carrying disease agents on their hands, footwear, clothing, and equipment.

Select “Next” to continue.
**Biosecurity Learning Modules**

**HealthyAgriculture.org**

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**Question 4 of 7**

Which of these is an example of possible equipment, hands, footwear, and clothes carrying disease agents?

- Hoof trimming
- No isolation area
- Raincoats and boots

**Sorry!**

The correct answer is: Hoof trimming. Hoof trimmers, and other caregivers from outside the farm, especially those that go from farm to farm working with animals, can be carrying disease agents on their hands, footwear, clothing, and equipment.

Select “Next” To continue.

---

**Question 4 of 7**

Which of these is an example of possible equipment, hands, footwear, and clothes carrying disease agents?

- Hoof trimming
- No isolation area
- Dave: Raises dairy cows, age of vaccine

I worry about these other people we hire to come treat our animals. How many other farms have they visited that day?

Select “Next” To continue.

---

**Question 5 of 7**

Sick animals can spread disease directly to their healthy herd mates. Which of these is a source of this type of risk?

- No handwashing facilities
- Hoof trimming
- Poor ventilation
- No isolation area or isolation too close to the barn

Select “Next” To continue.
### Million Dollar Quiz - Question 5 of 7

#### Sick animals can spread disease directly to their healthy herd mates. Which of these is a source of this type of risk?

- No handwashing facilities
- Hoof trimming
- Poor ventilation

---

#### Carl

*Raises beef cows.*

All our cattle are out on pastures. We really should set aside a small pasture away from other areas where we keep animals for sick animals.
Biosecurity Learning Modules

HealthyFarms
HealthyAgriculture

Biosecurity Finding Sources of Disease Transmission Risk

Million Dollar Quiz  Question 6 of 7
What is the risk involved with storing vaccines incorrectly?

- Human hands can carry diseases and spread them to healthy animals
- Sick animals can spread diseases through direct contact
- Contaminated equipment can carry disease

Carl
Raises beef cows.

We keep our vaccines and medicines in a special refrigerator, so no matter the season, we know they won’t get too hot or cold.

[Multiple choice options]

50-50  50-50  Ask a farmer

Million Dollar Quiz  Question 7 of 7
What is the risk of employees keeping the same type of animals at home as those where they work?

- Working with the same species of animals increases chances of spreading diseases
- The workers might not wash and disinfect their hands well before coming to work
- The workers might have dirty shoes or clothes
- All of the above

Submit

[Multiple choice options]

50-50  50-50  Ask a farmer

Million Dollar Quiz  Question 7 of 7
What is the risk of employees keeping the same type of animals at home as those where they work?

- Working with the same species of animals increases chances of spreading diseases
- The workers might not wash and disinfect their hands well before coming to work

You’re right!
All of the above are correct. Employees who have the same species of animals at home as where they work could bring animal diseases to work with them on their hands, footwear, or clothes.
Select “Next” To continue.

[Multiple choice options]

50-50  50-50  Ask a farmer

NEXT
Biosecurity Learning Modules

Healthyagriculture.org

Million Dollar Quiz  Question 7 of 7

What is the risk of employees keeping the same type of animals at home as those where they work?

- Working with the same species of animals increases chances of spreading diseases
- The workers might not wash and disinfect their hands well before coming to work

Sorry! All of the above are correct. Employees who have the same species of animals at home as where they work could bring animal diseases to work with them on their hands, footwear, or clothes.

Select “Next” to continue.

Biosecurity Learning Modules

Healthyagriculture.org

Million Dollar Quiz  Question 7 of 7

What is the risk of employees keeping the same type of animals at home as those where they work?

- Working with the same species of animals increases chances of spreading diseases
- The workers might not wash and disinfect their hands well before coming to work

Paulita

Raises pigs.

Think about it this way. Which one isn’t right?

Biosecurity Learning Modules

Healthyagriculture.org
Calf Hutches

Looks like you're going around the farm! Well, as you can see, these are our calf hutches. They help keep the calves healthy by keeping them somewhat isolated. Our staff also make it easier for us to feed and care for the calves. We always seem to have customers hanging around the calves hoping to get some milk.

