

Animal Emergency Response

Bio-Agent Lists

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2004 OSC Readiness Training
Program



Bio-Agent Lists

- Office of International Epizootics (OIE)
- Centers for Disease Control and Prevention (CDC)
- U.S. Department of Agriculture (USDA)
- U.S. Environmental Protection Agency (EPA)

Office of International Epizootics

- List A

- Transmissible diseases with the potential for serious and rapid spread, irrespective of national borders, serious socioeconomic or public health consequence, major importance in the international trade of animals and animal products

- List B

- Transmissible diseases that are considered to be of socioeconomic and/or public health importance within countries and which are significant in the international trade of animals and animal products

OIE

- January 2005, OIE plans to replace current A and B Lists with a single list that is more compatible with the SPS (Sanitary and Phytosanitary Agreement) of the World Trade Organization.
 - All diseases will be classified equally
 - Review of criteria for inclusion

Centers for Disease Control and Prevention

- Category A
 - High-priority agents...pose a risk to national security...easily disseminated or transmitted from person to person...result in high mortality...require special action for public health preparedness
- Category B
 - Second highest priority agents...moderately easy to disseminate, result in low morbidity and mortality rates, require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance
- Category C
 - Third highest priority agents....emerging pathogens that could be engineered for mass dissemination in the future

USDA/APHIS Select Agent List

- “biological agents and toxins..., capable of causing: (1) Death, disease, or other biological malfunction...; (2) deterioration of food, water, equipment, supplies, or material of any kind; or (3) deleterious alteration of the environment.”

EPA

- Bacteria: anthrax, plague, tularmia, brucella
- Viruses: smallpox, viral encephalitis, viral hemorrhagic fevers
- Rickettsia: Q fever
- Toxins: Clostridium botulinum, staph. enterotoxin, ricin, mycotoxins

Overlap Agents

- Selected by both USDA/APHIS and DHHS/CDC
- Of concern to both animals and humans
- Zoonotic

Overlap Agents

- Anthrax
- Botulism
- Tularemia
- Brucellosis
- Glanders
- Q Fever
- Viral Encephalitis (EEE, WEE, VEE)
- Rift Valley Fever virus

Bacillus anthracis



Prevention and Control



Bio Weapon

- Sverdlovsk, Russia 1979
- South Africa 1978-80
- 2001 Anthrax letters
 - 22 cases
 - 11 cutaneous
 - 11 inhalation
 - 5 deaths (index case FL, 2 Brentwood postal workers MD, hospital supply worker NYC, elderly woman CT)

Bio Weapon

- CDC estimates:
 - 50 kg spores
 - Urban area 5 million
 - 250,000 cases of anthrax
 - 100,000 deaths

Anthrax

- Decon

- Burn or bury carcasses, bedding, other materials
- Decontaminate soil (5% lye or quicklime)
- Remove organic material and disinfect structures (1:10 bleach)
- Effective disinfection difficult

- Disposal

- Necropsy NOT advised
- Do not open carcass
- Proper burial/cremation to avoid further transmission of spores

Clostridium botulinum



Bio Weapon

- Aum Shinriky cult
- Potent and lethal
- Easily produced, transported
- Point source aerosol release
 - Incapacitate or kill 10% of persons within 0.5 km downwind

Botulism

- Decon

- Food: boiling 10 mins
- Surface: 0.5% bleach

- Disposal

- Substantial inactivation of toxin occurs after 2 days from time of release into air
- Good husbandry
- Rodent and vermin control
- Prompt carcass disposal

Francisella tularensis



Bio Weapon

- WHO estimate
 - 50 kg virulent *F. tularensis* particles aerosolized
 - City of 5 million
 - 250,000 ill
 - 19,000 deaths
 - \$5.4 billion in cost

Tularemia

- Decon

- Bacteria easily inactivated by mild heat (55 deg. F for 10 mins)
- Bacteria easily killed by disinfectants (0.5% bleach)

- Disposal

- Proper carcass/tissue handling (masks, gloves)
- Skinning, necropsy rabbits or other infected mammals
- Thoroughly cook meat
- Vector avoidance (ticks, flies)

Brucella spp.





Bio Weapon

- Aerosolized *B. melitensis*
 - City of 100,000
 - Inhale 1,000 cells (2% decay per minute)
- Results
 - 82,500 cases extended therapy
 - 413 deaths
 - \$477.7 million economic impact

