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BIO-SECURITY in 4-H Animal Science

A Project Curriculum ◆ Volunteer Guide for 4-H Youth Ages 9–11

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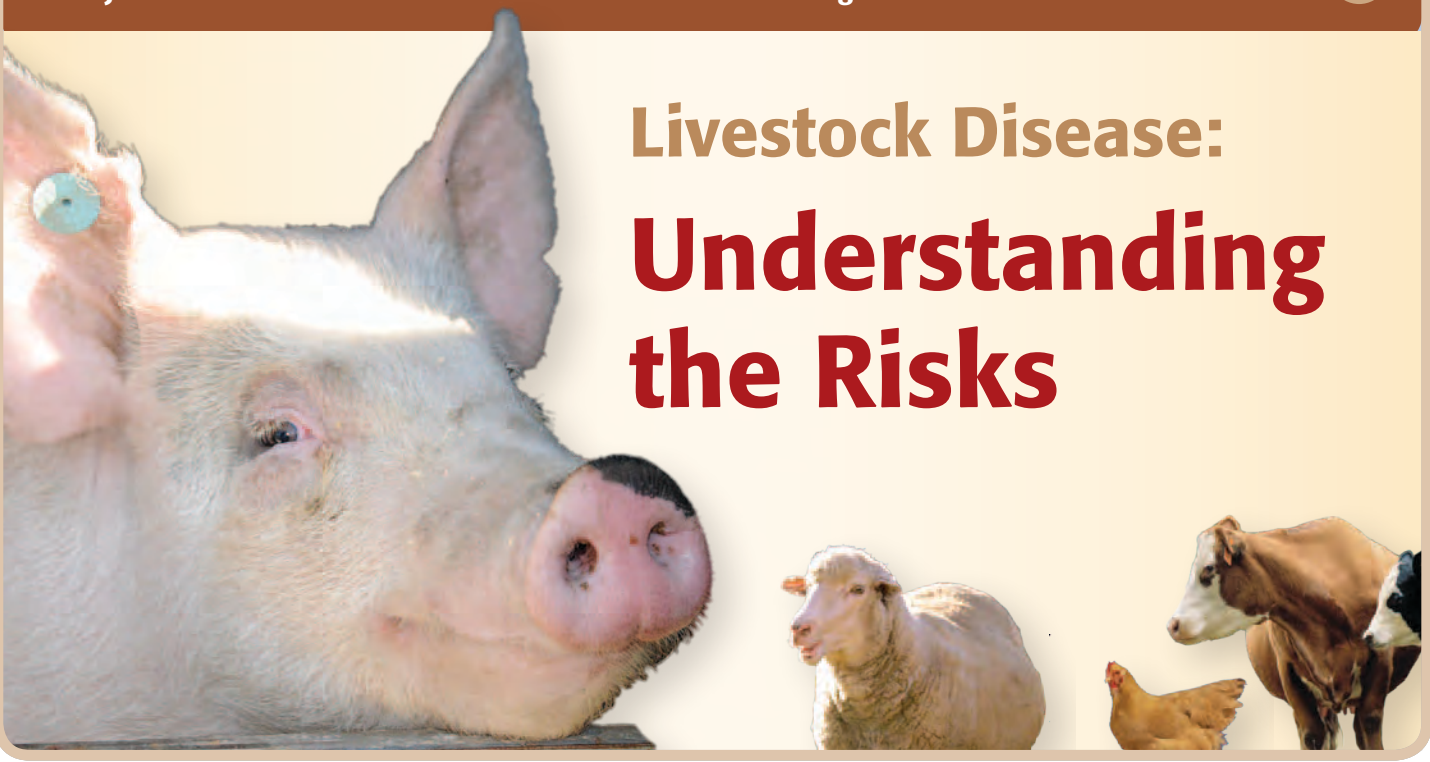

Livestock Disease:

Understanding the Risks

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Curriculum Overview

Animal Science projects are a cornerstone of the 4-H Youth Development Program. Many 4-H youth enroll in these projects, and the majority focus on the rearing and husbandry of market animals, including poultry, ruminants, and swine.

The activities in Module 1 of this curriculum teach youth how contagious diseases spread among livestock. Module 2 focuses on recognizing and addressing disease risks that are present at home or at any given fair or livestock event. Modules 3A and 3B (choose one or the other for your group) have activities that address the issue of tracking animal movement, including the use of Global Positioning System (GPS) technology in 3B.

Activity 1

Understanding and Assessing Risks

Subject Overview and Background Information

In any situation or environment, there is always the chance that an organism will get infected with a disease. This is considered the **disease transmission risk.** Infectious diseases can be spread by a variety of means. One means is through **direct contact,** which involves physical contact between an ill person or animal and a healthy person or animal. A brief moment of contact can allow pathogens to travel from one organism to the next. **Indirect contact** occurs when an uninfected person or animal touches the contaminated surface of an inanimate (non-living) object. For humans, this might be doorknobs, tabletops, or handrails; for domesticated animals, it could be a food dish, a watering dish, or housing materials (e.g., bedding). Any inanimate objects (e.g., clothing, vehicles, shoes, equipment) that can transmit a disease from one animal to another (or human) are called **fomites** (pronounced *fo*-mites).

Airborne transmission is a means of contamination for some diseases. Microbes travel from one person or animal to another through the air and can infect others through their respiratory tract (nose, windpipe, and lungs). For example, if airborne pathogens are released when a sick person or animal coughs or sneezes in an enclosed room, pathogens can be carried via air currents and uncontaminated individuals who are in the same room may be at risk of catching the illness by breathing in the contaminated air.

Fecal-oral transmission refers to the spread of pathogens that affect the digestive system of humans or other animals. These microorganisms enter the body of an uninfected individual through the mouth by means of food or water that has been contaminated by the feces of an infected individual.

Many diseases are spread by **vectors** (any organism that carries and transmits a disease but does not have the disease itself is a vector). Insects are common disease vectors. For example, mosquitoes can carry the pathogens that cause malaria, West Nile virus, and encephalitis. Because vectors are mobile, they can increase the range of a disease, spreading it to new areas.

