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NecropsyFlowchart.pdf
BiosecurityAudit.xls
WaterMedicationWorksheet.xls

Sources of Information on Swine Health
• Diseases of Swine, 9th ed., 2006; Straw, B., et.al.
• American Association of Swine Veterinarians
  – Journal of Swine Health and Production
  – AASV.org website; disease modules
  – Swine Disease Manual, 3rd edition 2004; Schwartz, K
  – Annual meeting proceedings, 2000-08
  – www.AASV.org

Importance of Health to Performance
• Of the primary factors that affect throughput, efficiency, variation and productivity, health is the most important.
• With health challenges:
  – genetic potential will not be expressed
  – the best nutrition formulation or ration will not produce top results
  – the best management will not shine
  – the perfect environment will not allow for great production

Current Health Challenges and Solutions
John Waddell, DVM, MBA
Swine Veterinarian
Sutton Veterinary Clinic, PC
2231 West US Route 6
Sutton, NE 68979
(402) 773-4292
john@suttonvetclinic.com

Health Challenges Outline
• Respiratory challenges
• “Suis-cide” challenges
• Enteric challenges
• Other health challenges
• Solutions for health challenges
Respiratory

- Porcine Respiratory Disease Complex (PRCD)
- Viral agents
  - Porcine Respiratory and Reproductive Syndrome (PRRS virus)
  - Swine Influenza Virus (SIV)
- Mycoplasma hyopneumoniae
- Bacterial agents
  - Pasteurella sp.
  - Actinobacillus pleuropneumonia (App)

Porcine Respiratory Disease Complex (PRDC)

- Just as the name implies...respiratory problems in growing pigs are nearly always a result of multiple bugs and insults
- A “mixed” infection
- Outside of the lab, rarely is respiratory disease the result of a single pathogen!
- Any type of stress can be the first insult that leads to a cascade of events that can end up with disease and death

PRDC

- PRRS, SIV and Mycoplasma act as “door openers”
- Secondary bacteria such as Pasteurella sp. take advantage of the lowered defense mechanisms due to the “door openers”
- The lungs become more susceptible to the secondary invaders after becoming infected with virus or mycoplasma
- Generally, one pathogen intensifies the other

Components of PRDC

- Viral
  - PRRS, SIV, and PCV2
- Bacterial
  - Mycoplasma hyopneumoniae
  - Pasturella multocida
  - Strep. suis
  - Haemophilus parasuis
  - Actinobacillus pleuropneumoniae
  - Actinobacillus suis
  - Salmonella choleraesuis

Clinical Signs

- Fever
- Anorexia
- Lethargy
- Coughing
- Gauntness
- Labored breathing “Thumping”
PRRS Virus

- Remains the number one “co-factor” for swine respiratory disease complex
- Research shows that PRRS virus costs swine producers hundreds of millions of dollars per year
- It has been estimated that 70% of the cost of a PRRS break can be attributed to the post-weaning phase of production

PRRS Virus

- Recent research has demonstrated aerosol transmission of infectious PRRS virus for nearly 3 miles
- Some veterinarians believe we must control the respiratory form of PRRS in the growing pig before we hope to gain area control
- Several production systems are immunizing pigs with the commercial PRRS MLV vaccine for control and reduction of virus in areas of concentrated swine production

PRRS Virus Lung Lesions

High Virulence

Low Virulence

Source: Dr. Pat Halbur, Iowa State University

PRRS Virus

- Many boar studs and recently, some sow sites have installed air filtration equipment to prevent the introduction of aerosolized PRRS virus and other pathogens

Swine Influenza Virus (Flu)

- Flu is a common viral co-factor in PRDC
- Until circa 1998, we dealt exclusively with the “classic swine flu” in pigs, a strain called H1N1
- In the late 90’s, a different strain, H3N2 began infecting swine, particularly sows.
- H1N1 tended to be a seasonal problem in growing pigs causing transient anorexia, fever and coughing
- H3N2 has become more of an endemic virus

“Rope” technology is being developed and tested for PRRS virus monitoring of populations
Swine Flu
- Sow vaccination is common (either pre-farrow or twice a year to the entire herd)
- Autogenous vaccine is also common in attempt to keep up with the drift and changes in the virus
- SIV is an RNA virus (same type as PRRS) which means it changes frequently making it difficult to control with today’s vaccine technology
- Swine flu can be zoonotic so worker vaccination is important

Acute Swine Influenza (SIV)
- High morbidity and low mortality
- Fever: 105 + degrees F
- Off feed and depressed
- Labored abdominal breathing
- Nasal discharge
- Deep barking cough
- Pigs may be unable to rise

They don’t always cough!

