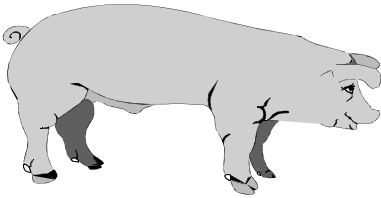
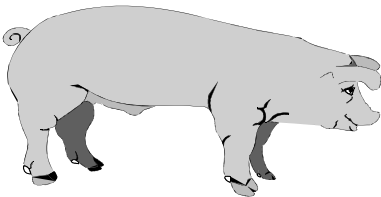


Swine Production



ASC 408G – Spring, 2008

SWINE DISEASES



Swine Diseases

- General Catastrophic
- Respiratory
- Diarrhea
- Arthritic
- Systemic
- Reproductive
- Other

Respiratory

- **Mycoplasma pneumonia**
- **Hemophilus pneumonia**
- **Enzootic pneumonia**
- **Atrophic rhinitis**
- **Influenza**
- **Porcine reproductive and respiratory syndrome (PRRS)**

Respiratory – Mycoplasma pneumonia

- **Isolated in 1965**
- **Once called ‘virus pig pneumonia’**
- **Induces chronic pneumonia in pigs in the United States and throughout the world**
- **Causative agent is *mycoplasma hyopneumoniae***
- **Associated with respiratory disease and reduced productivity**

Respiratory – Mycoplasma pneumonia

- **Epidemiology**
 - **The most common source of infection is carrier swine**
 - **Pen mates**
 - **Sow to pig exposure**

Respiratory – Mycoplasma pneumonia

- **Epidemiology**
 - **Widespread in the United States**
 - Over 50% of herds
 - **Elimination is difficult**
 - Eradication programs depopulate farm for 2-week period during which no animals under 10 months of age are allowed
 - Re-infection is common, if even eliminated

Respiratory – Mycoplasma pneumonia

- **Clinical Signs**
 - **Dry, non-productive cough (variable)**
 - Lasts weeks to months
 - **Fever, decreased appetite, labored breathing**
 - **Unthrifty**

Respiratory – Mycoplasma pneumonia

- **Diagnosis**
 - **Severe lung lesions are present**
 - **Lesions are associated are not specific for mycoplasma pneumonia**
 - **Isolation of organism is difficult**
 - **ELISA assays used to detect serum antibodies to mycoplasma pneumonia**

Respiratory – Mycoplasma pneumonia

• **Treatment**

- **Antibiotics help control the disease, but do not eliminate the organism or heal existing lesions**

Respiratory – Mycoplasma pneumonia

• **Prevention and Control**

- **Provide an optimal environment**
 - **Adequate quality of air, ventilation, ambient temperature, and appropriate pigs in available space**
 - **Populate with SPF stock or high health animals free of organism**
 - **Keep a closed herd**

Respiratory – Mycoplasma pneumonia

• **Prevention and Control**

- **Provide an optimal environment**
 - **SEW**
 - **AIAO**
 - **Good management**
 - **Parasite control**
 - **Antibiotics**

Respiratory – Mycoplasma pneumonia

- **Prevention and Control**
 - **Vaccination Program**
 - Only controls clinical disease associated with mycoplasma pneumonia (ex. coughing)
 - 85% of herd in the United States vaccinate

Respiratory – Hemophilus pneumonia

- Isolated in 1961
- Also called 'actinobacillus pneumonia'
- Induces chronic pneumonia in pigs in the United States and throughout the world
- Causative agent is *actinobacillus pleuropneumoniae*
- Associated with respiratory disease and reduced productivity-similar to MP, but more deadly

Respiratory – Hemophilus pneumonia

- **Epidemiology**
 - The most common source of infection is carrier swine
 - Direct contact from pig to pig
 - Sow to nursing pig
 - Possible role of aerosols and air movement

Respiratory – Hemophilus pneumonia

• Clinical Signs

- Very high fever
- Periods of diarrhea and vomiting
- Cardiac and circulatory failure
 - Nose, ears, leg and whole body become cyanotic
- Foamy, blood-tinged discharge through the mouth and nostrils

Respiratory – Hemophilus pneumonia

• Diagnosis

- Severe lung lesions are present
- Lesions are associated are not specific for hemophilus pneumonia
- Abscesses associated with pleurisy and pericarditis
- Bacterial confirmation

Respiratory – Hemophilus pneumonia

• Treatment

- Antibiotics help control the disease, but do not eliminate the organism or heal existing lesions
 - Antibiotic therapy is effective in the initial phases of the disease
 - Naxcel – injectable cephalosporin

