BIOSECURITY AND ZOONOTIC DISEASE CHALLENGES AT THE KANSAS STATE FAIR (KSF)

• Capstone Experience

• Objective of my project- Create initial biosecurity recommendations that would provide KSF management guidance for improvements
Brief History of the Kansas State Fair (KSF)

• More than 100 years of fair tradition and history

• A state institution – created by the Kansas legislature

• Multiple uses through the year other than KSF; rodeos, livestock shows, family gatherings, trade shows

Photo courtesy of Kansas State Fair, used with permission
Kansas State Fairgrounds Map

- Hutchinson, Kansas

- The fairgrounds occupies 280 acres of land
Benefits of the KSF to Kansas Agriculture

- Kansas Agriculture is showcased at the KSF
- Educating Kansans where their food comes from
- Human-Animal Bond in animal agriculture
Benefits of KSF to Kansas

• Opportunities for 4-H and FFA (Future Farmers of America) livestock competitions

• Entertainment for all ages of people
Background of Biosecurity at the Fair

• Early biosecurity plans were developed by Kansas Department of Agriculture Division of Animal Health

• KDA officials desired to be proactive in prevention of zoonotic diseases and livestock disease at the Kansas State Fair

• Interest by Kansas State Fair management in improvement of biosecurity
Background of Biosecurity at the Fair

• National background

  - Ogden, Utah, May, 2011, EHM (Equine Herpes Myeloencephalopathy) / EHV-1 outbreak in horses at equine event

  - Swine influenza outbreaks in fairs in other states (Ohio and Indiana) in 2012
MAJOR RESOURCES USED FOR PREPARING INITIAL KSF BIOSECURITY RECOMMENDATIONS

• California Department of Food and Agriculture, Animal Health Branch, Biosecurity Toolkit for Equine Events prepared by Dr. Katie Flynn - 2012

• National Association of State Public Health Veterinarians Committee - Compendium of Measures to Prevent Disease Associated with Animals in Public Settings - 2013

• Kansas Department of Health and Environment - Disease Prevention for Fairs and Festivals Toolkit - 2014
STAKEHOLDERS IN BIOSECURITY AT THE KANSAS STATE FAIR
STAKEHOLDERS IN BIOSECURITY AT THE KANSAS STATE FAIR
Challenges of Biosecurity at the Kansas State Fair

During 10 days of operation in September 2014:

- Mass gathering of 355,000 people
- >2,000 livestock and poultry entries
- Food and Drink - 123 vendors

- Millions of human-animal interactions
- Aging fairground facilities
Challenges of Biosecurity at the Kansas State Fair

• Limited budgets - gate fees, food vendor fees and exhibitor fees provide most of the income

• Negative incidents have high media coverage potential

Animal rights group sues Kansas State Fair over slaughter video
August 27, 2012 | Kevin Murphy | Reuters
Keep the Kansas State Fair Safe for Visitors and Livestock

• An outbreak of zoonotic disease at the KSF among fair visitors would have substantial economic, legal, public health and medical effects

• Priorities:
  – Keep children and adults safe while at the fair
  – Prevent transmission of livestock disease
Biosecurity vs. Fair Experience for Visitors and Exhibitors

Maintaining good biosecurity with risk reduction

Maintaining a positive experience for fair visitors and animal exhibitors
E. coli outbreak linked to Cleveland County Fair now over 100 cases

Gaston child dies of E. coli complications after attending Cleveland County Fair

Toddler dies from E. coli after trip to county fair

North Carolina Mom Sues County Fair After Son Part of E. coli Outbreak

Food Safety News
One Health

Animal Health

Environment

Human Health
Recent Fair Zoonotic Disease Outbreaks

Multiple Pathogens

- Commonly reported disease agents include at fairs:
  - *E. coli* O157:H7
  - *Campylobacter jejuni*
  - *Cryptosporidium* species
  - *Salmonella enterica*- non typhoid
  - Swine origin Influenza A virus--(H1N1v and H3N2v)
Multiple Venues for Transmission of Zoonotic Diseases

- Petting zoo
- Animal Birthing Center
  - operated by KVMA and KSU/CVM
- Livestock and poultry exhibits
People at High Risk for Zoonotic Disease at the KSF

• Children aged < 5 years

• Persons who are mentally impaired

• Immunocompromised persons

• Older persons > age 65
Water systems vulnerable

Washington County Fair (New York State, 1999):

- No municipal water supply
- Water wells:
  - Shallow wells & untreated water
  - Resulted in 928 human cases and 2 deaths from *E. coli* O157:H7 and *Campylobacter jejuni*

Photos used with permission of Tennessee Department of Agriculture
Direct Contact With Animals

Photo courtesy of TN Department of Agriculture; used by permission
Indirect Contact

Photos courtesy of TN Department of Agriculture; used with permission
Common zoonotic pathogens and Enteric Disease

- **Enteric (GI) diseases:**
  - *E. coli* especially *E. coli* O157:H7
  - *Campylobacter jejuni*
  - *Salmonella enterica*-non typhoid
  - *Cryptosporidium* spp.

