# Bio Terror Bible

## EXPOSING THE COMING BIO-TERROR PANDEMIC

**BIOTERRORBIBLE.COM:** In the aftermath of man-made bio-terror generated pandemic, the government and media will be feeding the public any number of different scapegoats allegedly responsible for the pandemic that will likely kill millions.

While some scapegoats (see below) are indeed plausible, it is much more likely that the live pathogens or agents responsible for the pandemic will likely be dispersed via A) chemtrails by government airplanes or drones, B) by the U.S. Postal Service via Tide detergent samples, C) by the government and medical establishment via tainted vaccines or by D) the portable petri dish commonly known as the Trojan condom.

**Bio-Terror Scapegoats:** Africa, Agriculture (Food & Animals), Airports & Air Travel, Al Qaeda, Bio Labs, Bio-Terrorism Is Easy, Bio-Terrorists (Bio-Hackers), Black Market, Bugs & Insects, Censorship / Lack Thereof, Domestic Terrorists, Exotic Animals (Zoonosis), Government Ineptitude, Mail-Order DNA, Mexico, Missile Shield Failure, Mutation, Natural Disaster, No Clinical Trials (Vaccines), and The Monkeys.

**Title:** Law Enforcement's Role In Defending Against Bio-Terrorism Threats To America's Livestock Industry
**Date:** 2002
**Source:** Homeland Security

**Abstract:**

**What Is the Threat?**
There is general agreement among agriculture experts that the greatest biological threat to our country's agriculture economy is *foot-and-mouth disease* (FMD). This highly contagious, viral disease attacks cloven-hoofed animals (cattle, swine, and sheep), as well as wildlife such as deer and elk. The FMD virus has a remarkable capacity for remaining viable in carcasses, in animal byproducts, in water, in straw and bedding, and in pastures. Early indications of FMD are excessive salivation and lameness. Infected animals usually refuse to eat or drink, and their movement is severely restricted, resulting in a dramatic weight loss. Milk production in dairy cattle will also decrease or stop.

An outbreak of FMD, either by intentional introduction of a virus or by accident, would bring our nation's economy to a virtual standstill.

Dr. Jerry Jaax, a research veterinarian at Kansas State University and an expert in the field of biological warfare, has presented compelling testimony to Congress concerning the potential disaster that FMD poses to our livestock industry. "In terms of an economic impact, it would be devastating. Any outbreak of FMD could mean the destruction of thousands of animals, immediately impact our capacity to export agriculture products, and create severe financial losses in only a matter of days and weeks," Jaax stated. He cited the 2001 FMD outbreak in the United Kingdom as an example of the possible fallout for any agriculture economy. "The outbreak in the UK took almost nine months to eradicate, and their economy will suffer for years to come."

**Where's the Beef** (Source: U.S. Department of Agriculture Cattle Report, 19 July 2002)

**1.** Texas: 15.0 Million head of cattle
**2.** Nebraska: 7.0 Million head of cattle
**3.** Kansas: 6.6 Million head of cattle
**4.** Oklahoma: 5.6 Million head of cattle
**5.** California: 5.2 Million head of cattle
**6.** South Dakota: 5.0 Million head of cattle
**7.** Missouri: 4.7 Million head of cattle
**8.** Iowa: 4.0 Million head of cattle
**9.** Wisconsin: 3.6 Million head of cattle
**10.** Colorado: 3.1 Million head of cattle
**11.** United States Total: 105.2 million head of cattle

George Teagarden, Kansas Livestock Commissioner, outlined the emergency response procedures that are in place to deal with an outbreak of FMD in the state of Kansas. He explained that all movement of livestock would *immediately* be halted and that a six-mile quarantine zone would be established surrounding the point where FMD was detected. At the center of the quarantine zone, a "kill zone" would be established where all cloven-hoofed animals would be destroyed. Teagarden emphasized the extent of a quarantine around the area—no animal movement from the affected area, and no movement of equipment or vehicles from the affected area. Only persons who have been fully decontaminated would be allowed to leave this area. Teagarden further explained that a full quarantine is necessary because the FMD virus can be carried or transmitted in several ways—on a person's clothes, shoes, or boots and on tires of equipment, trucks, and other vehicles. "It is critical that all movement of livestock be halted in order to prevent further spreading of this highly infectious virus," he stated. Teagarden explained that the movement of livestock from other states into Kansas would also be stopped, requiring coordination between law enforcement agencies in the surrounding states.

Jaax and Teagarden both cited the sweeping impact of the FMD outbreak in the United Kingdom. In England, FMD was originally detected at a hog farm in February 2001, and it quickly spread. Throughout the UK, virtually all exports of products related to sheep, swine, and cattle were stopped following the outbreak, and they will not resume for some time.

**What Is Foot-and-Mouth Disease?**
FMD is a serious animal health problem in several countries of the world. This viral disease is caused by livestock inhaling or otherwise coming in contact with the virus. It is usually contracted via the respiratory system and is rapidly contagious from animal to animal. It causes severe blisters, called *vesicles*, in the mouths and hooves of the infected animals, and FMD severely cripples animals, thus limiting their mobility and curtailing their capacity and desire to consume food. Although extremely painful to animals, FMD is *not* infectious to humans.

Teagarden has been conducting a series of educational meetings throughout the state in an effort to alert livestock producers and feedlot operators about the serious threat of FMD. Dr. Kevin Varner, USDA veterinarian, and Dr. George Kennedy, Kansas State veterinarian, join Teagarden in presenting helpful information. Kennedy was one of the U.S. veterinarians sent to England to help contain the FMD outbreak there.

**These presentations focus on:**

**1.** The need for each livestock producer and feedlot operator to develop a bio-security plan as a preventive measure against FMD
**2.** The importance of early detection and understanding warning signs of FMD in cattle, hogs, and sheep

**3.** Understanding the emergency plans to be implemented by the U.S. Department of Agriculture (USDA), the Kansas Animal Health Department, and Kansas law enforcement in the event of an outbreak of FMD

**As a means to prevent his type of threat to our economic infrastructure, these countermeasures are recommended:**

**1. Intelligence.** Develop an information-sharing system concerning suspects and suspicious activity.
**2. Surveillance**. As the first line of defense, local livestock producers and veterinarians need to develop a bio-security plan. Everyone must be aware of the risks and symptoms associated with infectious diseases.
**3. Rapid diagnostic capabilities.** On-site diagnosis must be conducted, with confirmatory tests conducted at the USDA Laboratory in Plum Island, New York.
**4. Rapid incident response.** Local, state, and federal agencies will quickly respond, in accordance with K.S.A. 47-611, to contain and eradicate any outbreak of a foreign animal disease. The Kansas Livestock Commissioner will coordinate this response.
**5. Training.** All members of the livestock industry must be provided with a continuing form of training and timely updates concerning possible biological threats.

**What Is Law Enforcement's Role in Helping Prevent Harm to America's Agriculture?**
If an outbreak of FMD were deemed an act of terrorism, the FBI would assume overall responsibility for the law enforcement response and for conducting the criminal investigation. Presidential Decision Directive 39, signed on 21 June 1995, designates the FBI as the lead federal agency for managing the operational response to an attack from a terrorist or use of a weapon of mass destruction against the United States.

