

Agroterrorism and Public Health: Reestablishing an Old Relationship

**Satellite Conference
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**Produced by the Alabama Department of Public Health
Video Communications Division**

Faculty

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Historic Milestones

- **1700's: Dr. E. Jenner's use of cowpox immunization to protect against Smallpox Disease**
- **1884: Dr. Louis Pasteur's development of the Rabies Vaccine and the process of pasteurization to eliminate Tuberculosis and Brucellosis in milk**

Historic Milestones

- **U.S. society has evolved from a primarily agrarian lifestyle in 1900 to an urban setting today with a mere 3% of our population in farming or ranching as of the year 2000**

Agriculture's Economic Impact

1 in 8 Americans work in occupations directly supported by food production. 2001 food production represented 9.7% of the U.S. GDP with cash revenue of \$991 billion

Agro-terrorism is defined as the deliberate introduction of a disease agent into livestock herds for the purposes of undermining socio-economic stability and/or generating fear. Depending on the disease agent and pathogenic vector chosen, agroterrorism is a tactic that can be used to cause mass socioeconomic disruption or as a form of direct human aggression.

(Office of Science and Technology, Policy Blue Ribbon Panel, December 2003)

Agriculture's Vulnerabilities to Terrorist Attacks as Well as Naturally Occurring Outbreaks are a Result of Multiple Factors:

- Wide geographic distribution of different facets of agriculture
- Concentration and intensive production practices of various segments of agribusiness, which can increase the potential speed of introduced disease spread

Agriculture's Vulnerabilities to Terrorist Attacks as Well as Naturally Occurring Outbreaks are a Result of Multiple Factors:

- Insufficient agricultural biosecurity and surveillance
- Producer hesitation to promptly report disease outbreaks due to concern about quarantine and/or culling of their herd

Agriculture's Vulnerabilities to Terrorist Attacks as Well as Naturally Occurring Outbreaks are a Result of Multiple Factors:

- Limited number of veterinarians and laboratories trained to recognize foreign animal diseases (FADs)

Accidental Disease Introduction is Facilitated By:

- International travel
- International commerce
- Importation of fresh food items in bulk
- Importation of exotic animals
- Migratory birds

Public Health Significance of Agroterrorism

- All Category A biological threat agents, with the exception of smallpox, and all Category B threat agents, with the exception of Ricin Toxin, are zoonotic

Category A Diseases/Agents

High-priority agents include organisms that pose a risk to national security because they:

- Can be easily disseminated or transmitted from person to person
- Result in high mortality rates and have the potential for major public health impact
- Might cause public panic and social disruption; and require special action for public health preparedness.

Category A

- Anthrax
- Botulism
- Plague
- Smallpox
- Tularemia
- Viral hemorrhagic fevers (filoviruses [e.g., Ebola, Marburg] and arenaviruses [e.g., Lassa, Machupo])

Category B Diseases/Agents

Second highest priority agents include those that:

- Are moderately easy to disseminate
- Result in moderate morbidity rates and low mortality rates
- Require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance

Category B

- Brucellosis
- Epsilon toxin of *Clostridium perfringens*
- Food safety threats (e.g., *Salmonella* species, *Escherichia coli* 0157:H7, *Shigella*)
- Glanders
- Melioidosis
- Psittacosis
- Q fever
- Ricin toxin (castor beans)

Category B (continued)

- Staphylococcal enterotoxin B
- Typhus fever
- Viral encephalitis (alphaviruses [e.g., Venezuelan equine encephalitis, eastern equine encephalitis, western equine encephalitis])
- Water safety threats (e.g., *Vibrio cholerae*, *Cryptosporidium parvum*)

Category C Diseases/Agents

Third highest priority agents include emerging pathogens that could be engineered for mass dissemination in the future because of:

- Availability
- Ease of production and dissemination
- Potential for high morbidity and mortality rates and major health impacts

Emerging infectious diseases such as NIPAH virus and HANTA virus

Zoonotic Disease

- A zoonotic disease is transmissible from animals to man or shared by animals and man

Why Use a Biological Agent vs Explosive, Chemical or Nuclear Device?

