Infectious Disease Research and One Health Education Programs

2010 K-State Sustainability Conference
Beth A. Montelone, Ph. D.
BRI at Pat Roberts Hall
BSL-3 and BSL-3Ag research on animal, plant, and zoonotic diseases
• 113,000 sq ft facility
• 41,000 sq ft research & education space
Animal Infectious Disease

Plant Infectious Disease

Basic Pathogen Biology

Food Safety

Administration

Education & Training
BSL-3 Laboratories

Organisms are handled safely in biosafety cabinets

14 Research labs
7 Support labs
Small Animal Vivarium

- Ventilated cages for mice, rats, and other small animals in a racking system

- Animals can be handled in a biosafety cabinet
Large Animal Research Space

• BSL-3Ag
  » Capacity for horses, cattle, swine, goats, etc.
  » 21 compression seal gas tight doors
  » 9 air gasket seal gas tight doors
  » Animal room is the containment vessel
Food Safety Research

- USDA-style animal slaughter and processing floor and associated research space under BSL-3
- Allows deliberate contamination of a carcass for studies
  - Detection
  - Decontamination
BRI Infectious Disease Research Projects

- Food safety research with *Bacillus anthracis* (anthrax vaccine strain) study—underway—Dr. Oberst

- 1st animal study—porcine reproductive and respiratory syndrome virus & porcine circovirus—completed—Drs. Hesse and Rowland
Current and Pending Research

• Wheat blast (Drs. Valent, Bockus, Stack, and Tang)—in progress
• H1N1 and swine influenza in pigs and mice (Dr. Richt)
• Exotic bluetongue, West Nile Virus (ABADRU researchers)
• *Brucella* vaccine trial (Dr. Ficht)
• Rift Valley Fever Virus vaccine trial and diagnostic studies (Dr. Richt and ABADRU)
• Avian influenza (Dr. Richt)
BRI Research and Sustainability

- Research is expensive but dealing with disease outbreaks has a higher $\$\$ and environmental cost
- BRI research outcomes include development of
  - Diagnostic tests for animal, zoonotic, and plant diseases
  - Vaccines and therapies for animal and zoonotic diseases
  - Disease-resistant plant strains
  - Safer food-processing methodologies
  - Educational materials for the biotech workforce
Integration of Research and Education

• K-State’s land-grant mission means bringing basic and applied research to the public through educational programs

• BRI Integrated Training Suite
  » Training for scientists and staff
  » Distance and continuing ed

• One Health Kansas educational programs
One Health Kansas

• Promotes awareness and understanding of the **interconnections among human, animal and environmental health**

• Will help the citizens of Kansas understand related challenges affecting the health of Kansas children and adults

• Developed by K-State in 2008 with funding from the Kansas Health Foundation
ONE HEALTH KANSAS: SPECIFIC AIMS

• Build the pipeline of future public health professionals by extending public health education into K-12 schools, community colleges and undergraduate institutions across Kansas

• Provide broader and more in-depth education for current and future public health professionals to develop workforce capable of addressing emerging and re-emerging zoonotic diseases
One Health Kansas

• The goals of One Health Kansas are aligned with the national One Health Commission and the global One Health Initiative.

• Thus, One Health Kansas promotes collaboration among veterinary, medical, and public health professionals based at institutions of higher education and within communities.
Make a new program sustainable by partnering with established programs having similar or parallel goals

One Health Kansas was designed to work with existing research/education partners at K-State including

- Center for Science Education
- CORES: Collaborative for Outreach, Recruitment and Engagement in STEM
- Division of Continuing Education
- International Food Safety Network
- K-State MPH program
- K-State Olathe Innovation Campus
- K-State Rabies Lab
ONE HEALTH KANSAS Partnerships—at K-State

• K-State faculty expert partners:
  
  » Communication of health issues
    • Dr. Doug Powell
    • Dr. Kate Stenske
  
  » Basic research on zoonotic diseases/transmission
    • Dr. Cathy Hanlon
    • Dr. Deon van der Merwe
    • Dr. Brad White
    • Dr. Samantha Wisely
ONE HEALTH KANSAS Partnerships—elsewhere

• KU Institute for Community and Public Health
• Kansas Health Foundation
• Makere University
• Morris Animal Foundation
• North Dakota State University
• University of Pennsylvania
• USAID
ONE HEALTH KANSAS Partnerships

CC partners

K-State Olathe

CORES

UG PH
• PH 110
• SURPH
• BS/MPH

Director of UG PH

K-State MPH

One Health content

One Health curricular sharing
K-State/KU PH programs

K-State Olathe and DCE

Integration Outreach Leader

K-12 student engagement

K-12 teacher engagement

Community outreach (informed by field research)

One Health continuing/professional ed

K-State MPH

Curriculum Coordinator

Center for Science Ed

External collaborators

K-State faculty experts