**As part of a *coordinated* response to a biological attack on agriculture, law enforcement officers would play any number of roles, including:**

**1.** Providing security and implementing a quarantine for the infected area
**2.** Assisting in the conduct of a criminal investigation
**3.** Providing assistance requested by federal agencies, such as the USDA
**4.** Providing assistance requested by state regulatory agencies
**5.** Conflict resolution

**What Is the Legislative Authority?**
During the 2001 legislative session in Kansas, House Bill No. 2468 was passed and signed into law, establishing clear and specific responsibilities for agencies responding to a declared state of emergency caused by animal diseases. This bill, amending K.S.A. 47-611, defined criminal conduct relative to animal health issues and made it a *criminal act* (level 4, nonperson felony) to expose any animal in this state to FMD. It states further that "the governor will utilize *all available resources* of the state government to cope with the disaster." The Kansas Livestock Commissioner would be empowered by the governor to directly manage emergency operations during an outbreak of FMD or other form of foreign animal disease in the state.

A more critical role for Kansas law enforcement would occur *before* an act of bio-terrorism, by gathering intelligence that would hopefully prevent an outbreak of some *intentionally introduced* foreign animal disease. Kansas' livestock industry is made up of five primary groups:

**1.** Livestock producers
**2.** Feedlot operators
**3.** Livestock marketers
**4.** Veterinarians
**5.** County extension agents

Agriculture-based states are vulnerable to a foreign animal disease in a number of diverse locations. Within the state of Kansas there are 462 feedlots, 104 meat-processing plants, 94 domestic elk or deer facilities, and 55 livestock markets.

Preventing an attack or outbreak of a foreign animal disease should be the primary focus of the agriculture industry working in concert with local law enforcement.

In recent town meetings throughout the state, USDA officials and the Kansas Livestock Commissioner have asked members of the livestock industry to report any suspicious activities in the proximity of a livestock operation to law enforcement authorities. This type of information and pro-active intelligence would be essential to help prevent an outbreak of an *intentionally introduced* foreign animal disease, rather than having to respond to a disaster *after* the fact.

Within federal regulations (28 CFR part 23), the KBI is expanding its existing intelligence database, called KsLEIN (the Kansas Law Enforcement Intelligence Network) to help identify any potential threat to Kansas agriculture. The purpose of this database will be to track suspicious activity and individuals reported to Kansas law enforcement and to the KBI. This computerized network will also serve as the repository for complaints and information from citizens concerning suspicious activity. KsLEIN is being modified to add an intelligence component related to bio-terrorism threats to Kansas agriculture. Currently, there are 345 law enforcement agencies participating in KsLEIN.

Biological threats to agriculture represent a new challenge for Kansas law enforcement, and it is important that we understand possible threats, vulnerabilities, available resources, and likely scenarios. To help with this understanding, several training sessions have been initiated. The Ford County Sheriff's Office hosted a regional seminar in Dodge City involving law enforcement officers, livestock producers, and feedlot operators in the west region. Officers were able to learn firsthand about the potential threats and the impact of a bio-terrorism attack on livestock. In turn, there was a mutual understanding by livestock producers of the capabilities and resource limitations of law enforcement agencies in the west region.

In October 2002, a joint training exercise was held in Dodge City involving representatives from local, county, state, and federal law enforcement agencies, as well as emergency management personnel, the Kansas National Guard, USDA, representatives from the livestock industry, and the Kansas Animal Health Department. The training scenario focused on an intentionally introduced outbreak of FMD in western Kansas.

"This exercise was a good opportunity to test our emergency response plan, to define agency responsibilities, to identify limitations, and to make changes for the future," Ford County Undersheriff James Lane said. One of the major problems identified in this training exercise was how to effectively deal with the movement of livestock not affected by the outbreak. For example, approximately 500 truckloads of cattle move through western Kansas *every day*. "Stopping the movement of livestock requires contingency plans to handle unloading, feeding, and caring for these cattle," Lane said. "This is an enormous logistical task, requiring advance planning, cooperation, and coordination."

Preventing and responding to threats to agriculture, particularly FMD, represent a major law enforcement challenge. "The key for law enforcement is understanding the complexity of the agriculture industry, and developing new partnerships to help prevent any bio-terrorism attack. Responding after the fact will be costly and difficult," Undersheriff Lane stated (Homeland Security, 2002)

**Title:** Bioterrorism Experts Head To Atlanta
**Date:** March 25, 2002
**Source:** UCLA

**Abstract:** Hundreds of health officials descended on Atlanta this week for an annual conference on emerging infectious diseases and were warned that terrorists might try to spread deadly germs through the food supply.

Terrorists could try to make the biological attack even more dangerous by taking down critical communications systems, according to experts from the Centers for Disease Control and Prevention.

"The national system was overwhelmed" by the anthrax scare last fall, said Dr. James Hughes, chief of infectious diseases at the Atlanta-based CDC. "Clearly we learned that we were not adequately prepared. This was a small attack."

The conference agenda, usually filled with sessions on obscure diseases and small outbreaks, is dominated this year by information on anthrax and smallpox -- considered among the most dangerous terrorist agents.

The anthrax-by-mail attacks killed five people last fall and sickened 13 others. The CDC said earlier this month that a Texas laboratory worker handling anthrax specimens became infected with the bacteria and is recovering.

Hughes said health experts must consider the possibility of genetically altered germs, the release of more than one agent at a time, or transmission through animals and the food supply.

To guard against deadlier attacks, the CDC is distributing $918 million to state and local health departments later this year and next year. The CDC is encouraging them to give priority to upgrading labs and training health workers on how to recognize diseases like anthrax and smallpox.

During and after the anthrax mailings, the CDC was criticized for not communicating clearly to the public about what was myth and what was a real danger. Hughes said some of the millions of dollars to be doled out to prepare for bioterrorism must address communication.

"Clearly, that was something that did not work well during the anthrax attacks," he said. "Our lives have changed. We will be prepared."

The conference also included a refresher course on smallpox, a highly contagious and deadly disease not seen in humans in a generation.

The CDC and a Moscow laboratory hold stocks of the virus, and experts worry that samples could fall into the wrong hands and be converted into a terrorist weapon.

Dr. Stanley Foster of Emory University, who was part of the team that eradicated smallpox, said the United States could react swiftly to a smallpox release, but other countries are extremely vulnerable, with no vaccine or weak public health systems.

Three Johns Hopkins University researchers suggested shutting down all air travel in and out of cities after even one case of smallpox is reported to avoid rapid spread of the disease.

"We could easily have 100 million cases and 20 million deaths," Foster said. "Are we going to be able to prevent it?" (UCLA, 2002).

**Title:** Farms Vulnerable To Terrorism, Study Says
**Date:** September 14, 2002
**Source:** UCLA

**Abstract:** Little is being done to address the real threat of a terrorist attack focused on the United States agriculture industry, said members of a government-sponsored commission that met Friday to examine the state of America's preparedness for terrorist action.

"I think the panel has to come out strongly that there needs to be more attention paid to these (agricultural threat) issues, and that these recommendations are just a little bit of what is needed to be done," said Ellen M. Gordon, administrator of the emergency management division of the Iowa Department of Public Defense.

She spoke at the quarterly meeting of an advisory panel that assesses U.S. domestic response capabilities to terrorism that involves weapons of mass destruction.

"Literally, this is an issue on which nothing is being done," said Gordon, who is also president of the National Emergency Management Association.

The commission, also known as the "Gilmore Commission," has been run by the RAND Corp. for 4 years under government contract, through the think tank's federally funded National Defense Research Institute.

The commission's recommendations have taken on new importance in light of the Sept. 11 attacks and the deadly anthrax mailings that followed them last fall.

As a think tank that supplies research and support for the initiative, and briefings on key issues, RAND wields much influence over the commission's recommendations. At Friday's meeting, RAND personnel briefed the commission on response capabilities for a bioterror attack with smallpox, and on an ongoing survey on the responsiveness to terrorism threats of emergency service personnel at the state and local levels.