Brucellosis

- Decon

- Easily killed with disinfectants
- 0.5% bleach
- 145 deg. F for 30 mins

- Disposal

- May survive 6 weeks in dust, 10 weeks in soil

Glanders – *Burkholderia mallei*





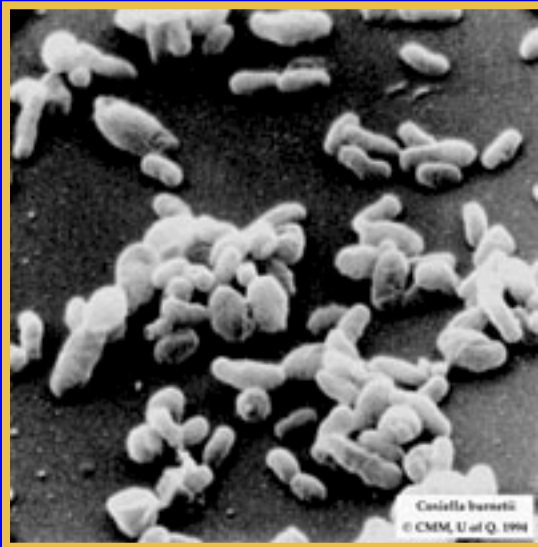
Glanders

- Decon

- UV rays of sunlight kill *B.mallei* in several hrs
- Standard disinfectant on surfaces effective (0.5% bleach)

- Disposal

Q Fever - *Coxiella burnetii*



Prevention and Control

- Pasteurization
- Vaccination
- Eradication not practical
 - Too many reservoirs
 - Constant exposure
 - Stability of agent in environment
- Good husbandry
- Isolate new animals

Bio Weapon

- WHO estimate: 5 kg agent released on 5 million persons
 - 125,000 ill
 - 150 deaths
 - Can travel downwind over 20 km

Q Fever

- Decon

- Surfaces with soap and water
- 0.5% bleach
- 1% lysol
- 5% peroxide

- Disposal

- Bacterial spores resist drying, heat, sunlight
- Disposal of birth products (incinerate)
- Lamb indoors in separate facilities
- Isolate new animals

Viral Encephalitides

- Eastern Equine Encephalitis (EEE)
- Western Equine Encephalitis (WEE)
- Venezuelan Equine Encephalitis (VEE)

Control and Prevention

- Protection from mosquito bites
- Live, attenuated virus for horses
- Formalin-inactivated virus for lab workers at risk

VEE

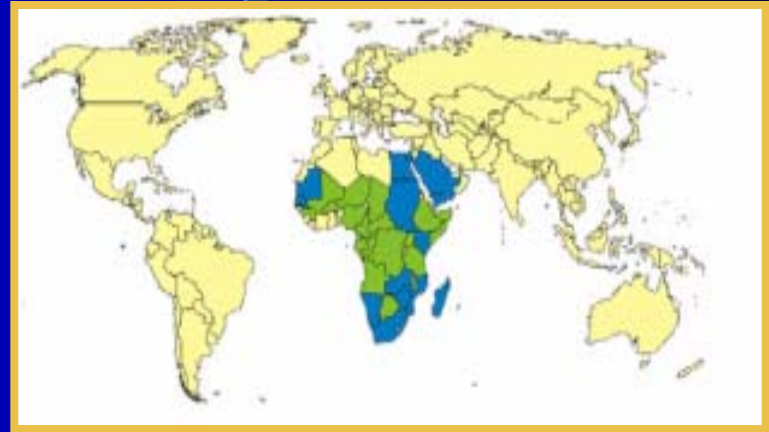
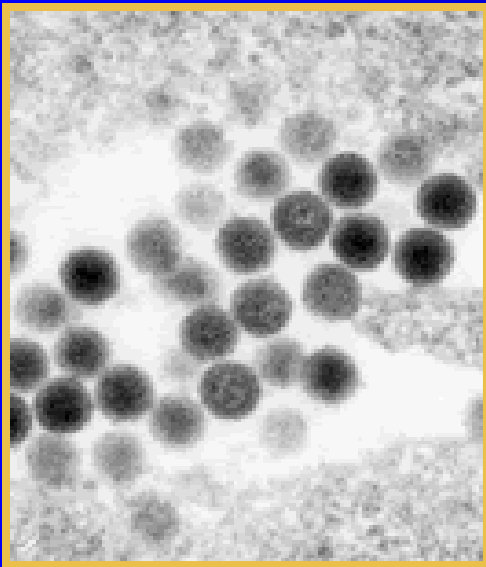
- Decon

- During outbreak, standard biosecurity measures
- Premises/equipment disinfection during outbreak

- Disposal

- Aerial spraying of insecticides
- Quarantine
- Restrict movement

Rift Valley Fever Virus



Animal Disease

Mortality 100%	Severe Illness Abortion Mortality	Severe Illness Viremia Abortion	Infection Viremia	Refractive to Infection
Lambs	Sheep	Monkeys	Horses	Rodents
Calves	Cattle	Camels	Cats	Rabbits
Kids	Goats	Rats	Dogs	Birds
Puppies	Humans	Squirrels	Monkeys	
Kittens				
Some rodents				

Bio Weapon

- Human introduction
- Animals as sentinels
- Aerosol or droplets
 - 1 km downwind
 - 35,000 humans incapacitated
 - 400 deaths

Rift Valley Fever

- Decon

- Prompt reporting!
- State veterinarian
- Federal veterinarian (USDA-APHIS)
- State public health veterinarian

- Disposal

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- State veterinarian
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