Source: Dr. Marie Gramer, University of Minnesota

SIV Clinical Signs
- Depends on age and immune status of the affected pigs
- May vary depending on strain of SIV involved
- Rapid recovery in 3-7 days if infection is uncomplicated

Swine Influenza Virus Infection Timeline

Swine Influenza (SIV) Typical Lung Lesions

Source: Dr. Mike Senn
Maternal Antibody “Passive Immunity”

- Passive antibody from the sow is generally protective
- Can last up to 8-12 weeks of age
- Passive immunity decay explains SIV-induced disease is most common in pigs older than 12 weeks of age

Mycoplasma

- Mycoplasma hyopneumoniae is nearly ubiquitous in pig populations in the U.S.
- While elimination attempts are usually successful in sow populations, re-infection of the pigs in swine-dense areas make vaccination a necessary part of most commercial herds
- Mycoplasma spreads among the populations of growing pigs acting as a “door opener” for secondary bacteria

Mycoplasma Pathogenesis

- Incubation period: 10 - 16 days
- Considerable variability in duration
- Onset of disease dependent on intensity of infection (exposure rate)
- Disease is not evident in most pigs until 3-6 months of age
- Vaccines are effective at reducing severity of lesions, clinical signs, and affect on performance but do not prevent infection

Mycoplasma Clinical Signs

- Described as a chronic disease with
  - High morbidity (high infection rate)
  - Low mortality (low death rate)
- Chronic, non-productive cough
- Fever, usually low grade
- Gradual onset
- Normal breathing unless severe lung damage or secondarily infected

Mycoplasma Lung Lesions

Secondary Bacterial Infections

- Pasteurella, Actinobacillus, Haemophilus, Streptococcus, and Bordetella sps. are often resident in the population
- We have been blessed with some awesome new tools for treatment of bacterial pneumonia but...
- Early identification of sick pigs and treatment is the key to treatment success!
“Suis-cide” Challenges

- Streptococcus suis (Strep suis)
- Hemophilous parasuis (Polyserositis or “Glasser’s Disease”)
- Actinobacillus suis (A. suis)
- These bugs are present in nearly every population
- Improving management/ reducing environmental stressors are the key to control

“Suis-cide” Challenges

- All these bugs can cause “sudden” deaths
- Often mortality and morbidity are higher in “start-up” or repopulated herds.
- Strep suis: CNS, arthritis, or respiratory forms
- H. parasuis: polyserositis
- A. suis: respiratory, skin lesions, arthritis

Endocarditis

Polyserositis/pericarditis

Enteric (gut) Challenges

- Neonatal challenges
  - E.coli (K88, F18, 987P)
  - Clostridium perfringes type A and C. difficile
  - Coccidiosis
  - Viral (rotavirus, TGE)
- Nursery phase challenges
  - E.coli, Salmonella sp., ileitis, PCS, Viral
- Finishing phase challenges
  - HBS, Ileitis, Salmonella sp., Brachyspira, PCV2
Ileitis

- *Lawsonia intracellularis*
- Confirmed in 1993
- Replicates within cytoplasm of epithelial cells of the ileum

Ileitis Clinical Signs

- Clinical signs of acute ileitis can vary from a mild, non-hemorrhagic diarrhea to severe, hemorrhagic, watery diarrhea with rapid onset
- Pigs chronically affected display looseness sometimes tinged with blood along with loss of body condition and fail to thrive
- Subclinical form of ileitis has also been identified which affects growth performance

Lesions of ileitis are variable

Source: Dr. Connie Gebhart, University of Minnesota

Where is the ileum?

