

Unit Fifteen

Disease Outbreak / Public Concern

Overview

In this unit you will learn about disease outbreaks, their impacts, and consequences. You will also learn about how biosecurity mitigates the introduction and spread of disease. We will review how the public perceives the care of animals in disasters and discuss methods to convey factual information to the public.

Objectives

Upon completion of this unit, you should be able to:

- Identify common features among large-scale animal disease outbreaks and natural disasters
- Describe biosecurity measures that reduce the introduction and spread of animal disease
- Identify issues that concern the public about livestock in disasters
- Determine the level of biosecurity on your farm
- Determine your level of preparedness to address public concern about livestock in disasters

Contagious Diseases

Large-scale disease outbreaks are the quintessential disaster. Epidemics result in mass mortality of animals, as well as devastating economic impacts on industries and communities. Some diseases of livestock and poultry can also infect humans, such as *Salmonella*, influenza, and Equine Encephalitis.

The costs of animal disease are due to loss of production, loss of animals, human morbidity and mortality, days of lost work and legal actions. The loss of economic activity in allied industries can be large and may exceed the losses to farms.

A particularly serious disease threat to the livestock and poultry industry in the U.S. and other developed countries is trans-boundary diseases. Trans-boundary diseases, also called Foreign Animal Diseases or List A diseases, are defined by the Office of International Epizootics (OIE), the World Health Organization for Animals as:

“Transmissible <animal> diseases that have the potential for very serious and rapid spread, irrespective of national borders, that are of serious socio-economic or public health consequence and that are of major importance in the international trade of animals and animal products.”

Freedom from List A diseases in a country is proven by the lack of clinical disease and the absence of vaccination against the disease. This explains why we do not vaccinate against List A diseases in the U.S.

List A Diseases of Livestock	
➤ Foot and mouth disease	➤ Vesicular stomatitis
➤ Swine vesicular disease	➤ Rinderpest
➤ Peste des petits ruminants	➤ Contagious bovine pleuropneumonia
➤ Lumpy skin disease	➤ Rift Valley fever
➤ Bluetongue	➤ Sheep pox and goat pox
➤ African horse sickness	➤ African swine fever
➤ Classical swine fever	➤ Highly pathogenic avian influenza
➤ Newcastle disease	

Costs of disease outbreaks

We have seen the staggering cost of List A disease outbreaks in other countries.

In Germany in 1993 and in the Netherlands in 1994 the cost of outbreaks of Classical Swine Fever cost each country more than \$5 billion. In 2001, the outbreak of Foot and Mouth Disease in the United Kingdom cost more than \$6 billion, nearly 0.5 percent of the UK's Gross Domestic Product. The outbreak affected nearly 25 percent of all farms in the UK. Because of the time of year at which Foot and Mouth Disease struck, British tourism suffered greater direct losses than the livestock industry.

An outbreak of Foot and Mouth Disease or Classical Swine Fever (Hog Cholera) in the U.S. would be devastating to the U.S. economy. Rural areas are likely to suffer most. Estimates of the direct cost of a Foot and Mouth Disease outbreak in the U.S. are as high as \$13.5 billion. Indirect costs may be much greater.

The U.S. is free of most List A diseases because it has spent time and resources to eradicate them. (Vesicular Stomatitis and Bluetongue still occur sporadically). The USDA is the lead agency that keeps the U.S. free of List A disease.

Reintroduction of List A diseases could occur naively from tourists or intentionally through bioterrorism. The spread of trans-boundary diseases does not require sophisticated technologies. These diseases are highly contagious and spread on their own. Even a small outbreak that is contained locally can have national and international consequences.

Several changes in recent years have made modern livestock agriculture more susceptible to the spread of disease. Some of these changes were discussed in Unit 2. Additional factors that contribute to the increased vulnerability of the livestock industry to the spread of contagious disease are summarized in table below.