One way to try to reduce the risk of transmitting or catching a disease is to conduct a **disease transmission risk assessment.** This type of risk assessment evaluates where and how a disease can possibly be spread among humans and animals.

Activity Concepts and Vocabulary

- **Airborne transmission:** Exchange of pathogens that are carried by the air, as pollen and dust.
- **Bio-security:** Precautions taken to protect a living thing (e.g., humans, animals, or plants) from attack or interference due to biological organisms that have the potential to cause the harm. A less formal definition for bio-security is "Keeping the bad bugs off the farm."
- **Direct contact:** Physical contact between an ill person or animal and a healthy person or animal.
- **Disease transmission risk:** The relative likelihood, depending on the situation or environment you or your animal is in, that the animal will catch a disease.
- **Disease transmission risk assessment:** A formal process for evaluating the likelihood that a disease will spread or infect either humans or animals, or both.
- **Fecal-oral transmission:** The entry of disease-causing organisms into the body when an animal eats food or water that is contaminated with the feces of an infected animal. These organisms, which multiply

and leave the infected animal through its feces, also increase the chances that it will infect another animal.

- **Fomites** (pronounced: *fo*-mites): Any non-living (inanimate) object that can transmit a disease pathogen (e.g., clothing, shoes, equipment, etc.).
- **Indirect contact:** When an uninfected person or animal touches the contaminated surface of an inanimate object (e.g., a food dish or tabletop) that has previously come into contact with an infected person or animal.
- **Vector** (pronounced: *vek*-tor): An organism (such as an insect) that carries disease-causing microorganisms from one host animal to another.

Life Skills

- **Head:** Learning to learn, keeping records, critical thinking.
- **Heart:** Cooperation, communication, sharing.
- **Hands:** Teamwork, self-motivation, contribution to group effort.
- **Health:** Disease prevention.

California Educational Content Standards

- Third Grade:
  - ✓ Life Sciences and Investigation and Experimentation – 3a, 3c, 5e
- Fourth Grade:
  - ✓ Life Sciences – 3b, 3d
- Fifth Grade:
  - ✓ Life Sciences – 2a
- Sixth Grade:
  - ✓ Investigation and Experimentation – 7e

Subject Links

Science and Language Arts.

Purpose of Activity

The purpose of this activity is to have youth learn about risks associated with some common diseases of farm animals. Youth will determine the different risks associated with the diseases and why they are considered risks and will develop ways to reduce the risks.

The youth will also be given a *Risk Assessment Tool* that can be used to assess their project animal's risk of contracting a disease.

Overview of Activity

Both humans and animals can contract diseases. Some diseases might affect a wide variety of species; others might only affect one species or a few. No matter what disease it is, however, it is important to assess the risks that people or animals will contract it. Once the risks have been identified, it is easier to prevent or reduce the chances that anyone will get sick or transmit the disease elsewhere.

This activity focuses on a few diseases that farm animals may contract. By reviewing the different descriptions provided in the activity, youth will have an opportunity to analyze a variety of risks associated with these diseases. They will also be provided with a *Risk Assessment Tool* that they can use on their own animals.

Time Required

60 minutes.

Suggested Grouping

Pairs or small groups of 3 to 4.

Materials Needed

(* = *Materials provided in curriculum*)

- * *Common Farm Animal Diseases (See appendix)*
- * *Common Farm Animal Diseases: Ways to Reduce Risks (See appendix)*
- * *Disease Risk Worksheet (See appendix)*
- * *Disease Risk Worksheet Samples 1–4 (See appendix)*
- * *Risk Assessment Tool (See appendix)*
- Flip chart paper
- Pencils, pens, or markers

Getting Ready

- Make enough copies of the *Common Farm Animal Diseases* handout to give one to each group.

- Make enough copies of the blank *Disease Risk Worksheet.* Groups will probably need more than one.
  - ✓ **Volunteer Tip:** Instead of using the *Disease Risk Worksheet,* volunteers can create the table on the white board or flip chart paper.
- Make enough copies of the *Risk Assessment Tool* to give one to each youth.
- Prepare the flip chart paper so each group has one sheet. Make sure there are enough pencils, pens, or markers for each youth to have one.

Opening Questions

1. **What does the term "risk" mean to you?** Ask the youth to write their thoughts and ideas on the paper provided.
2. **What do you think of when you hear the word "disease?" What do you think are some ways a disease can spread from one person or animal to another?** Ask the youth to write their thoughts and ideas on the paper provided.
3. **What do you think are some types of risks associated with catching illnesses (e.g., colds or flu)? When are some times we are at risk for catching a disease or illness? What are some things we can do to lower these risks?** Ask the youth to write their thoughts and ideas on the paper provided.
4. **When and how do you think you can tell that animals are at risk for catching a disease? What do you know about different diseases that animals can get? What are some things we can do to lower an animal's risk of catching a disease?** Ask the youth to write their thoughts and ideas on the paper provided.

Procedure (Experiencing):

1. Distribute one *Common Farm Animal Diseases* handout and the *Disease Risk Worksheet* to each group.
2. Designate someone in each group to read the disease description while the others listen quietly and jot down notes about the description on the *Disease Risk Worksheet* or flip chart paper. (**Note:** Switch roles with each disease description.)
3. After reading the disease description, have the youth fill out the *Disease Risk Worksheet.* First they should determine how the disease is transmitted. Then they should explain what the risks are that an animal will contract the disease. Finally, have them list different ways you can reduce the risk that an animal will contract the disease.
4. Once a group has finished filling out the *Disease Risk Worksheet,* pass another disease description to the group along with a new *Disease Risk Worksheet.*
5. If time allows, repeat the previous steps until each group has had the opportunity to assess each disease on the *Common Farm Animal Diseases* handout. They should fill out a new *Disease Risk Worksheet* for each disease.
6. Once all groups are done, have each group share the results from their worksheets.
7. Next, distribute the *Common Farm Animal Diseases: Ways to Reduce Risks* handouts. Have the youth compare the information on these to what they wrote on their *Disease Risk Worksheets.* Was anything missing? Was there anything that they wrote on their worksheets that was not mentioned on the handouts?

