The Science of Agroterrorism

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Ancient Tactic
(sieges, battles, wars)

• Burn fields
• Poison wells
• Catapult dead/diseased animals over castle walls
• Etc.
Agricultural Bioterrorism (Agroterrorism)

- **Biological Warfare** – Use of disease to harm or kill military/civilians, food, or livestock
- **Agroterrorism** – Intentional Attack on Agriculture Infrastructure- Bio Weapons

- Assumption - Risks Have Increased for Intentional Introduction of Diseases (Human & Animal)
Relevant Terms

- **Reservoir** – the species or location where the disease organism is typically found, often asymptomatic
- **Zoonotic** – A disease with an animal reservoir that can be passed to humans
- **Contagious** – Disease or agent that can be passed from one person to another
  - Levels of contagiousness: high, moderate, low, none
  - Indirect transmission (insect or animal vector)
  - Specific activity (venereal, blood borne)
- **FAD** – Foreign Animal Disease
  - Diseases that are not naturally in the U.S. or were eliminated from the U.S. after an eradication effort
  - Trade as well as health issues
- **Quarantine** - To stop the movement of animals into or out of an area. To isolate an individual, herd, area, state, nation, etc.
Types of Bioterrorism Agents

- Human disease / reservoir
  - Smallpox, Cholera, Shigellosis - contagious
- Zoonotic disease
  - Domestic or wildlife animal reservoir
  - Anthrax, Brucellosis, Tularemia, Plague, Encephalitis, Ebola, & Q Fever – most minimally contagious
- Animal disease
  - Foreign Animal Diseases (FAD): ASF, FMD, Avian Influenza, New Castle, Rinderpest, Hog Cholera
- Why Zoonotic?
  - Controllable, Many in nature
  - Animal Models – Politically Legitimate to Research
Potential Bioterrorism Agents (CDC categories)

Category A

- Easily transmitted from person-to-person
- High mortality rates
- Potential for major public health impact
- Can cause panic and social disruption
- Requires special action for public health preparedness
- Anthrax, Botulism, Plague, Smallpox, Tularemia, Viral hemorrhagic fevers (Ebola, Marburg, Lassa, Machupo)
Potential Bioterrorism Agents (CDC categories)

Category B

- Moderately easy to disseminate
- Moderate morbidity and low mortality rates,
- Brucellosis, Glanders, Melioidosis, Psittacosis, Q Fever, Typhus fever, Viral encephalitis Toxins (bacterial and plant), Food Safety, Water Safety
Potential Bioterrorism Agents (CDC categories)

**Category C**

- Emerging pathogens
- Could be engineered for mass dissemination
- Available, easy production and dissemination
- Potentially high morbidity and mortality
- Major health impact
- *Nipah (Nipah virus), Hantavirus (Hantavirus)*
Bioterrorism Pathogens For Livestock - Criteria

- Highly Infectious & Contagious
- Good Ability to Survive in Environment
- Predictable Morbidity/Mortality
- Pathogenic for Livestock & Poultry
- Available & Easy to Acquire or Produce
- Attributable to Natural Outbreak – Deniable
- Easily Disseminated
Awareness of a Bioterrorism Threat

- Producers and Practicing Veterinarians
  1st Line of Defense
- Sudden, Unexplained Death Loss
- Severe Illness Affecting High % of Herd
- Vesicles (Blisters) - Mouth & Hooves
- Unusual External Parasites
- CNS signs
Bioterrorism Directed Toward U.S. Livestock/Poultry Industry

- FMD is likely agent of choice of terrorists
- Other possible agents – TB, Brucellosis, Avian Influenza, Hog Cholera, & New Castle
- Human health impact minimal
  - Psychological and economic
- Devastating economic implications to livestock industry
- Possible attacks on processing plants
  - (Meat, Milk, Eggs)
Biosecurity to Control Disease

• Awareness of Strange Persons/Vehicles
• Restricted Movement Zones - Minimize and Control Farm Traffic
• Management to Prevent Spread of Introduced Pathogens
• Quarantine - Management to Protect Adjacent Herds From Disease
• Disinfection of Personnel and Equipment
Economics of Controlling A Foreign Animal Disease

- Stopping Movement – Animals & Products
- Depopulation of Infected & Adjacent Herds
- Disposal of Carcasses
- Disinfection - premises, personnel, vehicles
- Mass vaccination programs (some cases)
Keys to Communication

• **Reservoir** – human, domestic animal, wild animal
• **Zoonotic** – terrorism = disease without contact with reservoir species
• **Contagious** – Levels of contagiousness
• **FAD** – Foreign Animal Disease
  – Trade as well as health issues
• **Quarantine** – Role of local, state, and federal government (not voluntary)