I was just in the milking parlor checking the quality of the colostrum we feed our newborn calves. Now I've got to vaccinate the calves before we sell them. I'm trying to stick to the vaccination schedule that we gave you.

Oh... There's the truck driver I've been waiting for. I need to direct him where to go. The milk truck has to drive through the calf hutch area in order to get to the calf area gate and pick up these cows back there.
<table>
<thead>
<tr>
<th>24</th>
<th>Biosecurity Learning Modules</th>
<th>HealthyFarms HealthyAgriculture</th>
</tr>
</thead>
</table>
| 24 | Calf Hutches

Take a look around. Click on the photos and looking glasses for more information.

You might want to refer to your list of investigative questions for clues.

In this area you need to identify five potential sources of disease transmission.

(*Note: Not everything shown is a risk*)

**Questions**

CLOSE
Story Problems - Matt

We have a lot of wildlife around including fox, raccoons, skunks, bats, rats and mice. The stress score if right in the middle of our crops, and smaller mammals go in and out of our patches all the time. All of these animals, including our dogs and cats, can carry diseases.

Wildlife can contaminate grain, livestock, grains, and some animals can spread diseases by eating the crops. The most effective way to protect farm animals is to keep them inside, which keeps the wildlife out. It's pretty easy to do with large pig farms and some dairy farms, but it's impossible when animals outside most of the time like beef cattle, sheep, and goats.

Wildlife can spread diseases to farm animals by direct and indirect means of transmission.

- True
- False

Wildlife spreading diseases to farm animals isn't much of a problem for which type of farm:

- Large sheep farm
- Cattle ranch
- Large pig farm
- Small dairy farm

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Biosecurity Learning Modules

Story Problems - Matt

We have a lot of wildlife around including foxes, raccoons, skunks, bats, rats and mice. I’ve seen deer living right in the middle of our cows, and smaller mammals go in and out of our pastures all the time. All of these animals, including our dogs and cats, can carry diseases. Wildlife can contaminate grazing land, groundwater, grain, and some animals can spread diseases by biting the cows. The most effective way to protect farm animals is to keep them inside, which keeps the wildlife out. It’s pretty easy to do with large pig farms and some dairy farms, but it’s impossible when animals are outside most of the time like beef cattle, sheep, and goats.

Wildlife can spread diseases to farm animals by direct and indirect means of transmission.

- True
- False

Wildlife spreading diseases to farm animals isn’t much of a problem for which type of farm:

- Large sheep farm
- Cattle ranch
- Large pig farm
- Small dairy farm

Select “NEXT” to continue.

Let’s explore the risks: Story Problems

To explore the risks shown in the cell hatch area, click on each picture and listen to what each person has to say. Then, see if you can answer the questions based on the information you’ve been given.

Right now we keep our cattle much too close to our calves. Those cattle would eat a lot of farms in a day and who knows what they’d do through. They could carry serious diseases from one farm to another. The cattle themselves could spread diseases to our calves. We need to set aside some space for the culled animals that’s far away from our healthy animals.

Pick two reasons why cull animals should be kept away from healthy animals:

- Cull animals can spread diseases to healthy animals.
- Animals get upset when they are near sick animals so they won’t eat well.
- Trucks picking up the cull animals can carry diseases from other farms and animals.
- Animals are scared of the moving trucks and might try to escape.

Submit
Right now we keep our bull animals way too close to our calves. These bull trucks visit a lot of farms in a day and who knows what they drive through. They could carry all sorts of diseases from one farm to another. The bull animals themselves could spread diseases to our calves. We need to set aside some space for the ailed animals far away from our healthy animals.

Pick two reasons why bull animals should be kept away from healthy animals:
- Bull animals can spread diseases to healthy animals
- Animals get upset when they are near sick animals so they don’t eat well
- Trucks picking up the bull animals can carry diseases from other farms and animals
- Animals are scared of the rendering trucks and might try to escape

Submit

Correct!