Sharing, Processing, and Generalizing

Follow the lines of thinking developed by the youth as they share and compare their thoughts and observations. If necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

1. **What risks are similar between the different diseases? What, if any, differences did you notice?**
   - ✓ **Volunteer Tip:** Hand-copy the *Disease Risk Worksheet* on a sheet of flip chart paper and fill in the boxes as each group shares their worksheet results. This will allow the youth to see similarities and differences for each disease.

2. **What patterns, if any, do you notice among the diseases? Please explain.**

Concept and Term Introduction

At this point, volunteers need to ensure that the concepts and terms **airborne transmission, direct contact, disease transmission risk, disease transmission risk assessment, fecal-oral transmission, fomites, indirect contact,** and **vector** have been introduced. (**Note:** The goal is to have the youth develop these concepts through their own exploration and define the terms using their own words.)

Concept Application

1. Pass a copy of the *Risk Assessment Tool* out to each individual. Review this tool with the youth and make sure they understand the different components of the tool and how to use it.
2. Ask the youth to review the tool and see if there are any additional risk factors they would like to add to the tool. If so, have them discuss these new additions at the next meeting.

References

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Activity 2

Risk Assessment: A Picture Says a Thousand Words

Subject Overview and Background Information

When performing a **bio-security risk assessment** of your premises and practices, it is important to assess the risk that you will be infected by a disease, the risk that your animals will be infected by a disease, and the risk that the disease will be transmitted to other animals or humans. For example:

If you are working with animals, how likely is it that you are going to come into direct contact with the animals? If the likelihood is high, protective clothing (e.g., gloves, coveralls) might be recommended.

- If you are cleaning a stall or pen, what is the likelihood that you will come into contact with fecal matter? If the chances are high, you might want to consider shoe covers and goggles in addition to gloves and coveralls.
- Is the barn where your animal is housed well ventilated? If not, a mask that covers your nose and mouth might be recommended.

In addition to these assessments, there are a number of **hygiene** practices you should follow as a general rule:

- Change the animals' food and water regularly, and keep your animals' feeders and waterers clean.
- After working with your animals, sanitize your hands as well as shoes, clothing, and any equipment you used, to help reduce your risk of exposure.
- Overall, be alert about your surroundings and the levels of sanitation there.

Activity Concepts and Vocabulary

- **Bio-security:** Precautions taken to protect a living thing (e.g., humans, animals, or plants) from attack or interference due to biological organisms that have the potential to cause the harm. A less formal definition for bio-security is "Keeping the bad bugs off the farm."
- **Hygiene** (pronounced: *hahy*-jeen): A condition that is conducive to the preservation of health (e.g., cleanliness) or a practice that enhances that condition.
- **Risk assessment:** The examinatinon and evaluation of the potential hazards associated with a given situation.

Life Skills

- **Head:** Learning to learn, keeping records, critical thinking, problem solving.
- **Heart:** Cooperation, communication, sharing.
- **Hands:** Teamwork, self-motivation, contributions to group effort.
- **Health:** Disease prevention.

California Educational Content Standards

- Third Grade:
  - ✓ Life Sciences and Investigation and Experimentation – 3a, 3c, 5e
- Fourth Grade:
  - ✓ Life Sciences – 3b, 3d
- Fifth Grade:
  - ✓ Investigation and Experimentation – 6g
- Sixth Grade:
  - ✓ Investigation and Experimentation – 7e

Subject Links

Science and Language Arts.

Purpose of Activity

The purpose of this activity is to have youth observe different animal picture stories and, through the use of the *Risk Assessment Tool,* determine what risks the animals may face.

Overview of Activity

We are constantly in contact with and exposed to organisms that can cause diseases. Our goal is to try to reduce the chances of infection, and the first step toward that goal is awareness. There are many things we do every day and many situations in the environment that can increase our chances of getting sick. Simple awareness of your actions and your surrounding environment can promote good health for both you and your animals.

Another important tool to keep us healthy is the ability to assess the risks of contracting an illness in a given environment. Where are different risks the greatest? When are we taking excessive risks? Which risks are worth taking? Who or what can carry and pass on a disease, and how might a person reduce or prevent that risk?

This activity provides youth with an opportunity to practice their observational and risk assessment skills through the use of pictographic stories and a *Risk Assessment Tool.* Once they have practiced and improved their skills they will have the opportunity to assess what risks their own project animals might face.

Time Required

60 minutes.

Suggested Grouping

Pairs or small groups of 3 to 4.

Materials Needed

(* = *Materials provided in curriculum*)

- * *Animal Stories: Sheep Story, Swine Story,* and *Dairy Cattle Story (See appendix)*
- * *Animal Story Risk Worksheet (See appendix)*
- * *Risk Assessment Tool (See appendix)*
- Flip chart paper
- Pencils, pens, or markers

Getting Ready:

- Make enough copies of the *Animal Stories* so that every group can assess at least one. Cut the stories as shown into "pages."
- Make enough copies of the *Animal Story Risk Worksheet* to give each group one.
- Make enough copies of the *Risk Assessment Tool* to give each youth one.
- Make enough copies of the *Animal Story Risk Worksheet* to give each youth one (this will be used after the activity; see *Concept Application* on page 8).
- Make sure each group has flip chart paper and enough pencils, pens, or markers to give each youth one.

Opening Questions

1. **When you become ill, how might you determine where, when, or how you got sick?** Ask the youth to write their thoughts and ideas on the paper provided.
2. **What do you think are some situations that increase the chances that you will get sick?** Ask the youth to write their thoughts and ideas on the paper provided.
3. **What are some ways you can think of to reduce the chances of getting sick?** Ask the youth to write their thoughts and ideas on the paper provided.
4. **When your animal becomes ill, how might you determine where, when, or how it got sick?** Ask the youth to write their thoughts and ideas on the paper provided.
5. **What are some situations that you think might increase the likelihood of your animal getting sick?** Ask the youth to write their thoughts and ideas on the paper provided.
6. **What are some ways you think you could reduce the chances of your animal getting sick?** Ask the youth to write their thoughts and ideas on the paper provided.