Notifiable Diseases

All suspect findings of List A diseases have to be reported to state or federal veterinarians and are considered "Foreign Animal Diseases (FAD)". Distinct from FAD are notifiable diseases. Examples of notifiable diseases include bovine tuberculosis, Brucellosis, and Johne's Disease. Diseases that are notifiable are often regulated at the state level.

When a Foreign Animal Disease outbreak occurs, local, state and national animal health officials work together with emergency management officials towards the goal of control and eradication.

Change	Effect/Example
Consolidation of the livestock industry	High density of animals in fewer locations
Increased movement and mixing of susceptible populations of livestock at multiple markets	Increased exposure of susceptible animals to disease in multiple geographic regions within a short period of time
Changes in the environment	Decreased availability of wetlands associated with potential for spread of fowl cholera, Newcastle disease and duck plague from wild birds to commercial flocks
Crossing over of agents to new species	Morbillivirus from bats to humans and horses (in Australia), <i>Mycoplasma gallisepticum</i> spread from chickens to house finches
Genetic homogeneity (sameness)	Possible decreased population resistance to disease
Changes in husbandry and management systems	Amplification of exposure to Bovine Spongiform Encephalopathy through the cattle feed supply; e.g. through rendering practices in England

Mitigation of Animal Disease

The following section refers only to animal diseases that are indigenous to the U.S., although similar principles apply to the control of List A diseases. However, List A diseases are also federally regulated and require additional measures for control. (Note the term List A disease is often used interchangeably with Foreign Animal Disease, FAD).

Biosecurity on the farm

A principle of effective disaster preparedness is that everyday preparedness is best for extraordinary events, such as disasters. Similarly, mitigating the consequences of disease outbreaks is best accomplished as part of everyday management practices.

The single most effective action to mitigate disease is biosecurity. Biosecurity involves preventing the introduction of disease to a farm, and reduces the spread of disease within a farm. Biosecurity also prevents disease spreading from one infected farm to another.

In its simplest form, biosecurity involves a comprehensive vaccination program against contagious diseases. Vaccination is an effective measure to protect animals during their movement on and off a farm. Vaccination also reduces the possibility of disease spread among animals that are mixed from different sources.

Perimeter fences that reduce the introduction of animals, fomites (inert objects on which disease is disseminated), and humans to farms are another effective biosecurity method. Fences are useful every day in the prevention of movement of animals on and off farms and are protective in many types of disasters.

Feed and equipment deliveries, and animal delivery and collection ports are potential sites where diseases can be introduced to or disseminated from a farm. These contact points with the “outside” world should be located so that deliveries and dispatch points are separated from animals on the farms.

Delivery and dispatch points should also be located out of floodplains. This allows delivery and dispatch to continue, even after common natural disasters, without compromising the standards of biosecurity on a farm.

Biosecurity of transportation equipment can be further enhanced by keeping trucks and trailers clean. Some producers have opted to use their own trucks for all animal shipments to prevent the potential introduction and spread of disease.

New animal arrivals to a farm should be placed in quarantine until a suitable time has lapsed to rule out the introduction of contagious disease. In some cases, animals should be tested to determine if they are carrying diseases.

Sick animals should be separated from healthy ones. Sick animals should not be housed close to susceptible animals. For example, sick cows should not be housed next to dry cows, and sick pigs should not be kept with gilts. Animals should be grouped together by age and/or use.

Hospital facilities on farms should be kept immaculately clean. All utensils and tools should be disinfected thoroughly between use. This includes thermometers, drench guns, and other hospital equipment. All disposable items should only be used once.

Off the farm

Regulations are a component of mitigation of disasters. In the case of several contagious diseases, mitigating regulations are enforced by either state or federal veterinary agencies.

Disaster preparedness, including preparedness for disease outbreaks, offers an opportunity to work toward a common goal. For example, producers, herd veterinarians, emergency managers, extension agents, and allied industries can jointly develop “what-if” scenarios to identify areas for improvement in mitigation and preparedness programs. This type of collaboration is also effective because the solutions most likely improve when dealing with local issues.