Select “NEXT” to continue.

Let’s explore the risks: Story Problems

To explore the risks shown in the calf hutch area, click on each picture and listen to what each person has to say. Then, see if you can answer the questions based on the information you’ve been given.
We have a large pig farm and we are VERY strict about cleanliness.

As you know, the fastest way to spread diseases between animals and between animals and humans is with contaminated hands. That’s why our workers must wash their hands before handling any pigs.

Washing hands is harder to do when animals are out on pastures like on cattle ranches, and sheep and goat farms, where there might not be soap, sinks, or even running water.

Which of these strategies is the best way to prevent spreading disease agents from humans to animals?

- Isolate sick animals from healthy animals.
- Have handwashing facilities in all the areas where people work with animals.
- Don’t hire employees that keep the same type of animals as are on the farm.
- Have visitors sign a log book.

Which type of animal operations usually have the best set up for handwashing?

- Beef cattle and pig
- Goats and sheep
- Sheep and dairy cattle
- Dairy cattle and pigs

Correct! Handwashing also prevents spread of disease from animals to humans.

Incorrect. The correct answer is Have handwashing facilities in all the areas where people work with animals.
Biosecurity Learning Modules
Healthyagriculture.org
Did you know you can carry diseases in and on your body that may not make you sick but could infect other people or animals? Pests that cause diseases are attached to other people and animals are called disease agents. Disease agents can stay attached to other people and animals for weeks and months. That's why it's important to wash your hands before. You can carry disease agents inside your body that can infect other people and animals and wash your hands when you return. If you work on a farm or with livestock, wash your hands after touching an animal or its feed or bedding. If you have to leave the farm, wash your hands before you get back on the farm and put on clean clothes over your clothes.

Visitors can carry disease agents inside their body that can infect other people and animals.

- Blood
- Disease agents
- Water

Which of these operations usually has strict rules about visitors?

- Beef cattle farms
- Large pig farms
- Sheep farms
- Goat farms

Correct!
Let's explore the risks: Story Problems
To explore the risks shown in the calf hutch area, click on each picture and listen to what each person has to say. Then, see if you can answer the questions based on the information you've been given.

Cleaning out bird nests and keeping mice and rats out of the barn seems like a full time job, but it's really important because they can carry diseases and they also bring in diseases carrying insects like ticks. Some of our livestock are very sensitive to disease and often die by pooping in their or scrotal. If the feed isn't protected from flooding, rodents, and birds, it could be contaminated with Salmonella, E. coli, Campylobacter, and toxoplasmosis. Our feed and water sources are both protected and kept in metal containers.

Storing feed in sealed feedbags is a safe way to keep feed from becoming contaminated.

- True
- False

Common sources of contaminated feed or water include:
- Cows
- Birds
- Mice
- All of the above

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Biosecurity Learning Modules
HealthyAgriculture.org

29

Back pasture

Well, how has your day been? Pretty slow, isn’t it. I like to finish off my day looking at the cows out on the pasture. It’s so peaceful. Of course, some of these cows belong to my neighbor. Seems like our cows like to converse over the fence.

(Clink on the farmer’s picture before having this screen.)

Sometimes, I walk the pasture looking for hens in the fences, dead animals, what have you. Earlier today, I heard an abrupt call. It was easy to find because a number of the cows were barking. I saw WOW add to my compost pile.

I can’t believe! It’s a real problem when it comes to spreading disease. It’s always a challenge to keep them away from the cows.

I guess you all need my help too. I hope forward to you biosecurity report. You know, we do not do anything spontaneous; they use a management plan to control Johne’s disease on our farm. If you are interested, I can give you some tips for management plans.

P.S. If you see any issues, please drop me a line. Thanks again. I hope it has been a productive and educational day for you all. We’ll talk again short for your report. Safe travels.

28

Back pastures

Take a look around. Click on photos and magnifying glasses for more information. You might want to refer to your list of investigative questions for clues.

