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CASE STUDY OF ENTERIC ILLNESS IN RESPONDER ASSOCIATED WITH 2015 HPAI CARCASS DISPOSAL RESPONSE

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Introduction

- Composting SME working with responders on HPAI positive turkey grow out premise carcass disposal developed enteric illness
- PPE used in response may have been inadequate to protect from possible exposure routes
- Other responses involving PPE use have resulted in Occupational exposure to zoonotic pathogens
- Recommend reviewing and updating PPE guidance

Case Patient History

- Case patient, composting SME on HPAI positive turkey grow out premise
- Providing technical input for windrow construction for disposal of turkey carcasses and contaminated bedding/feed
- Case patient PPE: Tyvek coveralls (no hood), nitrile gloves, fitted half face respirator, rubber boots, boot covers and goggles
- Exposed skin on face splashed with infected tissue

Case Patient History

- Exposure may have resulted from possible contamination of hands, eyes, or mucous membranes during doffing of PPE or sweating which could spread contamination to eyes or other mucous membranes
- Patient clinical signs after approx. 12 hours incubation period:
  - abdominal cramping
  - severe diarrhea
  - blood in stool
  - nausea and weakness

Case Patient History

- Patient treated by physician supportive care & antibiotics for dehydration and enteritis
- Tentative diagnosis *Campylobacter* enteritis
  - Diagnostic testing for Campylobacter not available
- Recovery after 10 days and returned to HPAI composting response

Discussion

- Responders to animal disease outbreaks can be exposed to zoonotic pathogens
- Possible routes of exposure to animal disease responders may be similar to plant workers and health care workers
- Preventing exposure of responders to pathogens includes
  - Engineering controls/Infection control program
  - Training/Administrative Controls
  - PPE

Discussion-Enteric Pathogens

- Enteric pathogens
  - *Campylobacter*
    - gram negative bacteria in the genus *Campylobacteriacae*
    - In 2012 FSIS Microbiological baseline data study for raw chicken parts, 21.4% positive for *Campylobacter*
  - *Salmonella*
    - Gram negative bacteria in genus Enterobacteriaceae
    - In 2012 FSIS study, 24% raw poultry parts positive for *Salmonella* spp.
    - Most common cause of foodborne disease

Discussion-*Campylobacter*

- Perio et al, Occupational exposure to *Campylobacter* in Poultry processing plant
- 29 cases of *Campylobacter* reported in workers 2008-2011 primarily in live hang area
- Plant health hazard evaluation
- Plant implemented engineering controls including improved ventilation, sanitation and training in English and Spanish related to hand hygiene and PPE

Discussion-Ebola Virus

- 2013-2015 Ebola outbreak West Africa 23,000 cases with 880 health care workers infected
- Health care workers used Medecins Sans Frontieres (MSF)/CDC PPE: coverall/gown, hood, N95 mask, goggles, double layer gloves, rubber boots, plastic apron
- Some health care workers wearing recommended PPE still exposed and developed Ebola virus infection
- Contamination of skin or mucous membranes during doffing PPE determined to be one route of exposure

Discussion-Ebola Virus

- CDC implemented infection control/engineering controls to prevent exposures including
  - Observer to monitor that all steps of donning and doffing PPE completed correctly
  - Assistant for responder during donning and doffing
  - Designate separate area for donning PPE and doffing PPE
  - Disinfection of gloves and contaminated surfaces during doffing and other control measures

Discussion-SARS

- 2003 SARS outbreak in Hong Kong, 25% of cases occurred in Health care workers
- Mandatory infection control measures in place
  - Training on infection control, PPE, SARS virus transmission
  - PPE: N95 mask, cap, gown, gloves, goggles
- Lau et al case control study to determine risk factors for continued transmission of SARS to health care workers
- Significant risk factors for SARS infection in health care workers
  - Perceived shortage of PPE
  - Less than 2 hours of infection control and PPE training
  - Inconsistent use of PPE

Discussion-Doffing PPE

- Tomas et al studied frequency and location of contamination on skin and clothing during PPE doffing using fluorescent lotion marker
- Contamination occurred in 46% of doffing simulations in health care workers
- Additional training and practice doffing PPE and using fluorescent lotion for visualization of contamination, contamination decreased to 18.9%
- Most common sites of contamination for contaminated gloves: palms of hands, wrists and fingers
- Most common sites of contamination for contaminated gowns: neck, chest and hands

Discussion-Prevention

- Utilize Face shields with goggles and N95 mask or whole face respirators during high risk activities such as movement of animal carcasses, construction of windrows, and turning of windrows where responder could be exposed to splashing. Avoid use of N95 mask if mask can become wet from splashing.
- Clarify that composting SME's role is to provide technical information during compost windrow construction, windrow temperature monitoring and turning and not actively assist with handling carcasses and moving composting materials.

Discussion-Prevention

- Provide responders safety assistant for donning and doffing PPE, water breaks, communication. Safety assistants also wear appropriate PPE.
- Recommend periodic outreach, training and practice sessions for donning and doffing PPE. Use fluorescent lotion during practice.
- Provide running water and soap for hand washing and cleaning skin during the response activities and doffing of PPE. If running water is not available provide disinfecting wipes and hand sanitizer.

Conclusions

- Responders may be exposed to endemic and foreign animal zoonotic diseases during disease outbreaks
- Occupational exposure
  - HPAI disease outbreak response: *Campylobacter*
  - Poultry processing plant: *Campylobacter*
  - Medical Workers: Ebola and SARS
- Limit exposure of responders
  - engineering controls/infection control program
  - PPE training and exercises
  - Assistance donning and doffing PPE

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