Examples of collaboration are to:

- Familiarize emergency management, law enforcement officials, and veterinarians with transportation routes used for movement of animals, carcasses, feed, and manure
- Develop community biosecurity programs with producers, veterinarians, emergency management, and allied industry
- Develop “reputation management” programs for education of the public in case of a disease outbreak
- Use Natural Resource Conservation Services maps to identify suitable sites for carcass disposal

In general, familiarity by all stakeholders with each other’s resources, objectives, and constraints greatly facilitates an efficient response to a disaster. The resources are discussed in Unit 16.

Impacts and Consequences

Disease outbreaks have many adverse impacts and consequences. Many of these effects are common to other types of disasters. The following table summarizes some of the adverse impacts and consequences that can arise from disease outbreaks and in which units of this course you can learn more about them.

Impact	Consequence	Refer to Unit #
Rumors about the cause of disease and who is at risk are common in disease outbreaks	Communications are challenged	5
Movement of vehicles and people may be restricted because of some highly contagious diseases	Infrastructure failure	6
If large numbers of animals need to be slaughtered on their farm of origin, the slaughter methods may be dangerous	Threat to public and animal safety	7
To reduce losses, some farmers may opt to slaughter their herd	Need to evacuate people and animals	8
Quarantine stations may be needed	Displacement of animals	9
Some animal diseases infect people	Threat to public and animal health	10
Some diseases are contagious to wildlife	Adverse effects on the natural environment and wildlife	11
Many animals may die in a disease outbreak	Need for carcass disposal	12
In some animal disease outbreaks, e.g., Foreign Animal Diseases, policies dictate that healthy animals in farms adjacent to infected ones should be slaughtered	Need for euthanasia	13
Many diseases cause considerable suffering in animals	Threat to the well-being of animals	14
Sick and dying animals evoke sympathetic emotions	Public concern	This unit

Public Concern

Disasters frequently elicit public concern. This is, in part, because disasters are often the basis for human interest stories. Another reason why the public is attracted to disasters is because disasters are intriguing, because they are unpredictable, dynamic, and involve judgments and decisions at times when all the facts are not available.

In the long run, the public's concern about disasters often determine how typical events are handled. In the case of livestock agriculture, everyday issues that worry the public are the safety of the food supply, animal welfare, and the environment. These are also amplified when livestock are involved in disasters.

Confidence in the food supply

The long-term damages that could affect the livestock industry include a lack of consumer confidence in the wholesomeness of food of animal origin. For example, outbreaks of Bovine Spongiform Encephalopathy in Europe and Japan initially resulted in decreases in red meat consumption of up to 80 percent. Since the outbreaks, red meat consumption has remained lower than before the outbreaks.

Misperceptions and actual risks associated with the safety of the food supply in disasters must be addressed immediately. An effective strategy is to develop reputation management programs before disasters strike.

Animal welfare

The public is usually not familiar with animal disease control procedures, such as slaughtering of in-contact herds. During the Classical Swine Fever outbreak in the Netherlands, the Dutch Society for the Prevention of Cruelty to Animals acted in a liaison role by conveying information about animal welfare to the public. This greatly facilitated public calm and allowed control measures (pre-emptive slaughter) to be implemented efficiently.

Environment

During the Foot and Mouth Disease outbreak in the UK in 2001, the initial disposal of carcasses was to burn them. However, this led to a build up of contaminants in the air, which necessitated the burial of large numbers of animals.

Later concerns emerged that material from the decomposing carcasses could leach into the groundwater.

Mitigation of Public Concern

When new diseases emerge, the boundaries of science are challenged. These challenges are a breeding ground for rumors. To minimize the likelihood of rumors developing, everything should be done to ensure public and animal safety and to limit the spread of the disease to people and among animals. In addition, special attention should be given to assuring the public that everything is being done to accomplish these tasks.