In addition, a panel subcommittee headed by Dr. M. Patricia Quinlisk, medical director and state epidemiologist for the Iowa Department of Public Health, made several recommendations for dealing with the threat of agricultural terrorism, an area of particular interest to commission members.

The panel debated possible recommendations for protecting agricultural industries and products from terrorist strikes, including livestock, crops and fruit awaiting harvest, and processed food heading to grocery stores.

Dr. Quinlisk said a major problem is that while agricultural products are at risk for attack, nothing is being done to study the threat.

"The perception is that agriculture is at some risk, but there is no good idea as to what kind of threat there may be," she said.

One recommendation given to the commission was for an increase in funding for programs to study the threat, evaluate the risks and establish proper responses. Another was that more resources be committed to education and training for veterinarians about animal-borne diseases that are not common in the United States and that could be used to create an infectious agent or to contaminate food supplies.

The commission will also consider creating a system to track outbreaks of animal diseases that is based upon the health threat model used to track outbreaks of human infectious diseases.

Members of the panel noted that there are several federal agencies that have oversight of this area, especially of processed foods. The Food and Drug Administration, Customs Service and Department of Agriculture have jurisdiction over various aspects of the food chain. None, however, have shown the willingness or ability to take up this issue, they said.

Mike Wermuth, RAND's project director for the Gilmore Commission, indicated that the Central Intelligence Agency, for example, has made it clear that it has no interest in addressing the threat of agricultural terrorism.

"As far as we can tell there isn't any interest from the intelligence community," said Wermuth.

Several of the committee members agreed that the effort to protect agriculture, as well as who should be responsible for that, should be better defined in federal statutes.

In addition to agricultural terrorism, said commission chairman Jim Gilmore, the current panel of the commission is also focused on the impact of new anti-terror policies on civil liberties.

"We are focusing intently on civil liberty issues to make sure these recommendations will have the appropriate impact on the American people," Gilmore told United Press International.

This was evident during Friday's deliberations over a controversial recommendation for creating a counter-terrorism information service that would be separate from the Department of Homeland Defense, which is still being formed.

The proposed counter-terrorism information service would be designed to gather intelligence related to possible attacks from within the United States, and would be given a mandate to collect raw intelligence data from law enforcement and other sources. The agency would not, however, have the power to enforce laws.

During the debate over the proposal, Gilmore said he opposes the idea because it needed to "mature" before it can be considered. He added that that a key dilemma with the proposal is the problem of how to handle intelligence on U.S. citizens vs. that on non-citizens.

The proposal for this new agency, and the recommendations on agricultural terrorism, will be further scrutinized and revised before they are voted on later this year and become official commission recommendations.

The Gilmore Commission's fourth annual report is scheduled to be delivered to Congress and the White House on Dec. 15. It will make recommendations on various issues including the National Strategy for Homeland Security; the relationship of the new Department of Homeland Security to other U.S. government, state and local agencies and to the private sector; and the military's role in homeland security (UCLA, 2002).

**Title:** Bioterror Targets May Be On Farms
**Date:** September 20, 2002
**Source:** UCLA

**Abstract:** The United States is highly vulnerable to terrorist attacks on its livestock and food crops and needs a national plan to identify threats, direct research, gather intelligence and respond to outbreaks, a committee of experts said yesterday.

A report by the National Academy of Sciences said that while agricultural bioterrorism was "highly unlikely to result in famine or malnutrition," it could have "major direct and indirect costs to the agricultural economy."

The report also cautioned that there could be "adverse health effects" caused by agents -- such as anthrax -- that can move from animals to humans, as well as "loss of public confidence in the food system ... and widespread public concern and confusion."

The report, titled "Countering Agricultural Bioterrorism," was prepared over the past three years by the academy's National Research Council at the behest of the U.S. Department of Agriculture. Parts of the original report dealing with specific case studies were put in a classified annex withheld from the published study.

"We thought about it all along -- whether we were giving anybody a recipe for how to mount an attack," said David R. Franz, a bioterrorism expert and NAS panelist who is vice president of the Southern Research Institute. "You always have to weigh your vulnerability against the need to educate people about what they're up against and to overcome their natural reticence."

Reticence, however, is no longer a problem, said Iowa State University veterinarian Harley W. Moon, chairman of the 12-member NAS panel.

"September 11 fixed that," Moon said. "People became so urgent that they went ahead on their own." But while "there's increased general awareness and agency interaction," he added, "we need a national response, as well."

In one sign of increased intensity over agricultural bioterrorism, the Agricultural Department's Animal and Plant Health Inspection Service early this week was able to enlist the help of veterinarians, hog farmers, state officials and veterinary labs across the country to watch for evidence of swine disease from genetically altered bacteria cultures stolen from a Michigan State University lab a week ago.

The genetically altered bacterium, *Actinobacillus pleuropneumoniae,* can cause pneumonia, encephalitis and death in pigs but is not dangerous to humans and is hard to spread. "If you were going to pick a pathogen, this would not be high on the list," said Ron DeHaven, deputy administrator at APHIS.

Nevertheless, because of "the potential of it to be a bioterrorist event," DeHaven held a conference call to enlist help from stakeholders at all levels of the pig farming industry.

"If this had happened 13 or 14 months ago, we probably wouldn't have thought twice about it, but we have to assume the worst and be prepared," he said.

According to the NAS panel, preparation requires a national coordinating center. Panelist R. James Cook, a Washington State University plant pathologist, said the participants wanted to make the Centers for Disease Control and Prevention their model. The CDC is a research center and early warning system for outbreaks of human disease.

"We don't know what will happen or whether there will even be bricks and mortar," Cook said. "We just need to be able to do what the CDC does -- get the information we need in real time."

The panel noted that the Agriculture Department already has a well-developed infrastructure to deal with plant pathogens and animal diseases that come into the country accidentally. These have included San Francisco's Mediterranean fruit flies, in the early 1980s, to Florida's citrus canker in the 1990s and today's mosquito-borne West Nile virus.

But the panel cautioned that deliberate infestation demanded a far more extensive menu of precautions, including stringent border monitoring, better overseas intelligence and research to develop resistant plant strains and assemble genetic libraries of likely "threat agents."

Agriculture Secretary Ann M. Veneman noted in a statement that the department has several initiatives similar to those outlined in the report, including identifying a priority list of threat agents, allocating increased funds for bioterrorism research and strengthening its laboratories.

"Because of these aggressive efforts, our nation's food and agriculture infrastructure is stronger today than a year ago," she said. "However, threats remain, and we must work in a responsible and aggressive manner to continue strengthening these programs."

The NAS panel's Moon praised USDA for increasing funding to establish a network of diagnostic labs -- five for livestock and five for plants -- that could be called on to make quick assessments of dangerous pathogens even as they are discovered (UCLA, 2002).

**Title:** US Farms Called Vulnerable To terrorism
**Date:** November 22, 2002
**Source:** UCLA

**Abstract:** They scarcely seem like the classic tools of terrorists: mooing cows, oinking pigs, and clucking chickens. But specialists in public health and agriculture warn that the nation's livestock and crops remain particularly vulnerable to terrorists, threatening the US agricultural system with viral and bacterial infections that could cripple the economy.

Computer models show that an infection such as foot and mouth disease, which decimated Britain's beef industry in 2001, could sweep through 44 states within two weeks of its introduction at a handful of farms in a single state, resulting in 48 million livestock being put to premature deaths.

Although many of the infections, including foot and mouth, pose no direct threat to human health, the economic consequences would be ruinous, specialists said at the Harvard-sponsored *BioSecurity 2002* conference, and would seed considerable doubt about the safety of the nation's food supply.

