Emerging Diseases

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USDA VS Definition

- Any animal disease or infection not known to exist in the United States, including a new strain of a known disease occurring in any animal species, including wildlife;

- Evidence of a change in the epidemiology of a known animal disease such as increased pathogenicity, expanded host range, or clinical signs that do not fit the classical picture.
Examples

- Porcine Epidemic Diarrhea Virus (Swine Enteric Coronavirus Disease)

Figure 1. Number of Confirmed Positive Premises by Week

Week the sample was received at the laboratory for testing.
Examples

- Seneca Valley Virus
High Path Avian Influenza 2015-2016

- HPAI H5 N1
- 2015
  - 211 commercial
  - 21 back yard
  - 49.7 million birds
- 2014
  - 1 commercial
  - 43 k birds
Diagnostic Center for Population and Animal Health
Diagnostic Center for Population and Animal Health

- Regarded as one of the top 3 animal diagnostic labs in the US
- Part of the NAHLN network
- 800 tests in 11 service sections
- 220,000 cases and 1.5 million tests annually
- Readiness for
  - Foreign Animal Disease – FMD or HPAI
  - New disease
  - Toxicological issues PBB and Lead
- Critical to Teaching and Research
Antimicrobial Resistance
Public Health Threat

http://www.cdc.gov/narmsnow/
Animal Health Threat

Introductions of new multidrug-resistant *Salmonella enterica* strains into commercial dairy herds


*Agro-Food Animal Health Program, Field Disease Investigation, and Disease Management, Department of Veterinary Microbiology and Pathology, School of Veterinary Medicine, The University of Queensland*

An outbreak of multidrug-resistant *Salmonella enterica* Serotype Oranienburg in Michigan dairy calves

John B. Kaneene, RoseAnn Miller, Katherine May, and Joseph A. Hattey

Antimicrobial multidrug resistance and coreistance patterns of *Mannheimia haemolytica* isolated from bovine respiratory disease cases—a three-year (2009–2011) retrospective analysis

Brian V. Lubbers, Gregg A. Hanzlicek
Recommendations To Combat Antibiotic Resistance

- Appropriate Use of Antibiotics in Animal Agriculture
- Effective Global Coordination
- Strong Federal Leadership
- Effective Surveillance and Response
- Improving Stewardship Programs
- Economic Incentives to Develop Antibiotics
- New Antibiotics
- Fundamental Research

Adapted from Dr. Lonnie King
Other Examples in Michigan

- Mycoplasma wenyonii in cattle
- CWD
- bTB in wild white tail deer
- Equine Herpes Virus 1 and 5
- Colony collapse disorder in honey bees
- White nose syndrome in bats
  - *Pseudogymnoascus destructans*
- Foot Rot in sheep
  - *Dichelobacter nodosus*
- Bovine Leukosis Virus
Bovine Leukosis Virus

- Retro virus affecting cattle
- Integrates into DNA of lymphocytes
- Sub-clinical to tumor formation
- In Dairy cows
  - Decreased milk production
  - Impaired immune response
  - Decreased longevity
- 80+% dairy and 20+ beef cow-calf herds affected
RESEARCH ARTICLE

Exposure to Bovine Leukemia Virus Is Associated with Breast Cancer: A Case-Control Study

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Integrated BLV Research and Extension

Transmission
Diagnosis
Pathogenesis
Epidemiology
Control Strategies
Immunology
Economics
Production Affects