Veterinary Science
Preparatory Training for the Veterinary Assistant

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Natural, Accidental & Intentional Outbreaks of Disease

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Objectives

- Discuss the potential occurrences of animal disease outbreaks
- Describe endemic, emerging, zoonotic, and foreign animal diseases
Animal-Human-Environmental Health Threatened by Potential Occurrences

- **Endemic animal diseases**
  - Currently present in U.S., not increasing in prevalence

- **Foreign (exotic) animal diseases**
  - Not currently present in U.S.
  - Accidental and intentional risks for entry
    - Travelers, meat products, garbage, bioterrorists

- **Emerging animal diseases**
  - Natural, accidental and intentional risks of emergence
    - A new disease, increasing in prevalence
    - A new form of an old endemic disease, increasing in prevalence
- **Epidemic animal diseases**
  - Outbreak of a disease in regional animal populations

- **Pandemic animal diseases**
  - Outbreak of a disease in world-wide animal populations

- **Zoonotic diseases**
  - Diseases shared by animals and people
Devastating Impacts of Animal Disease Outbreaks

- Economic impacts
- Sociologic impacts
- Emotional impacts
- Political impacts
Foot and Mouth Disease

- Not in U.S.
  - A FAD
  - A reportable disease
  - Not a zoonotic disease
  - A potential bioterrorist agent

- Viral disease
  - Domestic and wild cloven-hoofed livestock
  - Blisters and sores in mouth and on feet

- Transmission
  - Aerosol
  - Direct and close contact
Avian Influenza
(Avian Flu)  (Bird Flu)

- **Viral disease**
  - Migratory waterfowl
  - Domestic poultry
  - Virus in intestines
  - Virus shed in feces

- **Transmission**
  - Aerosol
  - Direct and close contact

- A reportable disease
Two classifications – disease symptoms

- Low-pathogenic avian influenza (LPAI)
  - In U.S.
  - An endemic disease
  - Most common class

- High-pathogenic avian influenza (HPAI)
  - Not in U.S.
  - A FAD
  - An epidemic disease
  - A potential zoonotic disease (rare)
Caused by influenza strain A virus

Over 144 subtypes of type HN

- By combinations of 16 Hs and 9 Ns surface proteins
  - H = Hemagglutinin
  - N = Neuraminidase

- Examples = H1N1, H1N2, H2N2, H5N1, H7N2
Various subtypes of HN
- LPAI
- Bird to bird, not to people
- In U.S.
- An endemic disease

Types H5 and H7
- Mutates from LPAI to HPAI
- A FAD
- A potential zoonotic disease
- A bioterrorist agent

Subtype H5N1 (epidemics)
- HPAI
- Bird to bird, rarely to people
- Asia
Subtype re-assortments and mutations

- DNA of one or more subtypes
  - H1N1 swine + H1N1 bird + H1N1 human
    - H1N1 Human Flu in 2009
- Risks of epidemics and pandemics
- A potential zoonotic disease
- A bioterrorist agent
Bovine Spongiform Encephalopathy (BSE)  
Mad Cow Disease

- Not in U.S.
  - A FAD
  - A reportable disease

- Prion disease
  - Cattle
  - People (vCJD) – zoonotic disease

- Brain disease in cattle – rabies symptoms
Not contagious

Reduced risks of entry and spread

USDA bans
  - Feed bans
  - Slaughter bans
  - Import bans
Cervid Spongiform Encephalopathy
Chronic Wasting Disease (CWD)

- In U.S.
  - An endemic disease
  - A reportable disease
  - Colorado, Wyoming, Nebraska, S. Dakota, Utah, New Mexico, Wisconsin, Illinois, New York, W. Virginia, Montana, Oklahoma, Kansas
Prion disease?
  - Deer and elk

Brain disease – rabies symptoms
  - Chronic emaciation disease

Restricted importation into States

Voluntary CWD Monitoring Program
  - Hunter-Killed Testing Program
Deer with CWD
Elk with CWD
Anthrax

- In U.S.
  - An endemic disease
  - A reportable disease

- Bacterial disease
  - Domestic and wild livestock
  - People – zoonotic disease
West Nile Encephalitis

- In U.S.
  - An endemic disease
  - A reportable disease

- Viral bird disease – >100 species
  - Blue jays, crows, hawks
  - Encephalitis death
Transmission

- Virus in bird blood
- Mosquito (>75 species) bite bird
- Mosquito bite mammal – virus not in blood (dead end)
  - Horse – rabies symptoms
  - People – zoonotic disease
Bovine Tuberculosis

- In US
  - An endemic disease
  - A reportable disease

- Bacterial disease
  - Cattle

- Chronic emaciation, respiratory distress
  - Tumor abscesses of lungs and lymph nodes
Bovine Paratuberculosis
Johne’s Disease

- In U.S.
  - An endemic disease
  - Not a reportable disease

- Bacterial disease
  - Cattle

- Chronic emaciation
  - Maldigestive enteritis – diarrhea