Procedure (Experiencing)

1. Provide each group with the first cut-up page of their *Animal Story.* The group should read the story, look at the picture, and record important findings on their *Animal Story Risk Worksheet.* While reading the story and observing the picture, have the youth use the *Risk Assessment Tool* to help them determine what potential risks are shown in the picture.
2. When a group has completed the first cut-up page, have them return it and give them the second cut-up page. Have them read the story and observe the picture, compare it with the *Risk Assessment Tool,* and record important findings on their *Animal Story Risk Worksheet.*
3. Continue this procedure until every group has observed and assessed all of the pages of their *Animal Story.*
4. If there is enough time, give groups a different *Animal Story* and repeat steps 1 through 3.
5. Have each group share their story, their observations, and the findings that they recorded on their *Animal Story Risk Worksheet.*

Sharing, Processing, and Generalizing

Follow the lines of thinking developed by the youth as they share and compare their thoughts and observations. If necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

1. **What were you looking for while observing the Animal Stories?** Ask the youth to write their thoughts and ideas on the paper provided.
2. **Were there any similarities between the stories? If so, what were they? Were there any differences? If so, what were they?** Ask the youth to write their thoughts and ideas on the paper provided.
3. **How did you determine whether or not there was a potential risk?** Ask the youth to write their thoughts and ideas on the paper provided.
4. **Can you see any themes that are common to all of the stories? If so, what are they?** Ask the youth to write their thoughts and ideas on the paper provided.
5. **Provide the youth with the *Disease Risk Worksheet Samples 1–4.* Ask them to compare the information on the *Animal Story Risk Worksheet* they used for their stories with the samples.** What, if any, new ideas did they discover from the worksheets?

Concept and Term Introduction

At this point, volunteers need to ensure that the concepts and terms **bio-security, risk assessment,** and **hygiene** have been introduced. (**Note:** The goal is to have the youth develop these concepts through their exploration and define the terms using their own words.)

Concept Application

1. If participating youth have a project animal, encourage them to use the *Risk Assessment Tool* to assess the environment to which their animal is exposed. Have them use the *Animal Story Risk Worksheet* to fill in potential risks that they have found.
2. If you raise market animals, consider determining the following:
   - ✓ What might I need to change about the way I raise and care for my animal to reduce bio-security risks?
   - ✓ What might I do to decrease bio-security risks the next time I transport my animal?
   - ✓ What are some changes I could make to reduce risks to bio-security when I take my animal to a fair or show?
3. Provide youth with copies of the appendix *Common Farm Animal Diseases* and *Common Farm Animal Diseases: Ways to Reduce Risks* so they can use them to help reduce risks when raising their project animals.

References

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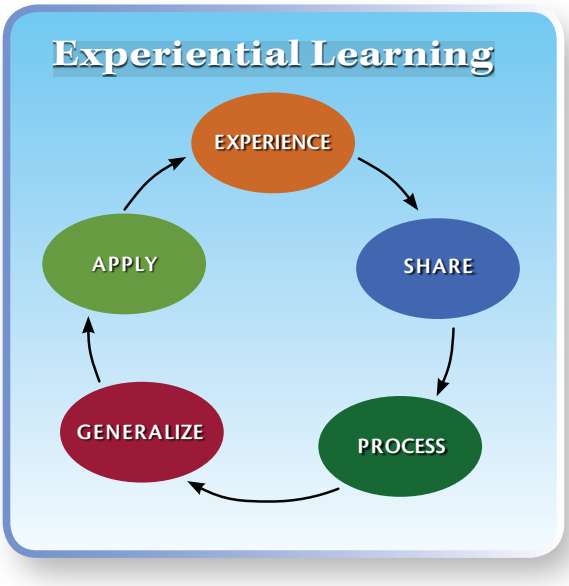
The University of Vermont. Animal biosecurity. http://www.uvm.edu/~ascibios/?Page=animal.html&SM=submenuanimal.html

APPENDIX

The activities in this curriculum were designed around inquiry and experiential learning. Inquiry is a learner-centered approach in which individuals are problem solvers investigating questions through active engagement, observing and manipulating objects and phenomena, and acquiring or discovering knowledge. Experiential learning (EL) is a foundational educational strategy used in 4-H. In it, the learner has an experience phase of engagement in an activity, a reflection phase in which observations and reactions are shared and discussed, and an application phase in which new knowledge and skills are applied to real-life settings. In 4-H, an EL model that uses a five-step learning cycle is most commonly used. These five steps—Experiencing, Sharing, Processing, Generalizing, and Application—are part of a recurring process that helps build learner understanding over time.



For more information on inquiry, EL, and the five-step learning cycle, please visit the University of California Science, Technology, and Environmental Literacy Workgroup's Experiential Learning Web site, http://www.experientiallearning.ucdavis.edu/.

Common Farm Animal Diseases

Swine Dysentery

Swine dysentery (SD) is a disease that is caused by bacteria and is very expensive to treat. This disease usually affects pigs that that weigh 12 to 75 kg (26 to 165 lb). Sows and piglets can be infected, but boars and gilts are more common.

Pigs can carry and release the SD bacteria in their feces over extended periods of time. Healthy pigs can accidentally eat infected feces found in their feed, water, or bedding. The bacteria can survive outside of a pig for up to 8 weeks if the environment is cool and damp.

One way SD is transmitted is through introduction of an infected animal into an existing herd of healthy animals. The disease can also be transmitted to healthy pigs through **fomites**—objects such as vehicles, clothing, or shoes that have come into contact with the SD bacteria and so can pass along the disease. Swine dysentery can also be transmitted to pigs by other types of animals. Birds, flies, mice, and dogs can act as **vectors,** carrying the SD bacteria in their feces and infecting pigs without being harmed themselves.

