

Livestock Biosecurity

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Livestock Biosecurity



BIOSECURITY

1. The implementation of measures to prevent the introduction of disease into a healthy population of animals or limit the spread of disease once introduced.
2. Is critical for a livestock operation because it reduces the risk of the introduction of infectious agents.



BIOSECURITY

3. Is part of a preventive medicine program, farm owners should recognize vulnerabilities to infectious or non-infectious disease agents.
4. Complete biosecurity is difficult to achieve.
 - Biological risk management – A set of best management or whole farm practices.

Biosecurity Principles



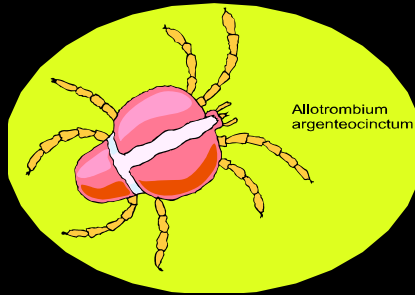
- Biological agents are microorganisms or toxins from living organisms that can cause illness in animals and/or people.
- **Infectious** organisms that can contaminate the body include bacteria, viruses, parasites, and fungi, etc.
- **Contagious** (also referred to as communicable or transmissible) biological agents may spread between animals and/or people

Biosecurity Principles

- **Direct transmission** is when disease is passed through direct contact between animals.
- **Indirect transmission** occurs when disease is contracted from fomites, vectors, alternate hosts, etc.

Biosecurity Principles

- **Indirect contact** may involve the transfer of infectious agents through:
 - An intermediary vector, such as an insect or tick (e.g. West Nile Virus)
 - Inanimate objects called fomites, such as pitchforks, tires, boots, and equipment (e.g. salmonellosis and foot-and-mouth disease)
 - **Zoonotic diseases** are diseases transmitted from an animal to a human and include rabies, scabies, brucellosis (undulant fever), etc.



Biosecurity Principles

- **Foreign animal disease** is a disease that is not believed to occur in the US. The United States Department of Agriculture (USDA) and Animal and Plant Health Inspection Service (APHIS) works with state animal health officials and veterinary professionals to identify, control, and eradicate these animal diseases and mitigate their effects.

Perimeter Fencing

- Perimeter fencing not only keeps animals contained, but also deters trespassers. Other deterrent to criminals include:
 - Adequate lighting or critical structures, anhydrous ammonia and fuel tanks, etc.
 - Elimination of hiding places such as overgrown shrubs and large brush or garbage piles
 - Posted warnings of active video security



Perimeter Fencing

- Locked building (feed storage areas, chemical/fuel storage building, etc.)
- Natural warning systems (e.g. dogs and vocal birds such as guinea hens)
- Night security personnel
- Surveillance cameras

Presence of a Biological Agent

- Symptoms that may indicate the presence of a biological agent and should prompt a response include:
 - Sudden or unexplained deaths in the herd or flock
 - Severe illness affecting a high percentage of animals
 - Blisters around an animal's mouth, nose, teats, or hooves
 - Staggering, falling, or other central nervous system disorders that prevent animals from rising or walking normally.

Recognize the Problem

- **Recognize** the problem. **Avoid** further contamination. **Isolate** the animal to reduce spread of the agent. And, most importantly, **notify** the local veterinarian.

R Recognize

A Avoid

I Isolate

N Notify

Biosecurity Program

- Should vary by operation
- Economics
- Components
 - Resistance
 - Isolation
 - Traffic control
 - Sanitation and disinfection

Resistance and Isolation

- Resistance
 - To infection
 - To illness after infection
 - As a result of vaccination
- Isolation
 - Health monitoring
 - Containment for 28 days

Traffic Control and Sanitation

- Traffic control
 - People
 - Vehicles
 - Animals
- Sanitation
 - Clean, hygienic conditions
 - Clothing, equipment, people, etc.

Routes of Biological Exposure

- Natural
- Accidental
- Intentional

Learning Objectives

- Identify specific vulnerabilities associated with the movement and off-farm housing of animals.
- Analyze the potential risks associated with an off-farm event involving animals.
- Apply biosecurity principles to situations involving the movement and off-farm housing of animals.

Off-Farm Activities/Events

- Precautionary measures at off-farm events can be broken into three broad categories:
 - Pre-event
 - During-event
 - Post-event

On-Farm Pre-Event Precautions

- Sanitation: manure management, clean trailers & equipment, and proper storage and timely disposal of garbage.
- Housing: adequate space, clean bedding, and traffic patterns.
- Environmental control: proper ventilation and temperature control through misting systems in dairies, fans, and heat lamps.

