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Recommended Citation
Leah Dorman, Foot and Mouth Disease Responses in Ohio, 38 Case W. Res. J. Int'l L. 609 (2007)
Available at: http://scholarlycommons.law.case.edu/jil/vol38/iss3/10
FOOT AND MOUTH DISEASE RESPONSE IN OHIO

Leah Dorman*

Agriculture is Ohio’s number one industry, and the basis of the national economy. Ohio’s agriculture is worth approximately eighty billion dollars. One in every seven jobs is agriculturally related. Ohio is second in table egg production and the largest sheep-producing state east of the Mississippi River. Without agriculture our economy would fail. Without agriculture we would have no food and no fiber (wool, cotton). So, where would we be without agriculture? Naked and hungry!

Agriculture is vulnerable. Agriculture is threatened daily by natural disasters such as drought, flood, wind, hail, plant disease and animal disease. A more recently recognizable threat is agroterrorism—the purposeful act of using chemicals, biologics, radiation, nuclear devices, or explosives aimed at a component of the agriculture industry. Agroterrorism is not aimed at killing plants, animals, or humans, but designed to wreak havoc and undermine the nation’s economy.

One method of agroterrorism is the introduction of foreign animal diseases. Foreign animal diseases are diseases that are not currently present in the United States. Because our livestock population is naïve to these diseases, they have no immunity and if exposed to the disease will most likely show clinical signs. Preventive measures are in place to ensure these diseases do not enter the United States, thereby protecting our livestock industry and food supply.

Foreign animal diseases, along with many other diseases, are reportable in the United States. Under Ohio Law, for example, “[i]f any person has reason to suspect the existence of a dangerously contagious or infectious disease or a residue, he immediately shall give notice of that fact to the director of agriculture or to a licensed veterinarian.”1 A licensed veterinarian is then required to report the suspicion of a foreign animal disease to the Ohio Department of Agriculture.

Foot and Mouth Disease (FMD) is a disease, along with many others, that could be used as an agroterrorism agent; in the scenario-based symposium “The Fifth Plague,” held in March of 2006 at the Case Western Reserve University School of Law, participants used FMD as a hypothetical

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1 O.R.C. 941.06 (emphasis added). The Ohio dangerously contagious or infectious and reportable disease list can be found in Chapter 901, section 1-21-02 (A) of the Ohio Administrative Code.
agroterrorism agent. FMD is on the reportable disease list in Ohio and on the Office of International Epizooties (World Animal Health Organization) reportable disease list. Foot and Mouth Disease is a severe, highly contagious disease that mainly affects cloven-hoofed animals, such as cattle, sheep and pigs. FMD is caused by a virus called a picornavirus, which has seven distinct serotypes and many other subtypes that are not cross-protective. This means that all FMD strains are not created equal. If an animal is infected with one type of FMD, it would not necessarily be protected if exposed to a different strain of the same virus. The FMD virus is inactive at low or high pH and something as mild as acetic acid (vinegar) will kill the virus. Because FMD is one of the most highly infective and contagious viruses known, the problem lies in getting all the virus deactivated.

Thorough cleaning and disinfection is important to decrease the spread of FMD. FMD virus is produced in almost every bodily fluid of an infected animal. Transmission occurs through the respiratory tract and through direct contact with body fluids or tissues of infected animals. The virus can live in carcasses, meat, water, bedding materials, and in the environment in general. Exposure of susceptible livestock to contaminated vehicles, boots, clothing, or equipment can also bring the FMD virus into a herd or flock. Although FMD is not a significant human health hazard, the virus can be harbored in the human respiratory tract for up to forty-eight hours and could potentially spread the disease to animals.

Blisters on the mouth, tongue, nose, teats, and feet are the most common signs of FMD, just as the name implies. The oral lesions cause severe drooling and a drop in appetite. Blisters above and between the hooves result in lameness. The discomfort can be so relentless that the animals may become unable or unwilling to walk. They will shift their weight off the affected limbs and may go down in a praying or sitting position. An erosion, which is seen more commonly than the blisters themselves, is the result of a blister rupturing. Body temperature usually rises markedly in the first forty-eight hours and then falls. Abortions may occur. Milk production falls dramatically.

Cattle are the indicator animals, because they tend to display signs of the disease before other species. Pigs are the amplifier animals, or virus factories—one pig can produce and shed millions of infective doses of FMD. Sheep and goats are the great masqueraders, as they tend to mask the disease. The symptoms tend to be mild, but they can be spreading the disease at a rapid rate.