When a pig becomes infected, the first symptom is watery diarrhea. Pigs with SD will eat less, lose weight, grow more slowly, and become dehydrated. If the animal is under stress or has a change in its diet, the symptoms can get worse. The diarrhea may become black and bloody. Although death caused by SD is rare, it has been known to happen in severe cases.

Marek's Disease

Marek's Disease (MD) is a viral illness that affects chickens. The disease is found worldwide and typically infects chickens 3 to 30 weeks of age.

Chickens typically contract MD through their respiratory (breathing) system. The virus that causes the illness spreads easily via wind, animals, and fomites (e.g., vehicles, clothing, or shoes). Once a bird is infected with the virus, it will have the disease for the rest of its life and will constantly spread the MD virus through dander (small dandruff-like scales) from the base of its feathers. The virus can survive at moderate temperatures for more than a year and may be resistant to certain types of disinfectants.

There are three different forms of MD, each with specific symptoms. One form is *neurological MD,* which affects the nervous system and can cause short-term or long-term paralysis of the bird's legs or wings as well as eye abnormalities such as paleness or lesions (wounds). A second form, called *visceral MD,* affects internal organs, causing tumors in different parts of the body such as the heart, muscles, and lungs. A third form is known as *cutaneous MD* because it causes tumors (growths) in feather follicles (the part of the bird's skin where feathers form).

Other symptoms of MD may include weight loss and unthriftiness (e.g., lowered egg production). Marek's Disease can be fatal, and birds may or may not show signs of the illness upon death.

Club Lamb Fungus

Club Lamb Fungus is caused by a fungus and is contagious to sheep, humans, and other animals. The disease is spread by spores that are released by the fungus and it infects other animals or humans through direct contact with infected animals or indirect contact via contaminated bedding or housing or other fomites (e.g., trucks, trailer, or grooming tools). The fungal spores can survive in the environment for a long time, often several years.

Sheep commonly contract Club Lamb Fungus through direct and indirect contact at fairs, shows, and sales events. The disease is also easily transmitted when sheep are shorn, since any nicks or cuts can allow the fungus to easily enter the skin. Humans typically are infected through contact with infected sheep.

Symptoms of Club Lamb Fungus usually begin as small circular sores on the head, neck, and back of the animal that grow larger over time. Initially these sores are raised and red; in later stages they grow larger and appear crusty or scaly. Recovery from Club Lamb Fungus

takes 8 to 16 weeks, during which time the animal remains contagious. Contact your veterinarian about fungicides that can be applied to the skin to reduce the spread of the disease.

Coccidiosis

Coccidiosis is an intestinal disease caused by a microscopic parasite that can infect a variety of animals, including goats, sheep, birds, cattle, cats, dogs, and even humans. However, strains of coccidiosis that affect one type of animal (e.g., dogs) will not affect another (e.g., goats). The parasite can survive for extended periods of up to one year outside of a host animal and thrives in cool, dark, moist environments.

The parasite that causes coccidiosis is transmitted from an infected animal to a healthy animal through food or water that has been contaminated with the infected animal's feces. Most animals that are infected with coccidia do not show signs of the disease. However, young animals and those that are under a lot of stress tend to show symptoms. Symptoms may range from mild, watery diarrhea in mild cases to severe, bloody diarrhea accompanied with weight loss, loss of appetite, and dehydration. Severe cases can cause death.

Common Farm Animal Diseases: Ways to Reduce Risks

Swine Dysentery

Some best practices to prevent the spread of SD include

- Preventing a pig's food, water, and bedding from becoming contaminated; keeping food and water fresh; and making certain that the animal's bedding is clean and dry and that the pen, barn, or shed is clean and disinfected.
- Knowing the health history of new pigs when they enter your herd. New pigs should be separated from the rest of the herd for at least 21 days to make sure they don't have any illnesses that could spread to your healthy animals.
- Isolating sick animals from the rest of the herd until the illness can be diagnosed.
- Preventing contact with other swine herds.
- Reducing any unnecessary handling or movement of the pigs to avoid the spread of fecal matter.
- Preventing any overcrowding of pigs in holding areas or pens.
- Wearing clean, disinfected clothing and shoes when working with pigs.
- Cleaning and disinfecting all equipment after you work with your animals; disinfecting vehicles when entering and leaving the farm.
- Washing your hands or changing gloves when you go from working with one pig to working with another.
- Carefully observing your animals, checking on them frequently for any unusual physical symptoms or abnormal behaviors.

Marek's Disease

Some best practices to prevent the spread of MD include

- Purchasing birds that that have been properly vaccinated against MD and are free of the disease.
- Isolating new birds for a specified period of time (contact your veterinarian for an appropriate interval) to make sure they do not have any diseases that might spread to your healthy animals.
- Keeping your birds' enclosure clean and disinfected.
- Preventing contact with other birds and animals.
- Carefully observing your birds, checking on them frequently for any unusual physical symptoms or abnormal behaviors.
- Wearing clean, disinfected clothing and shoes when working with birds.
- Cleaning and disinfecting all equipment after you work with your animals; disinfecting vehicles when entering and leaving the farm.
- Washing your hands or changing gloves when you go from working with one animal to working with another.

Club Lamb Fungus

Some best practices to prevent the spread of Club Lamb Fungus include

- Purchasing sheep that do not have the infection.
- Isolating new sheep for a period of time before allowing them to join the rest of the flock.
- Limiting movement and preventing contact with other sheep.
- Reducing the stocking density (the number of animals kept in an area).
- If an animal is infected, separating it from other sheep.
- Keeping a clean, dry, disinfected facility (fungi grow well in a moist environment).
- Allowing animals to spend time in the sunlight. Warmth will help keep them dry and reduce the spores' ability to survive.
- Carefully observing your sheep, checking on them frequently for any unusual physical symptoms or abnormal behaviors.
- Wearing clean, disinfected clothing and shoes when working with your animals.
- Cleaning and disinfecting all equipment with a fungicide after you work with your animals;

disinfecting vehicles when entering and leaving the farm.

- Washing your hands or changing gloves when you go from working with one animal to working with another.