Foot and mouth virus ravaged agriculture as well as tourism in England, forcing quarantine measures against 10,000 farms and the destruction of 6 million cows, sheep, and pigs.

"It is a perfect weapon for doing the kinds of things terrorists do," said Dr. Thomas J. McGinn III, assistant state veterinarian in North Carolina. "As a target, you can imagine why they would hit something like this and as a weapon, they could spread it wherever they want."

Federal authorities consider the threat so significant that defense against agricultural bioterrorism has a special place in the newly created Department of Homeland Security. Also, last summer, in an exercise conducted at the behest of Defense Secretary Donald Rumsfeld, 40 veterinarians, emergency planners, and military authorities convened for a boardroom drill to assess the potential impact of bioterrorism targeted at farms and food processing sites.

The exercise, dubbed Silent Prairie, assumed that the destruction could begin with something as common as a cotton swab dabbed with viral particles.

The dean of the Harvard School of Public Health is so troubled by those threats that he called for the creation of an agency akin to the US Centers for Disease Control to monitor the welfare of the nation's crops and plants. Barry R. Bloom, the Harvard dean who served on a panel evaluating the threat of bioterrorism, told hundreds of public health, military, and private security authorities at the conference that

the United States is woefully lacking in its ability to swiftly identify contaminants being introduced into livestock and plants.

"There's relatively little surveillance," Bloom said. "It's an enormous task, and we're not prepared."

That remains the case even though the potential for terrorists to cause illness and fear by infecting the food supply became dramatically evident 18 years ago, when members of a fringe religious cult spiked salad bars at 10 Oregon restaurants with salmonella. The result: 750 people became ill.

The damage that could be wrought by a more widespread attack, initiated at multiple sites, is profound, Bloom and other specialists said. Agriculture generates $1 trillion in economic impact annually, accounting for 13 percent of the gross domestic product.

Farming is an exceptionally porous industry from a security standpoint, with 24,000 livestock ferried out of just one state, North Carolina, every day, destined for markets across the world. If terrorists chose a virus such as foot and mouth disease, it would spread with stunning efficiency. Studies have shown that the virus can be carried by the wind up to 40 miles; once introduced to a herd, it is 100 percent infectious.

"If someone's determined enough to get something in, they will get it in," said Dr. Cindy S. Lovern, assistant director of emergency preparedness and response for the American Veterinary Medical Association. "Foot and mouth disease can be brought in on a Q-Tip or the bottom of your boot. That's why it's so critical to find it fast and to treat it quickly."

Foot and mouth is often not fatal to animals, but in the short term produces hideous blistering, and in the long term, impairs their use as productive livestock. The disease rarely produces severe illness in humans, although people can transmit it to animals. Specialists at the *BioSecurity* conference conjured scenarios in which other viruses and bacteria (including plague, anthrax, and tularemia) could be introduced into animal populations, with the ultimate goal of spreading illness to humans. That probably would prove not to be a particularly efficient mode of transmission but would spawn considerable fear. Early detection of a biological attack is paramount, specialists said.

But the arrival of West Nile virus, blamed for sickening 3,700 people this year and killing more than 200, demonstrates how unprepared the nation is for animal disease outbreaks. Until Dr. Tracey McNamara began testing dead crows near the Bronx Zoo, the emergence of West Nile had gone undetected. "We still haven't done what needs to be done," McNamara said. "Everybody pays lip service that animals can serve as sentinels of disease outbreak and bioterrorism, but it seems to be a hard concept to fund" (UCLA, 2002).

**Title:** WHO Issues Alert On Food Terrorism
**Date:** January 31, 2003
**Source:** BBC

**Abstract:** The World Health Organization (WHO) has warned that terrorist groups could try to contaminate food supplies and has urged countries to strengthen their surveillance.

In a special report, the leading UN health agency, said an attack using chemical or biological agents in food could lead to people dying or contracting serious illnesses like cancer.

The agency said it had not received any specific warnings of such an attack.

But it added that it viewed deliberate food contamination as "a real and current threat".

**'Potential is There'**

The 45-page booklet entitled *Terrorist Threats to Food* (click for PDF file from WHO) warns of the potential insertion of pesticides, viruses and parasites in food as "a way of deliberately harming civilian populations".

It cites examples of intentional food attacks of the past, including a salmonella outbreak in the US state of Oregon.

In that incident, more than 750 people became ill, after members of a cult contaminated restaurant salad bars.

The WHO director of food safety, Jurgen Schlundt, said the booklet was not designed to alarm but rather to try to alert governments to boost their surveillance and emergency response measures.

"There has already been some examples of deliberate contamination of the food chain. It's only very few, but there has been some examples. And we do know that the potential is there," he said.

"The way to try to deal with it is to strengthen some of the systems that we already have in place, but they need in some cases strengthening of certain areas."

Mr Schlundt added that natural outbreaks show the potential dangers of food-borne disease.

He said about 1.5 million people already die each year due to diarrhoea-related illnesses caught from eating contaminated food.

The WHO says if terrorists deliberately add harmful agents, many more people could be left suffering from acute long-term effects, including paralysis, foetal abnormalities and increased rates of chronic illnesses like cancer (BBC, 2003).

**Title:** U.S. Agriculture Could Be Vulnerable To Terrorists
**Date:** February 21, 2003
**Source:** UCLA

**Abstract:** Could terrorists be lurking in fields and behind barns, ready to poison the plants and animals that provide the source of the nation's food?

It's not an impossible scenario, says Michael Harrington, executive director of the Western Association of Agricultural Experiment Station Directors.

"Nobody thought anybody would crash a plane into the World Trade Center, either," Harrington said. "If someone were intent on attacking the agricultural and food system it could be done."

Agri-terrorism could damage the economy, kill people or make them sick, and cause the kind of upheaval the nation went through when anthrax was found circulating through the mail, he said.

"You don't have to be a rocket scientist," said Harrington, who gave the keynote address recently at the 2003 International Chile Conference in Las Cruces. "You don't have to have access to nuclear materials."

Harrington said there have been at least five acts of agri-terrorism in the United States and 17 worldwide.

In one attack, he said, a radical group claimed responsibility for releasing Mediterranean fruit flies in California. The quarter-inch Medfly attacks more than 250 varieties of fruits, nuts and vegetables.

In 1997, a Medfly infestation threatened Florida's nearly $7 billion agricultural industry.

Agriculture accounts for about $1 trillion in economic activity each year in the United States, he said. As an example, he said, destruction of New Mexico's chili industry could cause a local economic impact of at least $250 million.

Arturo Jurado, a Las Cruces pepper farmer who is chairman of the New Mexico Chile Commission, said the long-term impact would be at least 10 times greater.

"We have to be prepared for it," he said. "The best thing is information ... knowing neighbors, know what they're doing and when they're doing it."

Other vulnerable areas include processing and transportation of food, Harrington said.

"The United States has had and continues to have the safest food supply in the world, so people are a little nervous talking about this, including myself," he said.

Concern over terrorist acts has caused the U.S. Agriculture Department to invest $328 million in agri-security, he said.

Researchers are developing animal vaccines and looking at breeding animals and plants with resistance to some toxic agents. Agricultural extension service agents are developing emergency plans and educating themselves about potential risks.

Harrington said the USDA and state agricultural schools are forming another emergency response network.

Some see endless possibilities for farm- and food-related terrorist acts.

"I think one of the biggest places to start is the international foods coming in," said Wes Eaton, who works at New Mexico State University in Las Cruces and attended the conference. "We need to guarantee that it's not laced with something" (UCLA, 2003).