Because of the highly contagious nature of FMD, the prevalence of the disease in an exposed group of susceptible animals will be one hundred percent (or very close to it). The mortality, on the other hand, can be quite low. Many animals can and will recover from FMD infection, but secondary infections with bacteria or other viruses are common. Due to the virus and its sequela, the infected livestock often times end up as poor doers, stunted
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in their growth with a lower level of production. The mortality rate is higher in younger animals and with certain virulent strains.

The incubation period is the time it takes for an exposed animal to show clinical signs and symptoms of the disease. The incubation period for FMD can be as short as forty-eight hours, which only adds to its ability to spread rapidly.

Like the common cold, which is also a virus, no treatment is available for FMD. It just has to run its course. Vaccination is available, but because of the international trade ramifications, it may or may not be a viable option.

FMD is prevalent throughout the world. It has been identified in Africa, South America, Asia, and Europe. Some countries choose to live with the disease, while others choose to eradicate it. The United States has not seen an outbreak of FMD since 1929, while Canada and Mexico last saw the disease in 1953.

The old, familiar saying, "an ounce of prevention is worth a pound of cure," really does hold true. Accidental introduction to the United States is possible, but precautions are taken to minimize our risk. The U.S. forbids imports of live, cloven-hoofed animals from countries who have not eradicated FMD. The virus can live in meat products, and therefore these are also forbidden for import. The beagle brigades are used to sniff out any meat or food products smuggled across our borders. Education is a large part of prevention. Ensuring that livestock producers and veterinarians recognize the symptoms of FMD will facilitate rapid diagnosis. Biosecurity is very important for any disease, but is extremely important with FMD exposure. When a person has been working with FMD, a voluntary quarantine is imposed, avoiding contact with susceptible species for at least five days.

I will use an FMD scenario to illustrate what may happen during a potential FMD outbreak. This scenario was the basis for "The Fifth Plague" simulation exercise.

Mr. Joe Farmer is a dairy producer, who milks 120 cows. One morning, he notices his cows are eating poorly and drooling. He also finds a couple four to six month old heifer (female) calves dead in the pasture. Some adult cows are beginning to exhibit signs of lameness. Milk production has dropped dramatically. Mr. Farmer is having trouble getting them into the parlor to be milked due to their foot problems. Mr. Farmer immediately calls his veterinarian to request a farm visit.

Later that day, Dr. Jane Veterinarian, Mr. Farmer’s veterinarian, examines the cattle and finds that 75% of the cattle have a fever, and 25% of the cattle are having trouble walking. Fifty percent are drooling and either have ruptured blisters or intact blisters in their mouths or nostrils. Dr. Veterinarian calls the Ohio Department of Agriculture and reports her findings to the State Veterinarian. Dr. Veterinarian advises Mr. Farmer not to move any livestock.
The State Veterinarian contacts the Area Veterinarian In Charge with USDA-APHIS-VS to discuss the situation. A Foreign Animal Disease Diagnostician (FADD), a veterinarian who has been specially trained to recognize and diagnose foreign animal diseases, is assigned to the case and is dispatched to the Farmer Family Dairy Farm.

The FADD arrives at the Farmer Family Dairy Farm that evening to talk with Mr. Farmer and Dr. Veterinarian. The FADD's visit reveals that nearly 100% of the cattle have a fever. Many of them are drooling, reluctant to walk and are not eating. Ruptured blisters are noted on the cows' nostrils, tongues, mouths and between their toes. Samples are collected from cattle in various stages of disease. The presumptive diagnosis is Foot and Mouth Disease.

A movement history is taken. Mr. Farmer has not purchased any animals recently, but he sold three cull cows to CowBuyers USA two days before he began having problems, and he sold two bull calves to a local producer. Mr. Farmer has not attended any exhibitions or shows in the last 30 days. The Farmer family has not traveled to any foreign countries nor had any visitors who have traveled in the last 30 days. Feed is delivered weekly by a bulk grain hauler and Mr. Farmer just switched feed companies one week ago. No recent hay or straw purchases have been made. Recent repair of the pasture fences has been done by two high school boys, the Smith brothers, who live down the road. The Smiths raise beef cattle and recently loaned Mr. Farmer their cattle chute, which was just returned to the Smith Farm two days ago.

