Biosecurity: Routes of Disease Transmission

Responders need to have a basic understanding of the ways (or routes of transmission) pathogens can move from animal to animal, as well as location to location. This knowledge will help enact basic preventive measures to prevent the spread of disease.

Zoonotic Disease Transmission

- **Direct contact**
  - Susceptible animal comes in contact with infected animal
  - Body fluids (urine, feces, saliva, blood, milk)
  - Tissues (lesions, carcass, parturition)
  - Breeding; mother-to-offspring

- **Aerosol**
  - Droplets spread through the air
  - Most not stable in droplets
  - Requires close proximity
  - Exposure: enclosed barns, coughing, sneezing, contaminated soil or dust

- **Ingestion**
  - Contaminated food or water
    - Feces, urine, saliva, milk
  - Licking/chewing contaminated environment
  - Shared feed or water sources

- **Fomites**
  - Contaminated inanimate objects
  - E.g., buckets, shovels, vehicles, clothing

- **Vector**
  - Living organism transfers disease between animals, generally insect
  - Mosquitoes, ticks, biting midges, flies

- **Environment**
  - Soil, organic material

Points to Remember

- Animals may not exhibit obvious signs of disease
- Not all pathogens spread by all routes of transmission
- Some pathogens can be persistent in the environment (e.g., soil, manure, water)

Preventing Exposure

- **Isolation/quarantine**
  - Increase distance between sick and well animals

- **Cleaning and disinfection**
  - Keep environment clean, dry
  - Keep feed and water clean
  - Keep equipment clean

- **Minimize aerosol exposure**
  - Adequate ventilation
  - Provide fresh air
  - Decrease humidity
    - Affects droplet formation and persistence
  - Control dust

- **Vector control**
  - Source reduction/habitat elimination
  - Parasitic or predatory insects
  - Insecticides
  - Minimize interaction with insects
    - Sheltering of animals

- **Personal Protective Equipment (PPE)**
  - Gloves
    - Barrier between you and the disease
    - Wash hands after removing gloves
  - Coveralls, boots
  - Mask, goggles
  - Wear masks in certain situations
    - Handling infectious animals or tissues
    - Assisting with calving

Additional Resources

Center for Food Security and Public Health. Infection Control Resources.
http://www.cfsph.iastate.edu/Infection_Control/index.php

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