Respiratory – Hemophilus pneumonia

• Prevention and Control

- **Provide an optimal environment**
 - **Adequate quality of air, ventilation, ambient temperature, and appropriate pigs in available space**
 - **Populate with SPF stock or high health animals free of organism**
 - **Keep a closed herd**

Respiratory – Hemophilus pneumonia

• Prevention and Control

- **Provide an optimal environment**
 - **SEW**
 - **AIAO**
 - **Good management**
 - **Parasite control**
 - **Antibiotics**

Respiratory – Hemophilus pneumonia

• Prevention and Control

- **Vaccination Program**
 - **Only partially effective**
 - **Depopulation**
 - **Blood lines**
 - **Economics**

Respiratory – Enzoitic pneumonia

- Most common type of pneumonia on hog farms.
- Most common term used because it describes the pattern of the disease in combination with various invaders.
- Enzoitic pneumonia is characterized by infection with *mycoplasma hyopneumoniae* and other pathogenic bacteria
 - *Pasteurella multocida, streptococcus suis, haemophilus parasuis, actinobacillus pleuropneumoniae – PRRS and circovirus 2*

Respiratory – Enzoitic pneumonia

- Associated with respiratory disease and reduced productivity
- Epidemiology
 - The most common source of infection is carrier swine
 - Direct contact from pig to pig
 - Young pigs get from older pigs

Respiratory – Enzoitic pneumonia

- Clinical Signs
 - Coughing for 30 days after moving to grow-finish building
- Similar to others
 - Diagnosis
 - Treatment
 - Prevention and control (AIAO in grow-finish helps break the cycle)
 - Vaccination

Respiratory – Swine Influenza

- **Virus confirmed in 1931**
- **Causative agents are influenza type A viruses (subtype and genotype species)**
- **Animals usually develop a high immunity**

Respiratory – Swine Influenza

- **Epidemiology**
 - **Outbreaks occur in late fall or winter, often in association with cooler temperatures**
 - **Circulate year round**
 - **Pig to pig contact**
 - **Virus shed through nasal secretions**

Respiratory – Swine Influenza

- **Clinical Signs**
 - **Herd disease due to rapid spread of virus**
 - **Disease onset is sudden and lasts 2-3 days**
 - **Fever, anorexia, inactivity, huddling, reluctance to rise, open mouth breathing, sneezing, coughing and nasal discharge**

Respiratory – Swine Influenza

- **Diagnosis**
 - **Clinical diagnosis is presumptive because must be differentiated from other respiratory diseases**
 - **Isolation of virus (swabbing of nasal passages)**
 - **Detection of viral proteins or nucleic acid**
 - **Virus specific antibodies**

Respiratory – Swine Influenza

- **Treatment, Prevention and Control**
 - **Vaccination and biosecurity are the primary means of preventing SI in pigs**
 - **SIV vaccine strain differs between continents**
 - **Similar to other respiratory diseases**

Respiratory – PRRS

- **The ‘mystery swine disease’ or ‘blue-eared pig disease’**
- **Catastrophic outbreaks of an unrecognized disease in 1980’s**
 - **Reproductive loss**
 - **Post-weaning pneumonia**
 - **Reduced growth performance**
 - **Increased mortality**

Respiratory – PRRS

- **Epidemiology**
 - Originated in Europe
 - Rapidly spread throughout world
 - Entered domestic swine population from an associated wildlife species
 - Virus is shed in saliva, nasal secretion, urine, semen, feces and mammary secretions
 - Transmission via intranasal, intramuscular, intrauterine and vaginal

Respiratory – PRRS

- **Clinical Signs**
 - Varies greatly among herds
 - Sows
 - Loss of litters as abortions
 - Incoordination
 - Nervous signs
 - Weak, mummified, fresh stillborn, dead pigs at birth

Respiratory – PRRS

- **Clinical Signs**
 - Boars
 - Anorexia
 - Respiratory clinical signs
 - Lack libido
 - Reduction in semen quality
 - Semen shedding

Respiratory – PRRS

- **Clinical Signs**
 - **Suckling pigs**
 - **High pre-weaning mortality**
 - **Splay-legged**
 - **Tremors and paddling**
 - **Watery diarrhea**

Respiratory – PRRS

- **Clinical Signs**
 - **Weanling, Grower, Finishing**
 - **Anorexia**
 - **Rough hair coats**
 - **Reduced ADG**
 - **Elevated mortality**
 - **Sneezing and rapid breathing**
 - **Blue discoloration**

Respiratory – PRRS

- **Diagnosis**
 - **Based on a variety of information**
 - **History**
 - **Clinical signs**
 - **Lesions**
 - **Herd production records**
 - **Detection of virus**
 - **Serology**