If you are showing your sheep at a fair or exhibition,

- Examine your animal when you first arrive. If your sheep has cuts or scratches on its skin, remove it from the fair.
- Do not show sheep that have been in contact with animals infected with Club Lamb Fungus.
- Use disposable gloves when handling your animal.
- Keep your animal's bedding clean and dry.
- Limit direct contact with other animals.
- Clean and disinfect all washing, grooming, and shearing equipment after each use.
- Isolate your animal(s) for a period after you return from the fair to make certain they did not contract any diseases while there.

Coccidiosis

Some best practices to prevent the spread of coccidiosis include

- Isolating new animals for a specified period of time (contact your veterinarian for an appropriate interval) before allowing them to join other animals.
- Limiting movement and preventing contact with other animals.
- Reducing the stocking density (the number of animals kept in an area).
- If an animal is infected, separating it from others.
- Keeping a clean, dry, disinfected facility.
- Raising all water troughs and feed buckets off of the ground to help prevent contamination; making certain that food and water are fresh.
- Carefully observing your animals, checking on them frequently for any unusual physical symptoms or abnormal behaviors.
- Wearing clean, disinfected clothing and shoes when working with your animals.
- Cleaning and disinfecting all equipment after you work with your animals; disinfecting vehicles when entering and leaving the farm.
- Washing your hands or changing gloves when you go from working with one animal to working with another.
- Contacting your veterinarian if your animal shows any physical signs of coccidiosis. Certain drugs are effective in treating the disease.

Disease Risk Worksheet

Animal: _____ **Disease:** _____ **Type of Disease:** _____

(e.g., bacteria, virus, parasite, fungus)

List ways the disease is transmitted.	**What are the risks?** (please explain)	**Explain ways to reduce risks to animals and/or humans.**
1. (*For example*, Indirect transmission of a pathogen)	(*For example*, The animal can contract the pathogen by touching an object.)	(*For example*, Sanitize scales between use; sanitize trailers between trips.)
2.		
3.		
4.		
5.		

(Volunteer's Guide)

Disease Risk Worksheet (Sample 1)

Animal: Swine

Disease: Swine Dysentery

Type of Disease: Bacterial

(e.g., bacteria, virus, parasite, fungus)

List ways the disease is transmitted.	What are the risks? *(please explain)*	Explain ways to reduce risks to animals and/or humans.
1. This disease is spread through the feces of infected animals. Infected pigs can shed the bacteria in the feces for long periods of time. So there is a high risk of catching the disease when healthy swine are exposed to other swine. whether it is through the introduction of a new swine to the herd or through transportation or contact with swine from other facilities/herds.	Contact with the feces of infected swine.	• Control for fecal contamination by having a manure management protocol. • Obtain dysentery free pigs: quarantine new pigs for at least 21 days. • Prevent movement or contact with other swine herds. • Don't house the animals close together. • Reduce any unnecessary handling or movement of pigs.
2. The bacteria can be easily picked up by these items. absorbed. and transferred to healthy swine.	Fomites: vehicles. equipment. bedding. clothing. shoes etc.	• Fomites: vehicles. equipment. bedding. clothing. shoes. etc. • Wear clean and disinfected clothing and shoes when working. • Clean and disinfect all equipment between each animal: disinfect vehicles all vehicles when entering and leaving the farm. • Change bedding as often as possible.
3. Fecal matter that carries the bacteria can contaminate food and water. Healthy pigs can eat and drink this contaminated food and water. becoming infected with the disease.	Contaminated food and water	• Maintain a clean and disinfected facility. • Elevate food and water containers to prevent fecal contamination. • Change all water and food as often as possible.
4. Other animals can be vectors of the disease. shedding the bacteria in their feces without being infected themselves.	Animal vectors: Birds. flies. dogs. and mice.	• Prevent movement or contact with outside animals. • Remove. clean. and disinfect any area/equipment in contact with fecal matter.

(Volunteer's Guide)

Disease Risk Worksheet (Sample 2)

Animal: Chickens

Disease: Marek's Disease

Type of Disease: Virus

(e.g., bacteria, virus, parasite, fungus)

List ways the disease is transmitted.	**What are the risks?** *(please explain)*	**Explain ways to reduce risks to animals and/or humans.**
1. This disease is spread by the particles from feathers and can be easily spread via the wind. The wind spread it to everywhere and to everything. It can directly infect animals as well as deposit the virus on fomites and other animals that can come in contact with a healthy flock. Once an animal is infected. it will carry and spread the disease for life.	Wind	• Maintain a clean and disinfected facility. • Obtain birds that are disease free and have been vaccinated against Marek's Disease: quarantine new birds. • Prevent movement or contact with other birds and animals. • Don't house animals closely together. • Reduce unnecessary handling or movement of birds. • Separate young birds from adults until 5 months of age.
2. The virus can easily attach to these items and passed to a healthy flock of birds.	Fomites: vehicles. equipment. bedding. clothing. shoes. food. water. etc.	• Maintain a clean and disinfected facility. • Wear clean and disinfected clothing and shoes when working. • Clean and disinfect all equipment between each animal. • Disinfect vehicles all vehicles when entering and leaving the farm. • Change food. water. and bedding as often as possible.
3. The virus can easily attach to the coat of animals and transferred to a healthy flock of birds.	Animal vectors	• Maintain a clean and disinfected facility. • Prevent any movement or contact with outside animals.