Public perception of the overall effectiveness of response to a disaster is often created in the early phases of disaster response, when interest and attention is highest. These impressions can last long after the disaster. Therefore, any delay in conveying a competent and reassuring message to the public about a disease outbreak could have long-lasting negative impacts on public perception.

Public fear can be minimized by coordinating press releases. All official information should be coordinated and released via the Incident Command System (see Unit 16). To ensure that government officials, the media, and other persons receive correct, up-to-date, and appropriate information, a Public Information Officer (PIO) is designated.

The incident commander can also appoint a liaison officer. The liaison officer acts as a diplomat and a point of contact for assisting and coordinating agencies and producers. The liaison officer identifies and provides lines of authority, responsibility, and communication between these groups. The public information and liaison officers should consult with experts on animal care before issuing any recommendations.

Case 1: The mystery disease

One spring in New Jersey, an unusual number of foals were thought to be dying. A local newspaper reporter took a special interest in the case and reported on a “mystery disease” that was “killing many horses and their foals.”

What are your concerns?

How do you think the public would react to this message?

The public’s initial reaction was great concern about suffering in horses. As more media channels reported on the outbreak, many experts were interviewed. While most of the experts had great credentials, they differed significantly on a possible cause of the problem and type of intervention needed.

The differing opinions led to the impression that none of the experts knew what they were talking about. Rumors emerged that some experts knew the cause, but were covering up mistakes made at the expense of the horses and their owners.

What would you do?

How could a situation like this be controlled?

Eventually a state-wide horse association, in cooperation with officials from the state and a university, employed a PIO and tasked this person with providing accurate public information. In repeated press and public announcements, the PIO stated and reinforced the facts that an increased number of foals had died that year.

The cause of death of some foals was, in part, due to common causes of disease at this time of year. Other foals had a variety of clinical signs that appeared to match a particular agent. Great efforts were being made to confirm the cause so that effective interventions could be recommended.

Eventually the public's confidence was regained, a principal diagnosis was eventually confirmed, and recommendations for effective intervention were widely broadcast.

Review

We know from other disasters that the public becomes increasingly concerned when experts disagree with one another. For example, after the Three Mile Island incident, the public panicked when scientists disagreed on the risk of radiation exposure.

When specialists disagree, their conflicting views often lead citizens to conclude that nobody knows the facts or actual risks. The public will then form opinions with no basis in fact and may take independent action.

However, most people do not expect complex issues, such as disasters, to have simple solutions. When the public is given the facts and an understanding of the complexity of a problem, the people frequently reach intelligent conclusions.

When the public is paying attention to issues that may affect them directly, such as disasters, they can be expected to process complex information and interpret it meaningfully.

Therefore, the goal of public announcements is to convey facts in sufficient detail for the public to understand the challenges and the complexity of the issues.

Case 2: Lame deer and cattle

In the fall in Nebraska, deer hunters notice that some of the deer are lame and easy to track because they do not appear to fear humans. One hunter thought he had seen some deer drooling.

One evening in a local bar, several hunters are discussing these findings. A local livestock producer joins the conversation. He has noticed several of his cattle with similar signs in the previous week.

Someone remembers that several local people had visited a country earlier in the year where there had been a Foot and Mouth Disease outbreak.

What are your concerns?

What is the public perception at this point?

The room turns silent. Many people are familiar with the clinical signs and devastation caused by Foot and Mouth Disease in Europe from television reports. A heated debate followed on the diagnosis, risks, and control of Foot and Mouth Disease.

The bar owner had access to the Internet and logged on so his customers could look up information and “chat” about Foot and Mouth Disease.

Many of the Internet inquiries generated various descriptions of what to do and theories for treatment and control. Much of the information gained could not be fully understood that evening, and rumors spread that Foot and Mouth Disease was about to explode across the United States.

What would you do?

How would you obtain accurate information?