On-Farm Pre-Event Precautions

- Nutrition and health programs: balanced rations, clean water supplies, mineral supplementations, vaccination, deworming, and confirmation of health status of herd of origin.
- Introduction of new animals: health records from the herd of origin, isolation, and Certificates of Veterinary Inspection (CVI).



On-Farm Pre-Event Precautions

- Insect and rodent control: feed storage areas, reduction of standing water, and insecticide programs.
- Carcass disposal: pre-planned site and method, pathogen containment, and feasibility.

On-Farm Pre-Event Precautions

- Traffic control (for both animals and people): designated employee and visitor parking areas, isolation of new animals, and visitor logs. In addition, for feed and supply deliveries: designated parking and delivery times and alternative vendors (in the event of contaminated feed, shortages, etc.)

Off-Farm During-Event Precautions

- Limit animal exposure to new pathogens and diseases via
 - Animal-to-animal contact
 - Human-to-animal contact
 - Sharing equipment
 - Acts of vandalism or agro terrorism

Off-Farm During-Event Precautions



- Limit human exposure to new pathogens and diseases via
 - Touching, petting, and feeding animals
 - Post signs prohibiting those activities
- Prohibit eating and drinking in animal areas
- Post signs encouraging people to wash their hands before eating

After-Event Precautions

- Develop a plan
 - Sell the animals for harvest
 - Alternatively, isolate and monitor animals
 - Minimum 28-day isolation period for most pathogens
 - Isolation facility at a location separate from the home farm
 - Monitor for disease during isolation

After-Event Precautions

- Caring for animals in isolation

Animals with Highest Health Status

**ORDER
OF
DAILY
CHORES**

Animals with Lowest Health Status

Off-Farm Risk Assessment

Agrosecurity Risk Assessment for Off-Farm Animal Events				
Check the most appropriate box				
	Low Risk	Moderate Risk	High Risk	
Animal vaccinations/immunization before off-farm event	Timely, comprehensive plan coordinated with veterinarian	Immunization based on event regulations, but not necessarily part of a comprehensive plan	Haphazard immunization plan that is neither coordinated nor professionally done	
Animal transportation to off-farm event	Haul animals only in personal clean and disinfected truck or trailer	Haul animals in another's truck or trailer that has been cleaned and disinfected	Haul animals in another's truck or trailer without cleaning or disinfection	
Animal housing at off-farm event	Animals penned/stalled separately; solid partitions separate pens/stalls; no or minimal contact with other animals	Animals penned/ stalled separately; open-air partitions separate pens/stalls; minimal contact with other animals	Animals from different farms mixed in pens; substantial animal-to-animal contact	
Outer clothing worn at off-farm event	Clothes and boots worn at event are not worn on the home farm	Clean clothing and disposable boots or cleaned and disinfected boots worn at event and upon return to the home farm	Clothes and boots worn at event also worn on the home farm	
Equipment used at off-farm event	Equipment used at off-farm event not used at home farm	Equipment used at off-farm event cleaned and disinfected before being used at home farm	Equipment used at off-farm event and at home farm without cleaning and disinfection	
Public contact with animals at off-farm events	People prohibited from petting and feeding animals	Allow petting but discourage people from feeding animals	Allow people to pet and feed animals	
Return of animals from off-farm event	Isolate for a minimum of 28 days combined with visual and diagnostic monitoring	Isolate for a minimum of 28 days without visual and diagnostic monitoring	Animals reenter the herd without isolation or visual and diagnostic monitoring	

Adapted from *Biosecurity Risk Assessment for Farm Visitors and Exhibitions* (Veterinary Science Information, Penn State University)

Biosecurity in the Sheep Flock

The Shepherd Magazine

- Biosecure flock – one in which the chance of disease entering either through other sheep or some indirect vector is minimal.



How Biosecure is Your Flock?

- How near is the next sheep flock?
- When you buy replacement animals do you quarantine your animals for 28 days and what else do you do in preparation for getting the new stock?
- Do you have a standard procedure for visitors to your farm?

How Biosecure is Your Flock?

- How do you prepare for shipping your livestock?
- How do you manage your dead animals?
- How do you handle your manure pile?
- How do you manage a large cat problem?

A Biosecure Flock

- The flock will develop immunity to the soup of bacteria and viruses present within it.
- The flock will show improved performance as management and nutrition are more effective.



A Biosecure Flock

- To the buyer of your animals, the fact that you are using biosecurity sends a signal of a conscientious producer who values the flock.
- 4-H/FFA animals will perform at a high level in gain and conformation.



Vulnerability Assessment Check List

On our farm we.....