- Fecal-oral transmission

- Illness and outbreaks of enteric disease are well documented

Photo by Dr. Ingrid Garrison, used by permission
E. Coli O157:H7 is an important human pathogen

- Diarrhea
- Hemorrhagic colitis
- Hemolytic Uremic Syndrome; kidney failure in children and senior citizens (high risk groups)

Photo by CDC/ Peggy S. Hayes
Common zoonotic pathogens observed in fairs

• Respiratory Diseases
• Swine origin Influenza A
• H1N1v virus- common pathogen in outbreaks; but also H3N2v and H1N2v have been isolated
• Transmission usually by direct contact
• Can have bidirectional transmission of influenza viruses between humans and swine

Photo Credit: C. S. Goldsmith and A. Balish, CDC
Behavior of fair visitors that results in increased risk of disease transmission

• Lack of hand washing after animal contact

• Hand-mouth and hand face touching while in the animal exhibits

• Direct contact with livestock (feeding or petting)

Photo from Dr. Ingrid Garrison, used with permission
Risky Behaviors

- Indirect contact with manure
- Eating, drinking or use of infant pacifiers
- Use of strollers which are then taken home

Photo from Tennessee Dept. of Agriculture, reprinted with permission
For Your Safety

DO NOT bring these items into the animal area

Please watch your children

Wash your hands as soon as you exit!

Sorry
No strollers
No food
No bare feet

Thank you

Children must be accompanied by an adult.

Please leave outside corral:
Strollers, Baby Bottles, Pacifiers, and Food/Beverages.

Please refrain from putting your hands in your mouth while in the corral and use hand washing stations after exiting corral.

Thank you.
Biosecurity Recommendations for Reducing Zoonotic Disease at KSF

- Hand hygiene
  - single most important measure to reduce zoonotic disease transmission in fairs
- Soap and water best
- Hand Sanitizer Stations
Recommendations for Reducing Zoonotic Diseases at KSF

- Assure adequate hand hygiene stations

- KSF workers to urge visitors to practice hand hygiene and observe safe behaviors

- Signage in both English and Spanish
Biosecurity Recommendations for Reducing Zoonotic Diseases at KSF

Zoonotic disease education

Photograph courtesy of TN Department of Agriculture, Used with permission.
Biosecurity Recommendations for Reducing Zoonotic Diseases at KSF

• Zoonotic Disease Education

Photo courtesy of TN Dept. of Agric. Used with permission
YOU CAN LEAD A HORSE TO WATER BUT YOU CAN’T MAKE HIM DRINK

YOU CAN PROVIDE EDUCATION ABOUT ZOONOTIC DISEASES AND PROVIDE HAND WASHING FACILITIES AT THE LIVESTOCK EXHIBITS

... BUT YOU CAN NOT MAKE FAIR VISITORS WASH THEIR HANDS!
One Health

Animal Health

Environment

Human Health
Animal to animal disease transmission at the KSF - Major concerns

Lack of isolation facilities for sick animals at the KSF -

Where do we keep the sick livestock?

Photo courtesy of CA Dept. of Food and Agriculture, Equine Medication Monitoring Program; used with permission
Animal to animal disease transmission at the KSF - Major concerns

Where do livestock go after the fair?

- Check-out procedures
- Traceability
- Biosecurity at home
Animal-to-animal disease transmission at the KSF - Major concerns

- Is the KSF prepared for a Foreign Animal Disease Outbreak and a ‘stop movement’ order?
- What if this rare event were to occur during the Kansas State Fair exhibition days?
Biosecurity Recommendations to Kansas State Fair

- Make construction of isolation stalls a priority
- Implement a more robust check out procedure for tracing livestock when they leave the fair
- Educate exhibitors about biosecurity
- Prepare for the rare event of an foreign animal disease outbreak in Kansas
Biosecurity Recommendations to Kansas State Fair

- Biosecurity by exhibitors needs to be improved when they return home from the fair:
- Isolation of animals returning from fair
- Clean and disinfect trailers and trucks
- Washing boots, clothes and equipment used at the fair
Biosecurity Recommendations to Kansas State Fair

• In the unlikely event of a foreign animal disease outbreak such as foot and mouth disease in Kansas, the Animal health Commissioner would issue a ‘stop movement order’ and all livestock movement in Kansas could not move from its location until permitted by animal health officials.
Biosecurity Recommendations to KSF

Foreign Animal Disease Outbreak

- The livestock that are at the fairgrounds at that time of issue would be on the fairgrounds until state or federal animal health officials visited could make the needed inspections and permit healthy animals to return to their home ranch or farm.
Biosecurity Recommendations to KSF

Stop Movement Order

- The KSF would need feed, bedding and personnel to continue holding perhaps several hundred head of livestock until permits could be issued to owners to return home with their livestock. KSF needs to prepare for this unlikely event and work with emergency management personnel for training events.
How Can We Improve Biosecurity?

GOLD LEVEL

SILVER LEVEL

BRONZE LEVEL
Looking to the Future

• An observational study needs to be carried out at the fair to determine how many visitors visit the livestock exhibits, carry out hand hygiene and practice high risk behavior at the KSF

• Hopefully a future MPH student will carry this out
Conclusions

- The KSF offers much to Kansans
- There are zoonotic risks associated with animal contact at the fair
- These risks can be reduced if visitors use good biosecurity measures such as hand hygiene and avoiding certain behaviors
- The comingling of livestock in the fair environment can expose livestock to new diseases
- Being prepared for a disease outbreak at the fair is essential
Thank you

• To God, who gave me the strength and grace to finish this MPH degree

• To my family, for their patience, support and encouragement

• For my MPH graduate committee; Drs. Sanderson, Renberg and Kastner

• For the staff at Kansas Department of Agriculture, Division of Animal Health, especially Dr. Crnic

• To Dr. Ingrid Garrison, State Public Health Veterinarian at Kansas Department of Health and Environment

• For Kansas State University faculty and staff who gave me a chance to learn