**Title:** Federal Agencies Begin Bioterrorism Test
**Date:** March 25, 2003
**Source:** UCLA

**Abstract:** A crop-duster sprayed a harmless substance above a field of cattle and oil pumps Monday in a test to see if weather radar could detect a bioterrorist attack.

It was the first spray of a three-week Army test over central Oklahoma. The plane will make 261 runs, dropping grain alcohol, clay dust and a mix of water and polyethylene glycol -- a common ingredient in lotions and mascara.

The harmless materials were chosen to produce a mist resembling the airborne particles that might be produced by a bioterrorism attack.

The test, taking place in Oklahoma because of the state's advanced weather radar system, will help Army and Environmental Protection Agency scientists determine how well radar can detect such materials.

The new system would keep track of small planes and tiny puffs of particles that typical radars ignore. It will take weeks to analyze the data and determine how successful the test was, Army officials said.

The goal is to develop computer technology for a nationwide bioterrorism detection system, said Robert Lyons, with the Army's nuclear, biological and chemical detection program. The government hopes to install high-tech software in about 150 radar stations across the country.

The EPA has conducted similar tests in Maryland, Utah and Florida since early 2001, before the Sept. 11 terrorist attacks.

The government planned to start the test Feb. 24. But after residents of Goldsby complained, officials re-evaluated the program and deleted two of the originally planned test materials -- powdered egg whites and a sterilized natural pesticide. Those materials were sprayed over the ocean near Key West, Fla., last April with no ill effects (UCLA, 2003).

**Title:** Bioterrorism And The Food Supply
**Date:** October 1, 2004
**Source:** Directions Magazine

**Abstract:** The goal of terrorists is to strike fear in the hearts of their targets.This can take many forms. They may wish to cause death, shock, economic disruption, loss of faith in authorities, psychological trauma, dread, or just uncertainty.Perhaps the act that would most readily accomplish this would be an attack on the United States' food supply.Protecting the food supply has been a priority for public health officials for decades.Traditionally, industry and regulators have depended on spot-checks of manufacturing conditions and random sampling of final products to ensure safe food.This system is seen as more reactive than preventive because it finds problems after they have occurred rather than as the food is being prepared.

So what is at stake? Here are some interesting statistics about the food supply-chain in the United States.These are just from just the Mid-Atlantic region.

**Mid-Atlantic Food Supply**

- Number of farms = over 100,000
- Number of post-farm businesses = nearly 150,000
- Private Sector Food Business = over 12% of private sector businesses involve food
- Collective Sales = over $300 billion
- Employment = nearly 12% of the workforce

The introduction by terrorists of noxious or lethal materials into foods or beverages could result in undetected, rapid and widespread distribution within the food supply-chain that relies on distributed food production, processing and transportation firms.There are really three types of terrorist threats to the food supply.

**1.** The use of food or water as a delivery mechanism for pathogens, chemicals, and/or other harmful substances for the purpose of causing human illness or death.
**2.** The introduction of anti-crop or anti-livestock agents into agricultural systems.
**3.** The physical disruption of the flow of food/water as a result of the destruction of transportation or other vital infrastructure.

So how vulnerable is our food supply? That is a question that has been asked by scientists and government officials.The answer lies in an analysis of the "food" supply-chain.The supply chain begins with a vast number of producers (farms) and the numerous transportation, processing and distribution

facilities that are all part of bringing the food to the point of consumption.It is estimated that 98 percent of all U.S.farms are family farms.This small, highly distributed food production network creates security, monitoring and tracking challenges. Very large factory farms make up only 3 percent of the total farms but contribute more than 40 percent of the output.In addition to being vulnerable to terrorist attacks, this system makes it exceedingly difficult to trace back and identify the source of the contaminated food.

Figure 1 examines the likelihood of a bioterrorism attack against the U.S.food supply and the impact of such an attack.Four recent GAO reports found gaps in federal controls for protecting agriculture and the food supply.Local, state and federal officials must do even more to protect our food supply from tampering. A new comprehensive approach is needed if we are to safeguard our food supply.

1. Document the "food" supply-chain
2. Analyze risks and vulnerabilities
3. Identify critical control points
4. Establish monitoring procedures
5. Develop response plan
6. Develop reporting and tracking system
7. Develop system reliability checks

The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (the Bioterrorism Act) directs the Secretary of Health and Human Services to take steps to protect the public from a threatened or actual terrorist attack on the U.S.food supply.

Exempt from these regulations are the transportation vehicles that hold food only in the usual course of business.As you could imagine the ability to attack our food supply while in transit from the production site is a critical area and possibly the area that has the least amount of protection currently.It is important to recognize that this is only one of many exceptions granted under the act.

Protecting U.S.agriculture and ensuring safe and wholesome meat and poultry is one of the primary challenges facing USDA.The office of the Inspector General of the United States Department of Agriculture's chief missions is to ensure the safety of the food supply, both by auditing food safety programs to detect deficiencies and recommend improvements and by investigating criminal activity involving the intentional contamination of food products.They also monitor the processing and sale of adulterated meat, poultry, and egg products; and the substitution, adulteration or other misrepresentation of food products regulated or inspected by USDA.

**Technology**

The Department of Homeland Security in June 2004 announced the first Designations and Certifications under the Support Anti-terrorism by Fostering Effective Technologies (SAFETY) Act.The SAFETY Act provides liability limitations for makers and sellers of qualified anti-terrorism technologies, including those that may be used to protect the nation's food supply.DHS is also developing a new National Biodefense Analysis and Countermeasures Center (NBACC) to support the law enforcement and intelligence communities in their biodefense responsibilities.

The Center will apply the newest advances in science to the challenges both of biological threat characterization and of bioforensics, strengthening the nation's ability to determine the source of a biological agent used in an attack and strengthening deterrence.In June 2004, DHS announced its new Regional Technology Integration (RTI) initiative.RTI provides a mechanism for working directly with urban areas on infrastructure protection (including protection of the food supply) to develop and deliver new technologies as part of a regional security response.The program focuses on regional collaboration, private sector solutions, measurable objectives and continuous evaluation, and communicating best practices and lessons learned to other communities, states, Congress, the Administration, and other federal agencies.

The support is there.Now all that is needed is a workable platform that can provide an economically feasible solution to safeguarding our food supply.A critical component of this platform will, without question, be a GIS system that supports tracking and traceability.Incorporated into the platform will also be RFID capabilities to trace the product throughout the food supply-chain. These hybrid tags will also serve to detect tampering and integrated with new biosensors will alert food processors to possible contaminates.But this platform will not be cheap.The question is can the platform be developed and implemented in time to protect the population from a bioterrorist attack against our food supply? Only time will answer that question.

**Conclusion**

The food supply is by far the most vulnerable to a bioterrorism attack.This year we learned from news reports that terrorists have developed materials to manufacture salmonella and botulinum, and they may have intended to poison the food supply.Even more alarming was a *Washington Post* article on biological weapons developed by the South African government under the apartheid regime, including a biological agent created by splicing a common strain of E.coli with a toxin-producing gene from Clostridium perfringens.These are only a handful of examples of food bioterrorism that demonstrate the health and economic damage that could be inflicted through an attack on the food supply.

We need to continue to strengthen our food supply surveillance systems and improve communication and coordination among local, state and federal agencies to heighten the ability to recognize and quickly respond to food-borne outbreaks. This will not be cheap or able to be accomplished in a short period of time (Directions Magazine, 2004).

