Measuring success of disinfection protocols

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Let’s start from the beginning…

- Evaluate current protocols:
  - What is supposed to be getting done
  - What is really going on

- Evaluate your systems needs:
  - Feeder pig movement
  - Wean pig movement
  - Market Loads
    - First cuts, second cuts, dumps
  - Culls
Let’s start from the beginning…

- **Evaluate your current health challenges:**
  - Viral –
    - PRRS, TGE
  - Bacterial –
    - Salmonella, E. coli, APP
  - Parasites-
    - Coccidia

- **Utilize proper disinfectant** -
  - Pathogens present
  - Surface to be disinfected
  - Water quality
  - [http://www.biosecuritycenter.org/](http://www.biosecuritycenter.org/)
  - [www.cfsph.iastate.edu](http://www.cfsph.iastate.edu)
Let’s start from the beginning…

Transport biosecurity breakdown example**:

- Site A (W-F): PRRS ELISA negative before overstocked feeder pigs were moved
- Site B (G-F): received pigs from Site A. PRRS ELISA positive approx. 3 weeks post-placement
- Site C (G-F): received pigs from Site A. PRRS ELISA negative approx. 3 weeks post-placement
- ** Different trucks were used to haul overstocks to both sites
Where to go from here…

- Develop biosecurity plan for all phases of transport
- Work with and educate truckers/producers on cleanliness expectations
- Develop and execute monitoring plans
Monitoring options:

- Dedicate someone to be in charge of monitoring biosecurity
- Four main methods for monitoring:
  - Visual
  - Bacterial Swabs
  - Rapid tests
  - Serology
Visual inspection:

What’s involved:

- Needs to be thorough
- Cab, holding compartments, equipment, trailer, wheels, driver’s boots/coveralls
- Don’t forget to looks above and below and in the corners
Visual inspection:

- Advantages:
  - Quick
  - Good way to assess gross cleanliness
  - Able to directly address issues at that moment
Visual inspection:

- Disadvantages:
  - Subjective
  - Grossly clean does not mean it is properly disinfected and free of pathogens
Bacterial Swabs:

What’s involved:

- Develop standardized sampling method
  - Location and size of sampling area
  - Recommended 1 cfu/ cm^2 of aerobic bacteria as a general target for disinfection
- Sterile swabs
- Culture plates
  - RODAC (Sterile Replicate Organism Detection and Counting plates with D/E Neutralizing Agar; BD Diagnostic Systems, Sparks, Maryland)
- Incubator
Bacterial Swabs:

Advantages:

- Quantitative way to evaluate overall cleaning and disinfection
Bacterial Swabs:

- **Disadvantages:**
  - **Time**
    - Takes at least 48 hours for cultures to grow
  - Only tests for bacteria
  - Only tests for bacteria that can grow on media used
  - Potential for residual disinfectant interference
Rapid tests:

What’s available:

- Lightning test (BioControl Systems, Inc, Bellevue, Washington)
  - Quantifies residual ATP (adenosine triphosphate) found in bacteria, organic debris, feces using a luminometer
- BioClean (BioVet, St. Anthony, Minnesota)
  - Quantifies residual protein on a surface using a color changing reaction
Rapid tests:

## Advantages*:

- **Quick**
  - *Lightning test*: displays a score 11 seconds after surface sample is obtained
  - *BioClean test*: prepared in 1 minute and results within 20 minutes

Rapid tests:

Disadvantages*:

- Costs –
  - initial cost for luminometer with Lightning test
- **Lightning**: residual manure and feed interferes with test accuracy
  - Test may indicate surface is not properly disinfected when it really is
- **BioClean**: residual disinfectant (aldehyde) and low bacterial protein levels interferes with test accuracy
  - Test may indicate a surface is clean when it really is not

Serology:

- Best utilized to monitor viral pathogens, especially PRRS:
  - Blood test pigs at source site:
    - At arrival
    - 1 week prior to overstock movement
  - Blood test pigs at G-F site:
    - 3-4 weeks after placed
    - 1 week prior to 1st market cuts
Serology:

Advantages:

- Objective data to evaluate overall biosecurity
- May be able identify areas of biosecurity breakdown/opportunity
Serology:

# Disadvantages:

- Time
  - Lab turn-around time at least 24 hours after sample arrives
- Limited to certain pathogens (primarily viral)
- Not specific to trailer biosecurity
In Conclusion:

1. Evaluate current protocols –
   - What you expect is getting done and what is really getting done

2. Develop and implement trailer biosecurity protocols for your system:
   - Educate, educate, educate!

3. Develop monitoring strategy:
   - Utilize a variety of the methods available to best suit your system and needs
In Conclusion:

- Thank you!
- Any questions?
References:

4. Center for Food Security and Public Health. ISU