The best serology tests available cannot measure curtain management.

What caused these lung lesions??

Even in pristine environments without environmental and bacterial challenges, gross lesion differences in lungs are subtle. Must rely on diagnostics to confirm!!

Submission for a multisystemic disease investigation

Liver
Colon
Lung
ileum
Heart
Kidney
Spleen

Trends in total cases of PCVAD at ISU

0 200 400 600 800 1000 1200 1400 1600

1993 1995 1997 1999 2001 2003 2005

114 118 114 117 117 117 121
Trends in PCVD diagnosed at ISU VDL

<table>
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<td>8</td>
<td>12</td>
<td>7</td>
<td>16</td>
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<tr>
<td>Total Histopath Cases</td>
<td>5455</td>
<td>6397</td>
<td>6913</td>
<td>5866</td>
<td>5713</td>
<td>6715</td>
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</tbody>
</table>

Severe Systemic Disease (Formerly “PMWS”)

1. Clinical signs: Weight loss, failure to thrive, with or without other signs
2. Histologic lesions: Depletion of lymphoid tissues +/- histiocytic to granulomatous inflammation in any organ
3. PCV2 infection: Preferable via demonstration of PCV2 antigen (IHC) or genome associated with characteristic lesions (ISH)

PCV2 Summary:
Denial → skepticism → stark reality → HOPE
1. PCV2 is ubiquitous: presence is NOT diagnostic for PCVAD
2. PCV2 sometimes causes severe disease (PCVAD)
3. PCVAD is extremely variable in severity in individuals and group, as well as organ system affected
4. Variability is likely do to a number of risk factors, both infectious and non-infectious, as well as variability in virulence of PCV2
5. Diagnosis should include a complete workup, including histopathology and IHC for PCV2 and exams for other agents
6. Improved management, control of concurrent diseases, strategic interventions, and herd immunity do aid in control.
7. Vaccines appear to be efficacious

PRRSV

- Triad of clinical signs when PRRSV is introduced into a naïve sow herd:
  1) Systemic illness in sows
     - usually mild and of short duration (24-48 hours)
  2) Reproductive Disease
     - Typically late gestation (late term abortion, stillborn, weak newborn pigs)
     - In outbreaks, may see reproductive loss at any stage of gestation.
  3) Respiratory/Systemic Disease in all ages (may be clinically severe in nursery pigs)

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SURVEILLANCE OF PRRS AND OR PCV1 USING ORAL FLUID SAMPLING

This document describes the collection and use of oral fluid samples for surveillance of porcine reproductive and respiratory syndrome virus (PRRSV) and porcine circovirus type 2 (PCV2) infections in commercial swine herds. In some production situations, surveillance using oral fluid may offer an alternative to serum samples.

What is “oral fluid?”
Oral fluid is the liquid present in the oral cavity. Oral fluid is a mixture of saliva and “gargle” or “cervical fluid.” Saliva is produced by the salivary glands. Gargle or cervical fluid is a transudate that enters the mouth from the blood stream via the capillaries located at the margins of the teeth and gums.

Why oral fluid samples?
Oral fluids contain both pathogen and antibodies. In humans, oral fluids are used extensively to monitor a variety of infections and acute infectious diseases and conditions. Oral fluids contain both pathogens and antibodies. In humans, oral fluids are used extensively to monitor a variety of infections and acute infectious diseases and conditions. Oral fluids contain both pathogens and antibodies. In humans, oral fluids are used extensively to monitor a variety of infections and acute infectious diseases and conditions. Oral fluids contain both pathogens and antibodies. In humans, oral fluids are used extensively to monitor a variety of infections and acute infectious diseases and conditions. Oral fluids contain both pathogens and antibodies. In humans, oral fluids are used extensively to monitor a variety of infections and acute infectious diseases and conditions.
Control plans must:

- address the financial objectives of the producer
- respect characteristics of the virus that confound traditional control mechanisms
- monitored for success or failure
- be implemented correctly at a high level of detail

**Characteristics of the virus must be considered**

- PRRSV is infectious via multiple routes, IM, IN, orally, and intrauterine.
- PRRSV has a high mutation frequency and recombination is possible.
- Numerous genetic variants have been identified and multiple genetic variants can exist in an individual animal simultaneously.
- Mechanical transmission can occur via contaminated fomites and needles.

**Control circulation within the barn**

**Characteristics of the virus must be considered**

- PRRSV can easily be transferred by indirect contact in cold and wet conditions
- Personnel via coveralls, boots, and hands can transmit PRRSV to naïve pigs following the direct contact with infected pigs.
- Mosquitoes and house flies can be potential mechanical vectors.
- Area spread is frequent.
- Long term success has rarely been reported in pig dense areas without strict biosecurity.

**Control circulation between barns**
Additional characteristics that might be effectively exploited

- It is fairly fragile in the environment and will not survive if exposed to the environment outside a host.
- Persistently infected animals can shed virus to contacts.

**Control circulation between subsequent groups**

Additional characteristics that might be effectively exploited

- Dogs, cats, skunks, raccoons, opossums, rats, mice and fecal samples from house sparrows and starlings have tested negative post inoculation for the virus and these animals are not thought to be vectors.
- Aerosol transmission of PRRSV over long distances is infrequent under field conditions.
- Mosquitoes are not likely to serve as biological or amplifying vectors of PRRSV.

**Prioritize biosecurity and keep it simple**

Resources

- [www.cfsph.iastate.edu/BRM/disinfectants.htm](http://www.cfsph.iastate.edu/BRM/disinfectants.htm)
- [www.biosecuritycenter.org](http://www.biosecuritycenter.org)
- [www.porkboard.org/securityBiosecurity.asp](http://www.porkboard.org/securityBiosecurity.asp)
- [www.omafra.gov.on.ca/english/livestock/swine/health.html](http://www.omafra.gov.on.ca/english/livestock/swine/health.html)
- [http://rodent.swine.unl.edu/](http://rodent.swine.unl.edu/)

Persisting Infection

- Suspected in recurrent breaks and eradication failures
- Wills (2003) documented persistent infection of inoculated pigs as detected by PCR testing up to 251 days
- ELISA responses on these persistently infected pigs can be highly variable.

**Treat sick pigs**

**Remove chronics**

Who wants to spend time here???
Effects of Mycoplasma hyopneumoniae vaccine on pigs naturally infected with M. hyopneumoniae and porcine reproductive and respiratory syndrome virus. Miller GY, Miller CV, Balness PB.

**Accurately diagnose** and **control coinfections**

Age at PRRSv onset was associated with mortality rate, but did not modify vaccine effects. *M. hyopneumoniae* vaccination was effective in promoting growth in spite of concurrent PRRSv infection.

Vaccine. 2004 Jun;22(17-18):2328-33

**Implications:**
1. Pigs will go ELISA-negative, even in the face of homologous re-exposure (esp. on 2XR).
2. SN titers rise slowly, remain elevated.
3. Heterologous exposure will elevate both ELISA and SN titers.
4. Viremia is detectable post re-exposure in all cases.
5. INTERPRET ELISA RESULTS CAUTIOUSLY

“Positive” does not necessarily mean “Protected”

Positive groups need biosecurity too!