- **Delayed onset**
- **Difficult to define origin**

Consider Foot and Mouth Disease (FMD)

- **2001 U.K. outbreak cost \$14.5 billion to contain**
- **Eradication procedures**
 - **Depopulation**
 - **Disposal**



Courtesy of Dr. Wenzel, Auburn University, AL



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U.S. Experience With BSE In 2004

- **U.S. beef exports drop 83%**
- **Loss of approximately \$2 billion**
- **1 BSE positive case in December 2003**

West Nile Virus in the U.S.

- Identified in New York City in 1999
- How did it arrive?
 - Infected human
 - Imported vertebrate host
 - a. Legal
 - b. Illegal
 - Imported vector
 - Storm blown bird
 - Intentional introduction discounted

West Nile Virus in the U.S.

- Transcontinental spread in 3 years
- Largest arboviral M/E epidemic documented in western hemisphere
- Large equine and avian epizootics
- Newly recognized clinical syndromes
- Newly recognized modes of transmission

Monkey Pox in 2003

- Prairie dogs infected by imported Gambian giant pouched rats
- 72 suspected cases of Monkey Pox, 37 confirmed

Severe Acute Respiratory Syndrome (SARS)

- Coronavirus present in a group of animals, including civet cats in China
- 70% of the animal handlers in China had antibodies to the new SARS-CoV.
- Human to human transmission

Avian Influenza A

- Current major outbreak of (H2N1) in 8 Asian countries with 34 confirmed human cases in 2004 and 23 fatalities
- 1957 Pandemic of Asian Flu (H2N2)
- 1968 Pandemic of Hong Kong Flu (H3N2)
- 1918 Pandemic of Influenza (H1N1) infected more than 20 million people

Terrorist Targeting of Civilian Population

- Japan - Tokyo Aum Sherkio-Cult, 12 dead, 6,000 sick from subway Sarin Gas attack in 1995
- U.S. - Salad bar Salmonella-Cult Attack in 1984
- U.S. - Oklahoma Federal Building in 1995
- U.S. - Olympic Games in Atlanta in 1996

Terrorist Targeting of Civilian Population

- U.S. - World Trade Center, Pentagon, Pennsylvania flight crash, September 11, 2001
- Anthrax letters, September 11, 2001

Soviet Biological Warfare Program Agents

- Anthrax
- Plague
- Tularemia
- Glanders
- Small Pox

Soviet Biological Warfare Program Agents

- Ebola Virus
- Marburg Virus
- Venezuelan Equine Encephalomyelitis Virus

Why Target Food?

- We all need it
- Vulnerable at many points of production and distribution
- Will support life and growth of biological agents
- Agents are cheap and easy to acquire and disseminate

Why Target Food?

- Difficult to detect due to delayed effects
- Can generate public panic following attack

Food As A Target

- More than 200 known human illnesses are transmitted through food
- Wide spectrum of possible agents, bacteria, viruses, parasites, prions, toxins, chemicals, metals
- Possible to target high risk groups: children, the aged, immunosuppressed

Tactics of Food Targeting

- Select foods that are ready to eat: fruits, vegetables, salads and dairy items
- Use heat tolerant biotoxins
- Centralized food processing means one facility could affect millions
- Imported foods could be contaminated before shipment
- Target groups could be attacked during delivery to the final receiving point

What Are We Doing About These Threats?