Solutions for Ileitis

- We have several effective antimicrobials approved for ileitis and when pulse-dosed at critical periods are very effective in control of ileitis
- We also have an approved and effective avirulent live vaccine that can be used to orally vaccinate for ileitis
- Timing and implementation are paramount regardless of the approach you take
Porcine Circovirus Associated Disease (PCVAD)

- First identified and diagnosed in Canada in mid 1990’s as PMWS (Post-weaning Multi-systemic Wasting Syndrome).
- Became a serious health problem with high mortalities in nursery pigs in UK and Europe in 2001 and beyond. Called PCVD in Europe.
- Substantial losses across U.S. industry.
- Initially called PMWS and associated with PDNS.

PCVAD

- “Race for a cure” yielded three commercially available and efficacious vaccines.
- Vaccine has proven itself beyond doubt.
- New discoveries regarding this agent continue.
- Subclinical cases are now the focus as it has been found that vaccine in the absence of typical clinical PCVAD, has led to improved ADG and reduction in the number of light pigs at market time.

PCVAD can be subclinical or include one or more of the following clinical manifestations:

- Multi-systemic disease with weight loss (formerly known as PMWS).
- High mortality: Doubling of historical mortality rate without introduction of a new known additional pathogen.
- Respiratory signs including pneumonia.
- Porcine Dermatitis and Nephropathy Syndrome (PDNS).
- Enteric signs including diarrhea and weight loss.

PCV2 associated diarrhea is often seen in the group prior to PCV2-associated PMWS.
Porcine Dermatosis/Nephropathy Syndrome (PDNS)

Skin Discoloration

Enlarged, discolored Kidneys

Non-Infectious Challenges

- Hemorrhagic Bowel Syndrome (HBS)
- Gastric Ulcers
- Cannibalism
- Hernias
- Kyphosis/Lordosis (hump-back)
HBS / Torsion
- Cause is unknown
- Risk Factors
  - Feed interruption
  - Rapid ingestion of large amounts of feed / water
  - “Binge” eating
  - Overcrowding
  - Limited feeder space
  - Genetic susceptibility

Gastric Ulcers
- Risk Factors
  - Stress
    - Crowding
    - Fasting
    - Mixing
    - Ventilation
    - Finely ground feed
  - Intermittent Feeding
    - Delivery / ordering
    - Disease
  ANY INTERRUPTION IN FEED INTAKE !!!!

Cannibalism
- Primarily “tail biting”
- “Vices” such as tail and ear biting are generally a result of stressors which make the pigs uncomfortable and restless
- Uniform tail length and pig comfort are essential in addressing these problems

Kyphosis/Lordosis

Solutions for Health Challenges
- Treatment
- Prevention
- Elimination

First, Know Thy Enemy!
- Diagnose! Find out what pathogens are in the population!
- Attempt to sort the wheat from the chaff!
  - Which pathogens are primary? Secondary? Incidental?
  - What stressors could be allowing expression?
Diagnose!

- Clinical signs
  - Respiratory, enteric, lameness, CNS, ADR?
- History
- Morbidity/Mortality
- Response to therapy?
- Fever?
- Laboratory confirmation

After the diagnosis

- Estimate the prevalence of the disease.
- Estimate the cost of the disease in mortality, performance and profit
- Determine if there is an effective treatment or immunization tool available
- Calculate a cost:benefit ratio
- Implement the tool
- Assess response

Treat

- One the diagnosis has been reached and the decision to treat is made:
- Use the right tool at the right animal at right time, in the right dose in the right route and in the right frequency
- Choosing the correct therapeutic tool is only a fraction of the process
- Implementation of the treatment plan is critical!

Prevent

- Choices abound for preventative options:
  - Feedback
  - Planned exposure
  - Avirulent live, attenuated vaccines
  - Bacterins or killed virus vaccines
  - Autogenous vaccines
  - Prophylactic use of therapeutics
- As with other tools, proper implementation is essential to success

If you can’t live with it...

- Eliminate it!
- Multiple options exist
  - Depopulation/repopulation
  - Age segregated rearing
  - Medicated early weaning
  - Test and remove
  - Mass vaccination and unidirectional pig flow
  - Load/immunize/close

In the end...

- It is always best to keep disease out!
- Biosecurity should be first on the list
- We now have the knowledge to implement herd biosecurity that really works
- The days of the snake oil salesman are over!
Current Health Challenges and Solutions

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john@suttonvetclinic.com