(Volunteer's Guide)

Disease Risk Worksheet (Sample 3)

Animal: Sheep

Disease: Club Lamb Fungus

Type of Disease: Fungus

(e.g., bacteria, virus, parasite, fungus)

List ways the disease is transmitted.	**What are the risks?** *(please explain)*	**Explain ways to reduce risks to animals and/or humans.**
1. This fungus can easily survive in the environment for many years and can be passed by direct or indirect contact with infected animals. This fungus also affects other animals and humans so they can also infect healthy sheep. They can easily enter the animal through its skin, hair follicles, and cuts.	Contact with infected animals and humans	• Maintain clean and disinfected facility. • Obtain disease free sheep; quarantine new sheep. • Prevent movement or contact with other sheep herds and other animals. • Don't house the animals close together. • Reduce any sharp edges or wires in the facility.
2. The bacteria can be easily picked up by these different fomites and pass to healthy swine.	Fomites: vehicles, equipment, food, water, bedding, clothing, shoes, etc.	• Wear clean and disinfected clothing and shoes when working. • Clean and disinfect all equipment with a fungicide between each animal. • Disinfect vehicles all vehicles when entering and leaving the farm. • Change water, food, and bedding as often as possible.
3. The spores of the fungus can easily survive in humid and dark areas for many years.	Environmental conditions	• Provide enough sunlight for animals. • Reduce humid and dark areas.
4. Since the fungus can survive for many years, an animal can become infected if housed in an area that housed infected animals in the past.	Housing area	• Designate housing areas as areas only housing healthy animals and areas only housing infected animals. • Disinfect all housing areas with a fungicide as often as possible.
5. At a fair, animals are in close proximity and even in contact with other animals, which can increase the chance of a healthy animal becoming infected. Equipment is shared between animals, from stalls to grooming equipment, which increases the chances of being infected. Traveling and the fair environment can also cause the animal stress, lowering its defenses against diseases and infections.	Fairs	• Do not share equipment, stalls, water and feed buckets. • Disinfect washing, grooming, and shearing equipment between each animal. • Separate animals that are exhibited at a fair from the main farm flock. • Wash and clip animals as little or as late a possible because the wool protects the animal from fungal infections. • Reduce stress with limited travel, rest, proper nutrition and care.

(Volunteer's Guide)

Disease Risk Worksheet (Sample 4)

Animal: Goats, Sheep, Birds, Cattle, Dogs

Disease: Coccidiosis

Type of Disease: Parasite

(e.g., bacteria, virus, parasite, fungus)

List ways the disease is transmitted.	**What are the risks?** *(please explain)*	**Explain ways to reduce risks to animals and/or humans.**
1. This parasite is spread through the feces of infected animals. It is impossible to completely get rid of the parasite. However, just because an animal has the parasite doesn't mean the animal is diseased. Only when there is a high parasite load and the animal's immune system is suppressed that the animal begins to show symptoms.	Eating the feces of infected swine	• Maintain a clean and disinfected facility. • Control for fecal contamination by having a manure management protocol. • Obtain disease free animals; quarantine new animals. • Prevent movement or contact with other animal herds. Don't house animals close together. • Reduce unnecessary handling/movement; reduce stress.
2. The bacteria can be easily picked up by fomites and passed to healthy swine.	Fomites: vehicles, equipment, bedding, clothing, shoes, etc.	• Maintain a clean and disinfected facility. • Wear clean and disinfected clothing and shoes when working. • Clean and disinfect all equipment between each animal. • Disinfect vehicles all vehicles when entering and leaving the farm. • Change bedding as often as possible.
3. Fecal matter that carries the bacteria can contaminate food and water. Healthy animals can eat this contaminated food and water, becoming infected with the disease.	Contaminated food and water	• Maintain a clean and disinfected facility. • Elevate food and water containers to prevent fecal contamination. • Change all water and food as often as possible.
4. Housing animals in crowded conditions can cause a lot of stress on the animal. This can increase the parasite load and decrease the animal's defense system against diseases.	Intensive husbandry systems and high stocking density	• Maintain a clean and disinfected facility. • Reduce stress. • Prevent overcrowding. • Have a less intensive facility.
5. The parasite thrives in these conditions and can survive in these conditions for more than one year.	Cool, dark, moist environmental conditions	• Maintain a clean and disinfected facility. • Try to maintain a dry and warm facility. • Clean up any damp and moist areas as often as possible. • Allow the animal to be exposed to natural sunlight.

Risk Assessment Tool for Project Animals

Risk factors	Low risk	✔	Moderate risk	✔	High risk	✔
ANIMAL						
Contact with other species (wild and domesticated)	never or seldom		occasionally		frequent	
Quarantine procedures for introduction of new animals	quarantine procedures always used		qarantine procedures sometimes used		quarantine procedures never used	
Vaccinations	all recommended vaccinations		some recommended vaccinations		no recommended vaccinations	
Vaccination status	all current		some current		none	
HUMAN						
Non-owner human contact	never or seldom		occasionally		frequent	
Clothing	protective clothing; only worn in barn; cleaned after each use		protective clothing; only worn in the barn		no specific clothing when working with animals	
Footwear	footwear only worn in barn; disinfected after each use		footwear worn only in barn; cleaned after each use		no specific footwear; footwear not cleaned after each use	
Hand washing	always was hands before and after contact with animals		occasionally wash hands before or after contact with animals		rarely wash hands before or after contact with animals	
HOUSING & TOOLS						
Housing (same species)	animal housed individually		animal housed in small group		animal housed in large group	
Bedding	clean and dry		soiled and/or damp		foul and/or wet	
Vermin and vector control	no visible signs of vector or vermin		some visible signs of vector and vermin		many visible signs of vector and vermin	
Climate (heat, cold, moisture)	minimal exposure to extremes		sometimes exposed to extremes		frequently exposed to extremes	
Air flow	adequate ventilation		some ventilation		no ventilation	
Tools, equipment, vehicles	cleaned and sanitized after each use		cleaned sometimes		rarely or never cleaned	
FOOD AND WATER						
Food quality	food is clean and fresh		food is clean; not fresh		food is moldy, dirty or spoiled	
Water quality	clean water; circulated		clean water; standing		dirty water	
Food and water access	individual food and water		shared food and water		group food and water; many animals	
TRANSPORTATION						
Transportation frequency	rarely or never transported		transported sometimes		transported frequently	
Transportation with animals	always transported alone		only transported with animals from same farm		transported with animals from different farms	

Animal Stories || Sheep Story

Sheep Story, Page 1

Jack decided he wanted to join a 4-H sheep project. His parents and older siblings were already a part of the club and were really excited for him. His parents owned a sheep barn and their sheep just had lambs. Jack wanted to raise a newborn animal for a show. A friend of Jack's older sister had an extra lamb from her sheep breeding project so she gave the lamb to Jack to raise.