Respiratory – PRRS

- **Treatment, Prevention and Control**
 - **Stop introduction into negative herds**
 - **Stop introduction of new stains**
 - **Blood test all incoming animals which should be negative**
 - **Isolate for 60 days**
 - **Re-test**

Respiratory – PRRS

- **Treatment, Prevention and Control**
 - **No specific treatment, so control effects of virus at various stages of production**
 - **Management of gilt pool (negative or contact exposure)**
 - **Vaccines are available to develop protective immunity and consistency**
 - **Vaccinate at one time**

Diarrhea

- **Transmissible gastroenteritis (TGE)**
- **Rotaviral diarrhea**
- **Colibacillosis (*E. coli* scours)**
- **Clostridial diarrhea**
- **Swine dysentery (bloody scours)**
- **Ileitis (porcine proliferative enteritis)**
- **Salmonellosis**
- **Coccidiosis**

Diarrhea – Rotaviral Diarrhea

- Rotaviruses cause diarrheal disease in neonates and the young
- Rota means wheel like
- Cause of gastroenteritis in suckling and post-weaning pigs
- Detected in most swine producing countries

Diarrhea – Rotaviral Diarrhea

- Epidemiology
 - Ubiquitous in the environment and in swine herds.
 - It is difficult to raise pigs free of rotaviruses under normal husbandry conditions
 - Multiple serotypes
 - Shed in feces and major route of transmission is fecal-oral

Diarrhea – Rotaviral Diarrhea

- Clinical signs
 - Watery, yellow to white diarrhea
 - Listless, anorexic, vomit within 12-24 hrs after inoculation

Diarrhea – Rotaviral Diarrhea

- **Diagnosis**
 - Lesions in the small intestine
 - Detection of virus, viral antigen, or viral nucleic acids
- **Methods**
 - Electron microscopy
 - Immunohistochemistry
 - ELISA
 - Dot blot hybridization, etc.

Diarrhea – Rotaviral Diarrhea

- **Treatment, Prevention and Control**
 - Antibiotics, anti-secretory drugs and fluid electrolyte therapy
 - No specific treatment
 - Optimal ambient temperature
 - High energy weaner diet
 - Clean environment

Diarrhea – Colibacillosis

- Also called 'baby pig scours'
- Usually affects nursing pigs
- **Cause**
 - *E. coli* strains (K-88, K-99, 987P, F41)
 - Attach to intestine where they colonize and proliferate – this causes gut damage

Diarrhea – Colibacillosis

• Epidemiology

- Sporadic, uncommon outbreaks during nursing phase or 2 weeks post-weaning
- High case fatality rate

Diarrhea – Colibacillosis

• Clinical signs

- Depression
- Head pressing
- Difficulty standing
- Swaying hind end
- Knuckle over on front end
- Tremor and paddling
- White – yellow foul smelling diarrhea

Diarrhea – Colibacillosis

• Treatment, Prevention and Control

- Good sanitation and dry environment
- AIAO farrowing
- Apralan – prevention (feed 2 wks post-weaning_
- Oral challenge gestating sow with manure from previous farrowing room 3-4 weeks before farrowing (passive and lactogenic immunity)
- Vaccinations are available

Diarrhea – Clostridial Diarrhea

- Less common than colibacillosis
- Cause is *clostridium perfringens*
- Occurs in all swine producing areas of the world

Diarrhea – Clostridial Diarrhea

- Epidemiology
 - Type C is the primary pathogen
 - Transmitted from piglet to piglet, but the source is likely the intestine of the sow
 - Highly resistant to heat, disinfectants and UV light
 - Most common in 3 day old pigs

Diarrhea – Clostridial Diarrhea

- Clinical signs
 - Hemorrhagic, thin, watery diarrhea
 - Diarrhea may become bloody
 - 1 day to 2 week old pigs
 - Piglets become weak, rectal temperatures fall and abdominal skin may blacken before death

Diarrhea – Clostridial Diarrhea

- **Diagnosis**
 - **Death usually occurs within 1-2 days after clinical signs, but die shortly thereafter**
 - **Microscopic lesions**
 - **Detection of toxins**

Diarrhea – Clostridial Diarrhea

- **Treatment, Prevention and Control**
 - **Vaccinate sows**
 - **Use antibiotics in feed before and after farrowing in problem herds**
 - **Bacitracin MD**

Diarrhea – Swine Dysentery

- **Mucohemorrhagic colitis affecting pigs primarily during the grow finish period**
 - **Most commonly observed when feeder pigs from several sources are mixed**
- **Also called ‘bloody scours’**
- **Causative agent is *serpulina hyodysenteriae***
- **Concern over reduced susceptibility to a number of antimicrobial agents**