**Title:** Agroterrorism: Threats And Preparedness
**Date:** February 4, 2005
**Source:** U.S. Congress

**Abstract:** The potential of terrorist attacks against agricultural targets (agroterrorism) is increasingly recognized as a national security threat, especially after the events of September 11, 2001. Agroterrorism is a subset of bioterrorism, and is defined as the deliberate introduction of an animal or plant disease with the goal of generating fear, causing economic losses, and/or undermining stability. Attacks against agriculture are not new, and have been conducted or considered by both nation-states and substate organizations throughout history.

The results of an agroterrorist attack may include major economic crises in the agricultural and food industries, loss of confidence in government, and possibly human casualties. Humans could be at risk in terms of food safety or public health, especially if the chosen disease is transmissible to humans (zoonotic). Public opinion may be particularly sensitive to a deliberate outbreak of disease affecting the food supply. Public confidence in government could be eroded if authorities appear unable to prevent such an attack or to protect the population's food supply.

Agriculture has several characteristics that pose unique problems for managing the threat. Agricultural production is geographically disbursed in unsecured environments. Livestock are frequently concentrated in confined locations, and then transported and commingled with other herds. Pest and disease outbreaks can quickly halt economically important exports. Many veterinarians lack experience with foreign animal diseases that are resilient and endemic in foreign countries.

Agriculture and food production generally have received less attention in counter-terrorism and homeland security efforts. But more recently, agriculture has garnered more attention in the expanding field of terrorism studies. Laboratory and response systems are being upgraded to address the reality of agroterrorism. Congress has held hearings on agroterrorism and enacted laws and appropriations with agroterrorism-related provisions.

The executive branch has responded by implementing the new laws, issuing several presidential directives, and creating liaison and coordination offices. The Government Accountability Office (GAO) has studied several issues related to agroterrorism.

Appropriations and user fees for USDA homeland security activities have about doubled from a $156 million "pre-September 11" baseline in FY2002 to $325 million in FY2004. Two supplemental appropriations acts added nearly $110 million in both FY2002 and FY2003. For FY2005, the department requested $651 million in appropriations and user fees, but only certain agroterrorism-related items were specifically mentioned in committee reports. The President's budget proposal for FY2006 will summarize the enacted FY2005 homeland security funding for USDA.

In addition to appropriations activity, bills addressing agroterrorism preparedness and coordination among agencies are likely to be introduced in the 109th Congress. A GAO report on coordination between USDA and DHS is expected by March 1, 2005. This report will be updated as events warrant (U.S. Congress, 2005).

**Title:** Analyzing A bioterror Attack On The Food Supply: The Case Of Botulinum Toxin In Milk
**Date:** April 20, 2005
**Source:** PubMed

**Abstract:** We developed a mathematical model of a cows-to-consumers supply chain associated with a single milk-processing facility that is the victim of a deliberate release of botulinum toxin. Because centralized storage and processing lead to substantial dilution of the toxin, a minimum amount of toxin is required for the release to do damage. Irreducible uncertainties regarding the dose–response curve prevent us from quantifying the minimum effective release. However, if terrorists can obtain enough toxin, and this may well be possible, then rapid distribution and consumption result in several hundred thousand poisoned individuals if detection from early symptomatics is not timely. Timely and specific in-process testing has the potential to eliminate the threat of this scenario at a cost of <1 cent per gallon and should be pursued aggressively. Investigation of improving the toxin inactivation rate of heat pasteurization without sacrificing taste or nutrition is warranted.

Among bioterror attacks not involving genetic engineering, the three scenarios that arguably pose the greatest threats to humans are a smallpox attack, an airborne anthrax attack, and a release of botulinum toxin in cold drinks (1). The methods of dissemination in these three scenarios are, respectively, the person-to-person spread of a contagious disease, the outdoor dispersal of a highly durable and lethal agent, and the large-scale storage and production and rapid widespread distribution and consumption of beverages containing the most poisonous substance known. The first two scenarios have been the subject of recent systems modeling studies (2–5), and here we present a detailed systems analysis of the third scenario. For concreteness, we consider a release in the milk supply, which, in addition to its symbolic value as a target, is characterized by the rapid distribution of 20 billion gallons per year in the U.S.; indeed, two natural Salmonella outbreaks in the dairy industry each infected 200,000 people (6). Nonetheless, our methods are applicable to similar food products, such as fruit and vegetable juices, canned foods (e.g., processed tomato products), and perhaps grainbased and other foods possessing the bow-tie-shaped supply chain (PubMed, 2005).

**Title:** Targets For Terrorism: Food And Agriculture
**Date:** January, 2006
**Source:** CFR

**Abstract: Is America's food supply safe from terrorist attacks?**

No. The United States spends more than $1 billion every year to keep America's food supply safe, but even without terrorism, food-borne diseases cause about 5,000 deaths and 325,000 hospitalizations each year, according to the Centers for Disease Control and Prevention (CDC). Former Secretary of Health and Human Services Tommy Thompson told a congressional terrorism panel in November 2001 that he

was “particularly concerned” about food-related terrorism, which could involve either attempts to introduce poisons into the food supply or attacks that would ruin domestically cultivated crops or livestock. **Have there been past terrorist attacks in the United States involving food?**

Yes. In 1984, members of an Oregon religious commune—followers of an Indian-born guru named Bhagwan Shree Rajneesh—tried to influence a local election by poisoning salad bars with salmonella bacteria to sicken voters. Although no one died, 751 people became ill. There have been a couple of other attempts to deliberately contaminate food with biological agents since World War II, but these have been criminal acts, not terrorism.

There have been no documented terrorist attacks on U.S. agriculture. But the number and variety of food-borne illnesses and crop and livestock diseases make it hard to distinguish terrorist attacks from natural events. It took a year for U.S. officials to conclude that the Oregon attack was deliberate.

**How might terrorists attack the food supply?**

The Oregon attack took place at local restaurants, near the end of the food-distribution chain, but an attack could occur at any point between farm and table. Imported food could be tainted with biological or chemical agents before entering the United States, or toxins could be introduced at a domestic food-processing plant. Crops or livestock raised on American soil could also be targeted. Experts also worry that terrorists might try to spread false rumors about unsafe foods via the mass media or the Internet.

**How much damage could an attack on the U.S. food supply cause?**

Some attacks could cause illnesses and deaths, depending upon how quickly the contamination was detected. But even attacks that don’t directly affect human health could cause panic, undermine the economy, and even erode confidence in the U.S. government, experts say. Agriculture exports amount to about $140 billion a year, and many American jobs have at least an indirect connection to food and agriculture. A 1970s plot by Palestinian terrorists to inject mercury into Jaffa oranges reduced Israel’s exports of citrus fruit to Europe by 40 percent, and a 1989 incident in which a shipment of Chilean grapes to the United States tested positive for cyanide led to international trade suspensions that cost Chile $200 million. The U.S. Department of Agriculture estimates that an attack on livestock—a successful attempt to infect American cattle with a contagious disease such as foot-and-mouth, for example—could cause between $10 billion and $30 billion in damage to the U.S. economy.

**What kinds of terrorists might mount a food-related attack?**

We don’t know. Concerns about such attacks have grown since September 11. Some forms of attack wouldn’t require a large or highly skilled organization and could come from foreign groups like Osama bin Laden’s al-Qaeda network, domestic terrorists, eco-terrorists, a cult-like group such as Oregon’s Rajneeshees, or an unaffiliated individual—anyone who wanted to undermine the economy and spread panic. Elsewhere, groups that have threatened agroterrorist attacks include Tamil militants in Sri Lanka and British activists opposed to chemical and biological warfare.