- International
- National / Federal
- State (Alabama)
- Local

International Initiatives

- World Health Organization
- European CDC in formation
- Enhanced international security cooperation

National/Federal Initiatives

- Federal efforts were initiated in 1995, accelerated in 2001
- Enhanced border security (travelers, imports, more inspectors and enforcement)
- Initiated threat risk assessment and identified vulnerabilities, capacities and established national priorities

National/Federal Initiatives (continued)

- Initiated significant funding to address federal and state vulnerabilities based on relative risk and national priorities
- Proposed funded initiatives to build surveillance, laboratory and response infrastructure at the state and local level

Identified Vulnerabilities Were:

- Early warning systems
- Rapid detection and identification systems
- Emergency response plans
- Training and exercising

Identified Vulnerabilities Were: (continued)

- Availability of surge capacity
- Medical/Veterinary response, ability to manage casualties, availability of countermeasures, (i.e. biologics, therapeutics, reagents)

Note: Strategic National Stockpile (SNS) is to include prioritized veterinary biologicals and therapeutics.

Identified Vulnerabilities Were (continued)

- Myriad possible vectors, reservoirs, pathobiology, etc.
- Containment and quarantine procedures (Note: New F.D.A. Recall Authority)
- Remedial measures, decontamination and disposal

State Responses

- Enhancing laboratory capabilities
- Coordinating collective command, control, communications and information planning capabilities
- Training for surveillance and alert capabilities
- Designating and training staff for emergency preparedness
- 39 states currently have an identified public health veterinarian

Local Responses (Alabama)

- Area Emergency Preparedness Coordinators
- County level participation

Alabama Responses

- 2003 total HHS funding of almost \$23 million
- Broad based improvement in all facets of public health emergency preparedness

Veterinary Capabilities

- Advantage of two veterinary schools, Auburn and Tuskegee in the state
- Well developed statewide public health interface at the county level with veterinary practitioners as a result of longstanding rabies control program

Public Health / Veterinary / Agriculture Interfaces

- All Licensed Veterinarians incorporated in the Health Alert Network
- Department of Public Health, Department of Agriculture, and Bioterrorism and Emergency Preparedness Committees incorporate representatives from each other to assure a coordinated response

Interfaces (continued)

- Public Health Grant to both university veterinary schools to collaboratively develop and provide statewide educational programs for veterinary practitioners and livestock producers in agroterrorism issues, (i.e. recognition of Foreign Animal Diseases (FADs), biosecurity, reporting of suspected incidents and approaches for dealing with a disease outbreak)

Interfaces (continued)

- Coordinating department level collaborations on surveillance efforts, diagnostic laboratory interactions and exploring integration of information management systems with the two veterinary schools and the veterinary diagnostic laboratories.
- Joint emergency notification on call listing of personnel
- Interactive support of the state level Veterinary Medical Association

Lessons Learned

- Incident with 9 dead cows discovered under a bridge March 2004

Future Efforts

- Strengthen communication linkages between government agencies (Federal/State/Local) and foster clear understanding of roles
- Continuing education for all facets of the emergency response team (Personnel Turnover)
- Exercise/validate plans and processes at all levels

Future Efforts

- Communications: In other words, managing the event while providing timely accurate information to the media/public/participants
- Develop strategies for immediate, short term and long term consequence management

“Preparing the nation to address the threat of terrorism is a formidable challenge, but the consequences of being unprepared could be devastating.”

(U.S. CDC Strategic Plan, 2000) CFIA-ACIA

Upcoming Programs

**Obesity and Family Planning:
Reproductive Health Impacts
Wednesday, June 30, 2004
2:00-4:00 p.m. (Central Time)**

**Bugs & Drugs
Wednesday, July 14, 2004
2:00-4:00 p.m. (Central Time)**

Upcoming Programs

**South Central Center for
Public Health Preparedness
(Topic to be announced)
Tuesday, July 20, 2004
12:00-1:30 p.m. (Central Time)**

**Parkinson’s Disease
(Home Health Aides & Attendants)
Wednesday, July 21, 2004
2:00-4:00 p.m. (Central Time)**

**For a complete listing of
upcoming programs,
visit our website:
www.adph.org/alphtn**