Sheep Story, Page 2

Jack housed his new lamb in his parents' barn. When the new lamb first arrived at the housing area, it did not interact with the other sheep. After a few days, however, it moved among the other sheep without any apparent hesitation.

Sheep Story, Page 3

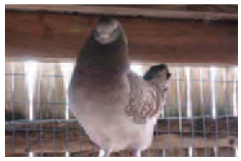
After a few more months, Jack's lamb, now a sheep, was ready to go to a show. Since only a few sheep were going from his club, his parents volunteered to transport all them together in their trailer. It was going to be a long trip and Jack was worried about his sheep. His parents promised him that all the sheep would be just fine.

Sheep Story, Page 4

When Jack got to the fair, he was really excited. There were so many people and so many animals everywhere! He got his sheep out of the trailer and went to the area where they house sheep.

Sheep Story, Page 5

Jack tried looking for a pen to house his sheep, but all of the pens were occupied to the fullest. He asked a volunteer at the show for help and she said the last place available was a pen that already had one sheep and one goat in it. Jack was really happy that he got the last spot and gladly accepted the pen with another sheep and a goat.



Sheep Story, Page 6

Jack noticed that the pen was a little dirty, so he changed the bedding and refilled the water bowl in the pen. After he refilled the food bowl, pigeons immediately flew into the pen and started eating the food. Jack had to wave his arms and shoo the birds to get them away.

Sheep Story, Page 7

It is time for the auction! Jack takes his sheep out of the pen, cleans him up, and leads him to the place where the auction will occur. His parents wave to him from behind the fence and wish him good luck.

Animal Stories || Swine Story

Swine Story, Page 1

Sara learned from her friends at school that doing a swine project was a fun experience and a good way to make some money. She heard about a nearby ranch that did some swine breeding on the side, and convinced her parents to take her to buy a piglet or two. Her parents already had three pigs but thought that Sara would learn a lot by raising her own pig.

Swine Story, Page 2

Sara and her family considered her 4-H project hogs as pets. Once the pigs had made themselves at home, they became another part of the family. Even Sara's little brother Sam liked to go out and see what the pigs were up to.

Swine Story, Page 3

One thing Sara decided to do with her hogs was to take them to different shows so she could practice her showmanship and gain some experience. Because other people in her 4-H group were going to the shows too, they decided it would be easiest to haul their animals together.

Swine Story, Page 4

In the washing area at a show, Sara washed her pig up nice and clean to get him ready for showing. It wasn't so bad for her to get a little wet because it was so hot outside. Her pig didn't seem to mind the scrubdown either.

Swine Story, Page 5

After washing down her pig, Sara went to clean his pen and set it up for him.

Swine Story, Page 6

At the show, Sara's hog was housed with someone else's animal. Here you can see the hogs resting in between shows, waiting for their next meal.

Swine Story, Page 7

It's showtime! Sara gets ready for the show. She takes her pig out of the pen, cleans and wipes it down, and takes it to the arena. Here, Sara is in the arena with her pig, which is being judged.

Swine Story, Page 8

After a long day at the show, it was time to go home. Sara had to find another trailer for her pig because the one her pig had come in originally had already left. Luckily, one of Sara's neighbors was also at the fair and had room for her pig. Sara helped clean the trailer before they put the pigs in.

Animal Stories || Dairy Cattle Story

Dairy Cattle Story, Page 1

Jamie went to visit her friend who was showing her cow at a 4-H fair. After watching the show, Jamie became really interested in the 4-H dairy cattle project and wanted to participate in it. She went to a commercial breeder and picked out a Jersey calf to take home.

Dairy Cattle Story, Page 2

Jamie named her new calf Wonka and decided to take the best care of her, with the goal of taking her to fairs in the future. Jamie's parents also raise dairy cattle calves and allowed Jamie to put her calf in a pen with the other calves. Here, Jamie is seen feeding Wonka milk out of a bottle.

Dairy Cattle Story, Page 3

Once Wonka reached one year of age, Jamie decided it was time for the heifer to go to her first fair. Jamie's neighbor Kim was going to the same fair with her calf, Fluffy, and had a trailer to transport the calf. Jamie asked Kim if she had enough room to take Wonka, too. Even though Kim's trailer was small, there was enough room for both of them. Wonka entered the trailer first, followed by Fluffy.

Dairy Cattle Story, Page 4

It took a long time to get to the fair, so once they arrived, Jamie took Wonka out of the trailer and immediately to the washing area. Jamie wanted to clean Wonka and cool her down before the show. There were other cows already tied to the wash rack, waiting for a hose. Since it was probably going to take a while to get a hose, Jamie tied Wonka next to the other cows on the wash rack and went looking for Wonka's pen.

Dairy Cattle Story, Page 5

Due to the number of cattle entered in the show, Wonka was assigned to be housed with Holstein cows. Jamie used the tools in the pen to put in new bedding, filled the water bowl with clean water, and put in new food. After cleaning the pen, Jamie headed back to the washing area to wash down Wonka.

Dairy Cattle Story, Page 6

Jamie and several other contestants waited as they watched youth from another project show their Holsteins.

Dairy Cattle Story, Page 7

After a long and exciting day at the fair, it was time to go home. Jamie loaded Wonka first and she laid down in the back of the trailer. Kim then loaded Fluffy. Fluffy looked back and "posed" for this photo before the 4-Hers closed the trailer and headed home.

Animal Story Risk Worksheet

Name: _____

Animal: _____

	What are the risks? (Please list.)	**Why are they risks?** *(Please explain.)*	**Explain ways to reduce these risks.**
	(For example: indirect transmission of a pathogen)	(For example: the animal can contract the pathogen by touching an object)	(For example: sanitize equipment between use; sanitize trailers between trips)
1.			
2.			
3.			
4.			

For More Information

You will find related information in other publications, slide sets, CD-ROMs, and videos from UC ANR.

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