**Who is in charge of food safety?**

The two main agencies are the Food and Drug Administration (FDA), which is part of the Department of Health and Human Services, and the Food Safety and Inspection Service (FSIS), a part of the Department of Agriculture. The FSIS handles meat, poultry, and egg inspections, and the FDA inspects everything else. State and local agencies, other federal bodies, and foreign inspection services are also sometimes involved in food safety.

Many experts have long favored consolidating food-safety programs in a single agency, and calls for a consolidation have been repeated since September 11. But food manufacturers and some members of Congress have grown accustomed to the current system and oppose its overhaul (CFR, 2006).

**Title:** Responding To The Threat Of Agricultural Bioterrorism
**Date:** November 9, 2006
**Source:** Directions Magazine

**Abstract:** In October 2004, Kevin Coleman discussed the susceptibility of the U.S. food supply chain to bioterrorist attack. Given events surrounding the recent E. coli outbreak in spinach grown in the U.S., now is an ideal time to revisit the subject of food safety by expanding upon the place of agriculture in the United States and some of the ways in which geospatial technology, and its practitioners, can address this area of homeland security.

The vital roles played by agriculture (and those employed in that sector of our economy) are largely underappreciated by many people. These roles include the provision of food, maintenance of healthy ecosystem function, and enhancement of aesthetic qualities. However, the "selling point" most often used to convey the importance of agriculture, and to capture the attention of decision makers, is simple economics. Various reports published by the U.S. Department of Agriculture's (USDA) Economic Research Service (ERS) show that agriculture is a multi-billion dollar industry, with the total value of agricultural products exceeding $117 billion dollars, and that of agriculture and related industries topping $563 billion.

While many of the plant and animal products grown or raised in the U.S. are used domestically, a significant portion is also exported to other nations. In 2004, total U.S. agricultural exports were estimated at $61.4 billion - with agriculture being one of the few trade sectors in which the U.S. often exports a higher value commodity than we import. While these national figures are certainly impressive, the economics of agriculture is perhaps even more important at the state and county scales. Consider, for instance, that farm income accounts for over 30% of the total income in many rural U.S. counties.

So, the "grand challenge" for domestic food safety and security programs is then twofold: To ensure access to a safe, reliable and inexpensive food supply and, at the same time, to maintain the profitability of plant and animal production systems. However, our collective ability to meet this challenge is under constant threat.

We face, for example, the nearly impossible task of stopping invasive pests and introduced pathogens from entering the country. Unfortunately, the number of such introductions will not only continue, but likely increase, if for no other reason than sheer logistics. In fiscal year (FY) 2005, the U.S. imported nearly 27 million metric tons of agricultural products (excluding wine and malt beverages). Of this amount, significantly less than 5% was subjected to thorough inspection. Despite this low inspection rate, the Department of Homeland Security's Customs and Border Protection agency seized a daily average of over 1,100 prohibited agricultural products at ports of entry in FY 2005, including 147 agricultural pests.

The financial impact of disease and pest management is significant, costing the agricultural industry in the neighborhood of $3 billion per year. The projected economic impact of one disease alone, Asian soybean rust (first introduced into the U.S. in 2004), is upwards of $2 billion. This, and future introductions may result in restrictions on domestic and foreign trade, disruptions in food production, changes in consumer perceptions and confidence, and employment declines within all aspects of agriculture and food markets.

Given the monetary importance of the agricultural sector, it is not an overstatement to say that the economic well-being of the nation, and that of many rural communities, is susceptible to significant disruption. Several additional factors further expose U.S. agriculture to the harm posed by natural and intentional introductions of pests and pathogens. These "multiplying" factors include a genetic simplification of planted landscapes and food animal lines that makes crops and livestock more susceptible to disease, the difficulty of monitoring plant and animal conditions (i.e., situational awareness) over large geographic areas, and the concentrations of crops and livestock production at local and

regional scales.

One framework which can be used to plan for and execute our response to agricultural biosecurity events is the emergency response cycle outlined by hazards researchers. Here the term "hazard" is considered broadly, and can be applied equally to natural events, technological failures and biological agents. The cycle of emergency response begins with "preparedness" - how people and places plan to deal with a hazard event. Eventually, a disaster happens (such as a tornado) and it tests how well we have prepared for that hazard. We respond to the emergency by rescuing people and addressing other immediate threats to life, limb and property. Following response is the recovery stage, which includes "cleaning up" after the disaster and other efforts geared toward getting back to "normal" conditions. Next, and often concurrent with the later recovery activities, is the mitigation phase. Here, the disaster and our reaction to it are assessed, and ways to improve preparedness, response and recovery are identified. Finally we transition back to the preparedness stage, await the next hazard and begin the whole process again.

This same emergency response cycle can be used to guide our actions in the event of a biological hazard and, I believe, contribute to an operational definition of food safety and agricultural biosecurity:

*"The ability to develop, maintain, and execute a rapid and effective emergency response to disease outbreaks and invasive species in order to ensure a safe, constant, and profitable supply of food, feed, and fiber."* (Author's unpublished quote)

Geospatial technologies have played, and will continue to play, a key role in the development, maintenance and execution of emergency response cycles related to food security and agricultural biosecurity events. One example that illustrates this role is a spatial model for locating large-scale livestock carcass disposal sites.

Consider for a moment a scenario where Foot and Mouth Disease (FMD) is detected in beef cattle within a commercial feedlot. After confirming the diagnosis, the relevant state department of agriculture working in conjunction with the USDA will implement some form of an animal carcass disposal plan. That plan will involve destroying cattle from the affected feedlot, as well as those from neighboring operations within an established quarantine zone, to prevent the spread of the disease. For some states, such as Kansas, the preferred disposal mechanism is burial. The next logical question to ask, then, is where to bury as many as several hundred thousand head of cattle found within the quarantine zone?

To help solve this problem, we can view and simultaneously analyze a series of thematic data layers in a GIS-based landscape suitability model to prepare our emergency response. Geographical datasets including environmental and cultural information related to soils, geology, water resources, transportation networks, threatened and endangered species, and population can be combined into automated digital workflows using functionality built into commercial GIS software packages. The model created for the State of Kansas currently uses twelve data layers that represent "exclusion criteria" developed by the Kansas Department of Health and Environment (KDHE). These data are then subjected to various geoprocessing procedures to produce maps that identify the cumulative geographic area falling within the spatial extent of one or more of the predefined exclusion criteria - in other words, the least preferred sites for carcass burial.

Running this model yields results such as that shown here for Finney County, Kansas. Green areas on the map represent locations that do not violate any exclusion criteria and, therefore, would be preferred burial sites. Based upon the KDHE exclusion criteria, nearly 40% of the county would be unsuitable for animal burial. It is important to note that licensed animal feeding operations are required by the state to develop a plan for onsite livestock burial. However, a visual comparison between actual feedyard locations (not shown on map for security reasons) and preferred mass burial locations indicates a potential flaw in this strategy - and that onsite burial may not actually be in the long term interests of regional populations.

Given the automated nature of this method, emergency managers now have a sound procedure, based upon good science, for rapidly identifying suitable burial sites before and during an event. The ability to

"pre-emptively" target preferred sites for burial is especially helpful when negotations are required to obtain burial rights on private lands.

After the September 11, 2001 terrorist attacks, several post-event analyses have highlighted the importance of both GIS and geographic data in providing rapid and effective emergency response. Summarized from Galloway (2003), some of those key findings include:
**1.** Having geographic datasets for critical infrastructure already developed and on-hand prior to an emergency
**2.** Having the human and information technology infrastructure in place to facilitate sharing geographic information
**3.** The importance of graphical forms of communication, such as maps, in conveying information to both decision makers and the public
**4.** Having made a "pre-response" investment in developing relevant decision support tools

We must take these hard lessons learned in the aftermath of intentional attacks on urban centers and apply them equally, and urgently, to the area of agricultural biosecurity. As noted by Senator Pat Roberts (R-Kansas) in 2001, our nation's crops and livestock are at very high risk. It is time for the U.S. to make an appropriate investment in food safety and security (Directions Magazine, 2006).