1. Recognize symptoms of animal diseases that might occur, monitor for them regularly, and incorporate preventive measures against them in a biosecurity plan.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

2. Isolate sick animals until well and isolate new animals or animals returning from an off-farm event for 28 days.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

3. Limit access to animal areas by visitors and off-farm vehicles and have visible biosecurity signage.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

4. Require visitors to wear clean or disposable shoes and outer clothing.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

5. Regularly clean and disinfect vehicles, trailers, and other fomites that may harbor pathogens.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

6. Have an established carcass disposal site or method.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

7. Handle animals with a high health status first and those with a low health status last.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

8. Implement rodent, insect, wildlife, and stray animal control programs.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

9. Have veterinarian submit samples and/or carcasses to a diagnostic laboratory for testing for animals that die unexpectedly.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

10. Monitor feed and water intake of livestock and poultry and actively monitor behavior of animals.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

11. Provide a designated paved or concrete parking area for visitors.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

12. Enforce hand-washing procedures before and after anyone enters animal areas.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

13. Establish health status of origin herds/flocks before purchasing animals and inspect new animals.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

14. Incorporate animal health programs that include vaccinations, proper nutrition, stress reduction, etc.

If response is no:



Vulnerability Assessment Check List

On our farm we.....

15. Minimize fence-line contact between animals and contact between livestock of different age and production groups.

If response is no:



1. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Schedule an appointment with a veterinarian or animal health care professional who can teach techniques on taking temperature, pulse, respiration, capillary refill time and dehydration status (as appropriate to species).
- Contact local Extension personnel and/or a local veterinary practitioner for information about incorporating preventive measures into a comprehensive biosecurity plan.



2. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Design a location to isolate animals away from resident animal population, preferably in an area with no nose-to-nose contact. Have portable fencing or designated barn area available to be able to isolate animals that become sick.
- Provide separate clean feed containers and water supplies to isolated animals and do not share equipment between the isolated animals and the other animals on the farm.



3. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Develop a plan restricting visitor/vehicle access to animal housing areas.
- Establish biosecurity protocols for visitors who must have access to animal housing areas (e.g. veterinarians, Extension personnel, breeders, etc.)



4. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Enforce biosecurity requirements and provide disposable boots and outer garments.



5. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Develop a schedule and written standard operating procedures for cleaning and disinfection of vehicles, trailers, equipment, and stall/barn areas based on the most likely infectious disease risks to the farm. Extension personnel and veterinarians can provide guidance.



6. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Consult Extension personnel, veterinarians, and local and state laws for the best carcass disposal methods and sites for the farm.
- Once the best carcass disposal method has been established for the farm, ensure adequate supplies are available (e.g. fuel for incineration, carbon based materials for composting, etc.).



7. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Group animals by age, use, and risk factors if possible. Then determine the best traffic pattern to work with animals utilizing veterinary and Extension expertise.



8. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Determine which problems currently exist on the farm. Consult Extension publications, Extension personnel, and exterminators for guidance on control programs.



9. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Determine the cause of death of all animals that die unexpectedly.
- Consult a local veterinarian about how to handle carcasses prior to the veterinarian's arrival (e.g. using gloves, keeping carcass away from other animals, temperature issues, etc.).



10. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Watch for behavioral and feed and water consumption changes as they are often the first signs of sickness in animals. Early detection is critical for control and eradication of animal health problems.



11. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Establish a paved or concrete parking area away from animal housing to facilitate cleaning and disinfection of vehicles and to prevent introduction of pathogens into farm soil.
- If creating a paved or concrete parking area is cost-prohibitive, an alternate solution is the use of highway construction filter fabric, shot rock, and limestone.



12. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Provide adequate supplies of soap, warm water, disposable paper towels, and a trash receptacle.
- Post proper hand washing guidelines.



13. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Obtain a recent Certificate of Veterinary Inspection and results from all health tests that are required prior to crossing state lines.



14. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Establish a valid veterinarian-client-patient relationship and follow the veterinarian's advice concerning animal health needs.
- Consult with Extension personnel for information on proper nutrition, stress reduction, etc.



15. Guidelines to Consider Incorporating into an Animal Emergency Action Plan

- Establish buffer zones between neighboring livestock operations and the home herd; avoid shared fences. Implement a wildlife exclusion plan, including special fencing if necessary (e.g. 45° outward angle fencing). Control rodent, stray pet, etc. access to animal housing areas.
- Separate animals by age and production groups to avoid exposure of more susceptible animals to disease pathogens.



Thank You!

Pictures by Thad Gourd and Mike Jarosz

Information from EDEN