One hunter decided that the rumors were out of control and called his friend, a veterinarian, at home. After establishing that the animals could not be caught and investigated that night the veterinarian advised him to follow up early the next day. The hunter passed this information on to the others.

The next day, the farmer with the affected cattle calls his veterinarian and an investigation is started. Both deer and cattle are examined.

Indeed, some of the cattle have lesions in their mouths, and some appear lame. The veterinarian calls the federal Area Veterinarian in Charge (AVIC) for advice and support. Within a few hours, a Foreign Animal Disease Diagnostician (a specially trained federal veterinarian) is dispatched to the farm to conduct a thorough investigation of the scope of possible disease spread and to collect samples for laboratory submission. The farm is quarantined to stop further animal movement.

(Note: The farmer could have also called the state veterinarian for advice and support. The state veterinarian's office would have then contacted the AVIC, who would have appointed a Foreign Animal Disease Diagnostician. Also, farms are not automatically quarantined. In this hypothetical case study we used quarantine measures for illustrative purposes).

What are your concerns?

What message do you think quarantining the farm sent to the community?

The word of a contagious disease outbreak spreads rapidly through the community. Many farmers and hunters are worried that their farms will be quarantined and that their animals may have to be slaughtered. Some farmers consider moving their animals out of the area for fear that their herds could become infected.

What would you do?

How could the public's concern be addressed?

The veterinary officials become concerned that farmers might react in ways that could jeopardize more animals, and decide that a public announcement on the facts of the case should be released. After some discussion, it is decided that the best spokesperson is the local veterinarian. He is well known in the community and has a high level of credibility among livestock producers. He had also been interviewed on television several times before.

The veterinarian is given a scripted message with the following information:

“The field diagnosis of a vesicular disease in deer and cattle has been made. Vesicular diseases mean that one of the clinical signs are blisters (vesicles). Because vesicular diseases, including Foot and Mouth Disease, are difficult to distinguish from one another, stringent safety precautions are being taken

to prevent any potential spread of disease. A preliminary diagnosis may be reached within 24 hours and will be announced publicly as soon as it is known.”

In less than 24 hours, a diagnosis of Foot and Mouth Disease is ruled highly unlikely, and a tentative diagnosis of Epizootic Hemorrhagic Disease of deer is made. Although the farm remained quarantined for another 2 days until the diagnosis of Epizootic Hemorrhagic Disease was confirmed, no further restrictions were placed on the community.

Standard procedure for investigations

There is a standard procedure for investigating all suspect and confirmed cases of List A diseases.

If an owner/manager or private veterinarian suspects a Foreign Animal Disease, he/she should contact the local federal or state veterinary office to initiate an investigation.

Whenever there is any report that a disease may be a Foreign Animal Disease, the federal or state veterinarian in that state will immediately assign the most readily available Foreign Animal Disease Diagnostician to do a complete investigation. Foreign Animal Disease Diagnosticians are specially trained in recognizing clinical signs of Foreign Animal Disease and collecting appropriate samples to send to the National Veterinary Service Laboratory in Ames, Iowa, and/or Foreign Animal Disease Diagnostic Laboratory on Plum Island, New York.

Preliminary and final laboratory results are sent to the AVIC, state veterinarian and Foreign Animal Disease Diagnostician involved in the investigation. The Foreign Animal Disease Diagnostician then informs the owner/manager and referring veterinarian of the laboratory test results.

In the case of a strong suspicion that a Foreign Animal Disease has occurred, immediate actions are initiated at the local, state and national level to mitigate the spread of disease even before a preliminary diagnosis. At the state level, these actions should be coordinated with the state emergency management agency.

All owners and managers of livestock farms and emergency managers should know the telephone numbers of their Area Veterinarian in Charge (AVIC) and state veterinarian.