**Title:** Al-Qaida's Food Bioterror Threat Looms Over UK
**Date:** June 6, 2011
**Source:** Times of India

**Abstract:** Britain is facing an emerging food "bioterrorism" threat from extremist groups like the al-Qaida, a media report said on Sunday.

The British government's security advisers have warned manufacturers and retailers that terror groups might try to poison food, drinks supply in the country to cause widespread casualties, 'The Sunday Telegraph' reported.

The warning from Centre for the Protection of National Infrastructure (CPNI), which operates as part of the security service, came in the wake of deadly E.coli outbreak in Germany which has highlighted the vulnerability of the food chain and how quickly bacteria can spread, the report said.

The highly virulent strain has already claimed some 18 lives and left more than 1,800 seriously ill in Germany.

The CPNI has, in fact, asked food and drinks producers, suppliers and supermarkets to tighten security at plants and depots.

A CPNI said, "UK suffers from a low level of malicious contamination of food by the bad, the mad and the sad. Now it has to consider possibility of food supplies being disrupted by politically motivated groups" (Times of India, 2011).

**Title:** Illinois Partnership Aims To Stop The Threat Of Agro-Terrorism
**Date:** February 3, 2012
**Source:** Bio Prep Watch

**Abstract:** An Illinois partnership between agriculture organizations and law enforcement agencies hopes to protect Illinois food systems, farms and consumers from the threats of agro-terrorism.

The Illinois Agro-Security Working Group looks to raise awareness of these issues among those in the food production and agriculture industries. The group, which is a service of the Illinois Farm Bureau, was created to educate farmers on how best to report, recognize and prevent terrorist and criminal activities related to Illinois agriculture, Drovers reports.

“Illinois farms are more vulnerable to terrorist activity than most people realize,” Dave Patton, the field operations manager with the IFB, said, according to FarmweekNow.com. “There have been some cases in other states where a person noticing suspicious behavior has helped capture a would-be terrorist, so we know agro-terrorism is a real threat.”

A brochure has been given to agriculture producers in the state that provides information and resources in the battle against agro-terrorism, including how to report suspicious activities and the signs of illnesses.

“The brochure doesn’t necessarily provide farmers with a comprehensive list of things to watch for, but it certainly gives them a good starting point,” Jim Kaitschuk, the executive director of the Illinois Pork Producers Association, said, according to FarmweekNow.com. “Ultimately, our producers know their animals and their operations better than anyone else and they need to be the instigators when it comes to reporting any potential threat.”

Other organizations involved in the group aside from the FBI and the IFB include the Illinois Pork Producers, Illinois Beef Association and the Midwest Dairy Association (Bio Prep Watch, 2012).

**Title:** Expert Warns Of Bioattack On U.S. Cattle Industry
**Date:** February 21, 2012
**Source:** Bio Prep Watch

**Abstract:** According to a terrorism expert, a low-tech biological attack on the cattle industry of the United States using virulent foot and mouth disease may be a simple way for terrorists to damage the economy.

According to an article in the FBI’s Law Enforcement Bulletin, Dean Olsen, a former commander of the Douglas County Sherriff’s Department in Omaha, Neb., said that agroterrorism has become more attractive to terrorists dealing with dwindling resources and leadership. Such an attack would lead to major economic stress, but would be relatively simple and cheap to implement, Government Security News reports.

“Every level of the food chain, including farms, feedlots, chemical storage facilities, meatpacking plants, and distribution operations, remains vulnerable to agroterrorism,” Olsen said, according to Government Security News.

Olsen, who participated in the regional Joint Terrorism Task Force before his retirement in 2008, recommended that law enforcement agencies put plans into place to prevent such attacks before they happen. He said that experts agree that foot and mouth disease, which can affect cloven hoofed animals like deer, pigs, sheep and cattle, is the most ominous threat to the food chain in the U.S.

Olsen said that an outbreak could be spread to 25 states in five days when animals are moved from one farm to another. He warned that law enforcement officers investigating livestock thefts should look at them from an agroterror perspective and that such incidents should be reported to their state intelligence fusion centers or threat-integration centers (Bio Prep Watch, 2012).

**Title:** Department Of Homeland Security Revises Kansas Biosafety Lab Assessment
**Date:** March 6, 2012
**Source:** Bio Prep Watch

**Abstract:** The U.S. Department of Homeland Security has revised an assessment of the proposed high-level animal biosafety lab in Kansas, dramatically lowering the assessed likelihood that Foot and Mouth Disease would escape.

In a 923 page risk assessment released on Friday, the DHS estimated that the risk that FMD would escape from the National Bio and Agro-Defense Facility during the facility's 50 year lifespan was less than 0.11 percent. When excluding catastrophic events such as tornadoes and earthquakes, the risk drops below 0.008 percent, Nature reports.

The previous risk assessment in 2010 estimated the risk of such an event was 70 percent. The National Academies concluded that the 2010 assessment had multiple major shortcomings. The academies will evaluate the new risk assessment later this spring.

"(The new risk assessment) reaffirms that we can build a safe and secure facility to meet this important mission," Tara O'Toole, the DHS under secretary for science and technology, said, according to Nature.

Bill Dorsett, a member of the group No NBAF in Kansas, questioned the validity of the new assessment.

"There's no way that an analysis can get it down that precisely," Dorsett said, according to Nature. "Because a big portion of the risk has to do with people and people's behavior. That starts with congressional funding for the lab — and continued congressional funding for its maintenance. We're trying to predict what Congress will do ten years down the line."

Congress provided the lab with $50 million in funding in 2012 on the condition of the new risk assessment and its appraisal by the National Academies. President Obama's 2013 budget proposal did not request any money for the construction of the lab. The proposal also impels the National Academies to evaluate whether present disease threats justify the potential $1 billion costs of the facility (Bio Prep Watch, 2012).

**Title:** Congress Should Take Agroterror Threat Seriously, Expert Says
**Date:** March 12, 2012
**Source:** Bio Prep Watch

**Abstract:** According to an editorial by Tom Quaife of the Dairy Herd Network, the threat of agroterrorism should be taken much more seriously by members of Congress and the Obama administration.

Quaife has attended four agroterrorism conferences sponsored by the Federal Bureau of Investigation since 2005. Upon seeing the seriousness of the issue and simulations of how quickly infectious animal diseases could spread within the United States, he said that it has been difficult watching the uncertainty behind the proposed animal disease testing facility in Manhattan, Kan., Dairy Herd Network reports.

"It's been hard to watch the political haggling that is taking place over the proposed National Bio- and Agro-Defense Facility in Manhattan, Kan.," Quaife said, according to Dairy Herd Network. "The Obama administration wants to reassess the cost and scope of the project and Congress has been slow to approve funding."

According to Quaife, if an international attack were to occur on the world's food supply, it could cost billions of dollars and undermine the public's confidence. While Quaife was comforted that the proposed state-of-the-art facility would be built to address agroterrorism threats, he is concerned that the facility wouldn't be operational until 2018.

"The need is there and a plan is in place to address it," Quaife said, according to Dairy Herd Network. "It is time that the Obama administration and Congress start paying attention to the threat and back it up with a solid commitment to the NBAF" (Bio Prep Watch, 2012).