While at the farm, a conference call takes place between the FADD, the AVIC and the State Veterinarian. Since a foreign animal disease looks highly likely, a priority one was placed on the laboratory samples. Regional USDA-APHIS-VS is alerted. The Ohio Emergency Management Agency director, under advice from the State Veterinarian, set the Crisis Action System (CAS) level at CAS II. The Foreign Animal Disease Diagnostic Lab (Plum Island, NY) was contacted and samples are flown to Plum Island escorted by Ohio State Highway Patrol personnel. The farm is issued a written order of quarantine of all livestock and equipment. Strict biosecurity must be maintained and procedures are discussed with the Farmer family and Dr. Veterinarian.

Once a case of FMD is diagnosed in Ohio, the Animal Disease Incident Plan will be fully activated. The Animal Disease Incident Plan is part of the Ohio Emergency Operations Plan and follows federal guidelines. The plan is organized by functions including public information, surveillance, appraisal and compensation, euthanasia, cleaning and disinfection, orientation and training, quarantine and movement control, law enforcement and recovery. The purpose of the plan is to coordinate state, federal and local efforts to prevent, stop and eliminate the spread of animal disease, minimizing the human and economic impact of that disease.

The Public Affairs Support Annex in the Ohio Emergency Operations Plan ensures the State of Ohio transmits consistent messages to vari-
ous audiences and focuses a strong effort to educate and inform these audiences with messages that help them comprehend the State of Ohio’s measures taken to respond to and control the problem and protect the health and welfare of the people of Ohio.

Surveillance activities include investigations of suspected cases of FMD, tracing animals to and from an infected farm and monitoring premises. In our scenario, surveillance teams will follow up with CowBuyers USA and the local producer, who both received animals from the infected premises. Teams will also visit the Smith farm where a piece of equipment was recently returned that may have contained FMD virus. Other visitors or employees such as the feed company may also be contacted. Any farm containing susceptible species within a six mile radius will be surveyed for disease.

A stamping-out method of disease control is the internationally accepted response to FMD and must be done in order to retain agricultural exports. This requires the destruction of large numbers of animals, and appropriate disposal of their carcasses. Prior to such actions, the livestock and equipment will be appraised, so the owner can receive a fair market value indemnity payment for everything destroyed. Aesthetically acceptable, humane euthanasia will be performed as quickly and efficiently as possible, using acceptable agents and methods. Care must be taken to minimize, to the extent possible, the emotional and psychological impact on animal owners, caretakers, and their families. FMD contaminated materials, including animal carcasses, will be properly disposed of by burial, incineration, composting or rendering. Disposal will be done in a manner that does not allow the disease agent to spread, has little or no effect on the environment, and conserves meat or animal protein if logistically supportable from a biosecurity standpoint.

Cleaning and disinfection will be completed on any premises on which FMD is presumed or confirmed to exist. If items cannot be adequately cleaned and disinfected, they should be disposed of by appropriate methods. All activities must adhere to proper biosecurity, which includes proper cleaning and disinfection. Training on biosecurity procedures will occur for all personnel onsite.

Quarantine and movement control is imperative to prevent the spread of FMD. In our scenario, the Farmer Dairy Farm will be quarantined. Depending on the surveillance teams findings, CowBuyers USA and the local producer who received the bull calves most likely will also be quarantined. Because FMD is highly contagious, a quarantine will be placed for a minimum of six miles around the Farmer Dairy Farm. Large numbers of law enforcement personnel may be required to provide security around the perimeters of restricted areas and enforce legal requirements.

Economic recovery from an FMD outbreak would be long-term. Reimbursement procedures would be ongoing. Behavioral health concerns
for animal owners, response and recovery personnel will need to continue to be addressed as will security, biosecurity, and environmental issues for disposal sites. Legal issues will need to be tracked and monitored.

An animal disease outbreak is different compared to other emergencies, in that the state and federal agencies are involved from the very beginning through the end of the incident. Veterinary Services (USDA-APHIS-VS) and the Ohio Department of Agriculture work together on a daily basis and would work as a team with the local emergency responders in the event of a foreign animal disease incident.

Many of us take agriculture—and the safety and abundance of our food supply—for granted. There are many places where the food supply is vulnerable in the industry process from the farm to the fork. We must continue striving to prevent a foreign animal disease from gaining entry to the United States and utilizing proper control strategies to minimize the economic ramifications if such a disease gets a foothold. Foreign Animal Disease response plans may seem severe, but a swift, stamping-out response is crucial and will be used to protect our resources. I don’t know about you, but I certainly do not want to be left without agriculture—naked and hungry!