In this area you need to identify six potential sources of disease transmission. (Hint: Not everything shown is a risk!

29

Manure compost

Oh, you must be the best thing that’s happened. I didn’t know you were going to be here with me. I’m Carlene. How’s it going? Bet you’re wondering what I’m doing. Any one can see, our manure pile is in overgrowing up. I’m using this tool shown in more area of it to the compost area. Right now, it’s just sitting there to put all that manure.

I think it has been a long time, but you started to compost it. I understand instead of paying to have them handled off. Just thought I’d give this area again to cover things up a bit.

Sorry, I can’t really do it now. I need to finish up. Someone else needs to clean them to feed the cows.
Back pastures

Take a look around. Click on photos and magnifying glasses for more information. You might want to refer to your list of investigative questions for clues. In this area you need to identify six potential sources of disease transmission. (Hint: Not everything shown is a risk!)

Biosecurity Risk: Back Pasture and Manure Storage

Find the six potential sources of disease transmission from the options below. When you're done, click on the REVIEW button below.

Our vet did a risk assessment and together we created a management plan to control Johne’s disease on our farm.
Biosecurity Risk: Back Pasture and Manure Storage

Biosecurity risks:
- Fence line contact
- Insects and birds
- Abortions
- Shared equipment
- Poorly managed compost pile
- Improper manure management

The following item actually reduces the risk of disease transmission:
- Doing a risk assessment and implementing a management plan for Johne’s disease is a big step in creating a biosecure farm. Many strategies to control Johne’s disease serve to control many other disease agents as well.

Select REVIEW to review your selection.

Let’s explore the risks: Matching

Each source is represented by a bulletin board. See if you can pin each risk on the best bulletin board.

Correct! Select “NEXT” to continue.

Poorly Managed Compost Pile
- Composting can be a biosafe way to deal with the bodies of dead animals. A pile is constructed and managed properly.

Improper Manure Management
- Manure can be a source of disease pathogens, particularly bacteria and parasites.

Shared Equipment
- Vehicles driving on farm roads may be contaminated with dirt and manure and carry disease agents with them.

Insects and Birds
- Many diseases can be spread by nose-to-nose contact.

Abortions
- The fetus, placenta, and birth fluids can contain disease agents and they lie on the ground where other animals can snort or lick them, spreading the disease.

Fence Line Contact
- Insect vectors pass diseases from one animal to another through biting or breaking through the skin of animals and humans.

Bucks and rams get out a lot, especially during mating season and cross fence lines.
### Biosecurity Risk Report

**Farm Owner:** Dave and Debbie Olson  
**Biosecurity Investigator:** [Text Entry] 22%  
**Date:** [Text Entry] 21%  
**Livestock type:** Dairy

<table>
<thead>
<tr>
<th>Sources of Potential Disease Transmission</th>
<th>What Is the Risk?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unkilled barn, old farm, and livestock</td>
<td>Disease agents can be spread by man-to-man contact and normal contact with contaminated soil and water.</td>
</tr>
<tr>
<td>Feet, nose, and mouth</td>
<td>Disease agents can be spread by man-to-man contact and normal contact with contaminated soil and water.</td>
</tr>
<tr>
<td>Feed &amp; water</td>
<td>Disease agents can be spread by man-to-man contact and normal contact with contaminated soil and water.</td>
</tr>
<tr>
<td>At-risk animals</td>
<td>Disease agents can be spread by man-to-man contact and normal contact with contaminated soil and water.</td>
</tr>
<tr>
<td>Exposed equipment</td>
<td>Disease agents can be spread by man-to-man contact and normal contact with contaminated soil and water.</td>
</tr>
<tr>
<td>Poorly managed computer file</td>
<td>Disease agents can be spread by man-to-man contact and normal contact with contaminated soil and water.</td>
</tr>
</tbody>
</table>

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**Congratulations,**  
**Investigator cvbxbxxv!**

You've completed your mission!