The addresses and phone numbers of AVIC's and state veterinarians are available at:

(AVIC's) http://www.aphis.usda.gov/vs/area_offices.htm

(state veterinarians)

<http://www.usaha.org/whoswho.html#bulk>

The appointment of a PIO is useful for coordinating authoritative information and assuring the public and the media that the situation is under control. It is best to choose a PIO who has a good rapport with the main audience and who understands the issues. The PIO works with the media and provides them with accurate and consistent information.

Press releases and public announcements should contain information that acknowledges the public's concern, states what is factually known and not known, and describes what is being done about the problem. Absolute statements are best avoided.

By advising the times at which press conferences are given, information can be better controlled. Effective time and information management reduces the potential for rumors to emerge.

Assess Your Vulnerability

Disease Outbreak	
Item	Vulnerability Score
1. Based on what you have learned in this unit, how effective are the biosecurity measures on your farm? 1 (my farm has excellent biosecurity)—5 (I still have to implement biosecurity)	
2. If you were to have a major disease outbreak on your farm, how disruptive would that be to your operation (e.g., how severe would the economic impact be)? 1 (it would have very little impact)—5 (it would be very disruptive)	
3. What is your vulnerability to disease outbreaks? Add 1 and 2	Enter this number on page 16-3
Public Concern	
Item	Vulnerability Score
1. How often do you meet with your herd/large animal veterinarian to discuss animal diseases that you should be concerned about? 1 (at least once a year)—5 (never)	
2. How often have you met with your local emergency management officials to discuss how you would handle a major disease outbreak in your county? 1 (at least once a year)—5 (never)	
3. What is your vulnerability to heightened public concern? Add 1 and 2	Enter this number on page 16-5



Learning Check

Directions: Determine if the following statements are true or false based on the material in this unit. When you have finished, check your answers on page 15-19.

1. Large-scale disease outbreaks have many features in common with natural disasters.
True or False?

2. Losses from animal disease outbreaks include loss of production and replacement of animals.
True or False?

3. Freedom from List A diseases in a country includes being free of clinical disease and vaccinating against the disease.
True or False?

4. List A diseases could be introduced to the U.S. by foreign travelers or terrorists.
True or False?

5. One factor that has increased the vulnerability of the U.S. livestock industry to the spread of disease is the intensification of the industry.
True or False?

6. Biosecurity is the principal mitigation for disease outbreaks.
True or False?



Learning Check

7. Delivery and dispatch points on farms should be located next to livestock.
True or False?

8. Keeping trucks and trailers clean is an effective biosecurity measure to reduce the spread of animal disease.
True or False?

9. Producers, emergency management officials, veterinarians, and allied industries should work together to develop local contingency plans for disease outbreaks.
True or False?

10. Animal disease outbreaks can severely affect consumer confidence in animal-derived foods.
True or False?

11. Rumors in disasters often arise when the public is given conflicting information by specialists.
True or False?



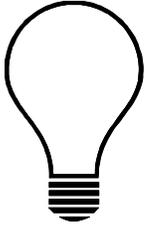
Learning Check

12. Coordinating public information delivery through press conferences is an effective way to convey facts to the public in disasters.
True or False?

13. Given appropriate factual information, the public is prone to believe rumors about risks.
True or False?

14. The only source of information to confirm the diagnosis of regulated animal disease is from veterinary officials.
True or False?

15. A federal Foreign Animal Disease Diagnostician must conduct the investigation of a Suspected Foreign Animal Disease/Emerging Disease Incident.
True or False?



Answers

For every question that you answered incorrectly, review the page listed next to the answer to find out why your answer was incorrect.

1. True.....15-1
2. True.....15-1
3. False.....15-2
4. True.....15-3
5. True.....15-4
6. True.....15-4
7. False.....15-5
8. True.....15-5
9. True.....15-6
10. True.....15-8
11. True.....15-9
12. True.....15-9
13. False.....15-10
14. True.....15-10
15. True.....15-13

Summary

This unit described the impacts and consequences of animal disease outbreaks and how to mitigate these effects. This Unit also discussed how the public is concerned about animals in disasters and ways to convey meaningful information to the public.