Diarrhea – Swine Dysentery

- **Epidemiology**

- **Worldwide distribution**
- **Transmission of infection occurs due to ingestion of fecal material that originates from affected pigs**
- **Other animals are reservoirs**

Diarrhea – Swine Dysentery

- **Clinical signs**

- **Diarrhea**
- **Some animals may die after a period of a few hours with little or no evidence of diarrhea**
- **Soft, yellow to gray feces**
- **Anorexia**
- **Increased temperature**
- **Mucus and blood found in feces**
- **Depressed growth rate**

Diarrhea – Swine Dysentery

- **Diagnosis**

- **Lesions on large intestine**
- **Emaciated**
- **Rough hair coat with fecal staining**
- **Dehydration**
- **Edema in large intestine**

Diarrhea – Swine Dysentery

- Treatment, Prevention and Control
 - Therapeutic levels of antibiotics
 - Denagard, Lincomix, Mecadox
 - Dosage
 - Duration
 - Route of administration
 - Side effects

Diarrhea – Swine Dysentery

- Treatment, Prevention and Control
 - Vaccination Programs
 - Vaccinations has not played a major role in the control of SD because of the limited efficacy and availability of vaccines
 - Total depopulation

Diarrhea – Ileitis

- Ileitis – Porcine Proliferative Enteritis (PPE)
- Group of acute and chronic conditions of widely different clinical signs
- Necropsy – thickening of the mucosa of the small intestine and colon
- Cause : *Campylobacter*, *Lawsonia intracellularis*, and other intracellular bacteria

Diarrhea – Ileitis

- **Epidemiology**
 - World wide distribution
 - All management systems
 - Occurs rarely in breeding stock
 - Affects growing and finishing pigs
 - Very stable outside of the pig

Diarrhea – Ileitis

- **Clinical signs**
 - Similar to dysentery
 - Some degree of anorexia
 - Curiosity of food
 - Diarrhea
 - Loose, sloppy to watery stools of green-gray color

Diarrhea – Ileitis

- **Diagnosis**
 - Lesions in ileum – some extend to jejunum and cecum
 - PCR of *L. intracellularis* in feces
 - Extract bacteria from intestine and run immunofluorescence assay or immunoperoxidase assay

Diarrhea – Ileitis

- Treatment, Prevention and Control
 - Antimicrobial drugs are mostly ineffective
 - Whole herd treatment
 - Tylan (antibiotic) delivered in feed or water for 2 weeks
 - Whole herd prevention and control
 - Therapeutic antibiotics
 - Vaccination

Diarrhea – Salmonella

- Very successful as pathogens because of their ability to infect a large range of hosts
- Isolated in 1969
- Causative agent : *S. choleraesuis* and *S. typhimurium*
- Severe diarrhea

Diarrhea – Salmonella

- Epidemiology
 - Reservoir is intestinal tract
 - Efficient shedding, persistence in the environment, effective use of transmission vectors
 - Salmonella infection in pork carcasses
 - Infections that cause salmonella in swine

Diarrhea – Salmonella

• **Clinical signs**

- **Pneumonia, hepatitis, chronic wasting, rectal stricture, lethargic, high fever, moist cough**

Diarrhea – Salmonella

• **Diagnosis**

- **Bacterial isolation and identification**
- **Serology in the form of ELISA**
- **Gross lesions**

Diarrhea – Salmonella

• **Treatment, Prevention and Control**

- **Antimicrobial therapy**
- **Routine husbandry procedures**
 - **Remove sick animals**
 - **Pen sanitation**
 - **Cleaning water bowls**
 - **Limit movement of personnel and pigs**

Diarrhea – Coccidiosis

- **Coccidia are intracellular protozoan parasites**
- **Clinical signs (7-11 days of age)**
 - **Yellowish to grayish diarrhea**
 - **Loose and pasty feces**
 - **Pigs become covered in liquid feces, causing them to stay damp and have a rancid smell of sour milk**
 - **Pigs continue nursing, rough hair coat, depressed weight gains**

Diarrhea – Coccidiosis

- **Diagnosis**
 - **Fecal**
 - **Smears**
 - **Floats**
 - **Intestinal**
 - **Mucosal smears**
 - **Histological**
 - **Antibiotic treatment usually not successful in pigs 7-14 days**

Diarrhea – Coccidiosis

- **Treatment**
 - **Antibiotic treatment usually not successful in pigs 7-14 days**
 - **Sows are not a major source of infection**
 - **Antiprotozoal (not available in US)**
 - **Anticoccidial drugs (drinking water)**

Arthritic

- Erysipelas
- Bacterial arthritis
- Mycoplasmal arthritis