---

**Congratulations!** You've completed your mission and located 18 of the 24 sources of disease transmission on the dairy farm. We encourage you to go through the module as many times as you'd like in order to master the content. You have identified many examples of these common means of disease transmission: animal to animal, people on the farm, equipment, vehicles, & facilities, and contaminated feed and water. Once you find the points of risk, you can develop strategies and practices to minimize the risk of disease transmission. The next module will help you learn to do just that!
Congratulations, Investigator! You’ve completed your mission!

You’ve completed your mission and located %cumulativeCounter% of the 24 sources of disease transmission on the dairy farm.

We encourage you to go through the module as many times as you’d like in order to master the content.

You have identified many examples of these common means of disease transmission: animal to animal, people on the farm, equipment, vehicles, and contaminated feed and water.

Once you find the points of risk, you can develop strategies and practices to minimize the risk of disease transmission.

The next module will help you learn how just that!
## Biosecurity Risk Report

**Farm Name**: Dave and Debbie Olson

**4-H Investigator**

**Livestock type**: Dairy

### Heifer barn, old barn and barnyard:
- Continuously contaminate environment and other animals.
- Some animals can carry diseases without showing any signs of illness.
- Shared or new breeding males could be carrying diseases that could spread to others.
- Lack of quarantine for incoming animals allows new animals to spread disease to existing animals.
- 4-H Shows, auction market buying, breeder shows are the most likely cause of disease introduction.
- Very big issue for all species!
- Air borne in ammonia from manure can initiate lesions of the nose, throat, and lungs and increase chance of respiratory disease.
- Vehicles, tires, or driver’s shoes could be contaminated and spreading disease agents.
- Facilities that are not cleaned and disinfected regularly (or are difficult to C & D, such as wood structures or dirt floors) can harbor disease-causing agents, a build-up of “bad” bugs can overwhelm the resistance of an animal and cause disease.

### Freestall barn and Parlor:
- Inadequate cleaning of clothing, equipment, etc.
- Poor ventilation
- New or returning animals
- Vehicle in barn
- Contaminated facilities
- Clothing, equipment, etc. can carry and spread disease agents to healthy animals.
- Workers can carry disease agents from sick animals on their hands and clothing and spread them to healthy animals.
- Sick animals can spread disease agents through direct contact and with their discharges (sneezing, coughing, saliva, urine, feces).
- Caregivers often go from farm to farm and can carry disease agents on their hands, clothing, and equipment.
- Sick animals that are housed too close to healthy area can spread disease agents by direct and indirect contact.
- Temperatures that are too high or too low can inactivate vaccine so they don’t work.
- Needles left in the cap of vaccines can introduce bacteria that can make animals sick.
- Workers may carry diseases from their animals to their employers animals.

### Calf Hutches:
- Visitors (dirty boots and clothes)
- Contaminated feed or water
- Wild/domestic animals around livestock
- Lack of handwashing facilities
- Calf animal pick up too close to livestock
- Can spread disease agents directly.
- Can carry disease agents on boots and clothes.
- May have disease agents from manure.
- Birds and rodents can contaminate feed or water with urine and feces.
- Many diseases are shared between wild and domestic animals with livestock.
- Diseases can spread between animals and humans by contaminated hands.
- Calf calves can stop at multiple farms a day, transporting disease agents from one to another.
- The sick animals themselves can spread disease agents to healthy animals.

### Back Pasture:
- Fence line contact
- Flies and birds
- Aborted calves
- Shared equipment
- Poorly managed compost pile
- Improper manure management
- Disease agents can be spread by nose-to-nose contact and fecal contaminated grass and feed.
- Vectors and biths can carry disease agents from sick animals to healthy on their bodies and toes.
- Animals can pick up disease agents by sniffing and licking aborted tissues and fluids.
- Equipment shared between tasks (like moving manure and moving feed) or between farms can carry and spread disease agents.
- Scavenger animals can carry pieces of carcasses to other locations, spreading disease agents.
- Manure is a source of disease agents, especially botulism and paratuberculosis.
- Poor management puts animals at risk of infection.