Farrow to Finish Overview

Healthy pigs start with a healthy sow

- Select good maternal line genetics for your farm design.
    - Litter size
    - Milkability
    - Leg structure and survivability
- Careful attention to nutrition
    - Communicate with your nutritionist
    - Mycotoxin and feed particle size testing
- Parasite and disease control
    - Vaccination decisions should be made on a case by case basis by the producers and their veterinarian
        - Risk of infection
        - Efficacy
        - Cost/benefit analysis
        - Public health
    - General recommendation for all producers
        - A combination leptospirosis/Parvovirus/erysipelas vaccine should be given at 5 and 2 weeks pre-breeding for incoming breeding animals and should be given to all sows at weaning and to boars twice annually.
            - Leptosprirosis (lepto) is a disease which can cause abortions
            - Erysipelas: may cause enlarged joints, lameness, heart disease, skin lesions, high fever, and sudden death
            - Parvovirus (PPV) causes reproductive failure, mummified fetuses, return to estrus, small litters, and abortions.
        - A combination Clostridium perfringens type C and E.coli given at 2 and 5 weeks prefarrow for gilts and at 2 weeks prefarrow for sows.
            - Reduces the risk of piglet scours in the farrowing pen/hut.

Piglets have three basic requirements

- A good environment
- Adequate and regular nutrition
- Safety from disease and crushing
    - General recommendation for all producers
        - Iron injections 200mg
            - Reduced anemia in piglets
        - Ileitis Vaccination
            - 1 dose product given between 10days of age and 3 weeks of age.

        - Combination Circo Myco vaccination.
            - Administer at 3 and 6 weeks of age.
        - Erysipelas
            - Administer at 6 weeks of age
    - Vaccinate for the following diseases depending on disease prevalence in your area or issues seen on your farm.
        - Actinobacillus Pleuropneumoniae (APP)
        - Encephalomyocardidit virus (EMC)
        - Haemonphilus parasuis (HPS)
        - Mycoplasma hyporhinis
        - Porcine reproductive and respiratory syndrome (PRRSV)
        - Rotavirus
        - Salmonella
        - Strep suis
        - Swine dysentery
        - Influenza virus
        - Transmissible gastroenteritis (TGE)

When should you contact your vet

- 1% death loss in a week or 3% death loss in a month
- Cough or scours noted with 15% or more of the group
- If any of these signs are seen
    - Abortions
    - Vomiting
    - Abnormal skin lesions
    - Bloody scours
    - Neurologic issues

African Swine Fever

African Swine fever is a serious, highly contagious, viral disease of pigs. It can spread rapidly in pig populations by direct or indirect contact or by infected ticks. It can persist in uncooked pig products or feed shipments, facilitating its introduction into new areas. ASFV can cause 100% mortality to almost subclinical signs depending on the strain.

ASFV affects members of the pig family (suidae). This includes all domestic and feral pigs. **There is no evidence that ASFV infects humans.** Currently no vaccine is available.

Transmission

- With or without tick vectors
- Aerosolized and entering upper respiratory tract
- Direct contact
- Eating uncooked blood, meat, or tissues from infected animals (>140 days in bone meal, blood, and hams/frozen carcasses)
- Tail biting and/or fighting with an infected animal
- Fecal or urine contact (3 days at 98 degrees F, 15 days at 39 degrees F)
    - Fecal contamination of grain shipments is highly possible (original PEDv outbreaks in the US)

Disinfection

Many common disinfectants are ineffective against ASFV

- Sodium hypochlorite, citric acid (1%)
- Some iodine and quaternary ammonium compounds

Unprocessed meat must be heated to < 158 degrees F for 30 mins to inactivate ASFV.

Incubation Period

The incubation period is 5 to 21 days after direct contact with infected pigs.

Clinical Signs:

- ASFV can be a peracute, subacute, or chronic disease
    - Sometimes making it hard to diagnose
- Sudden deaths with few lesions (peracute cases) may be the first signs in a herd.
- Acute cases: high fever, off-feed, lethargy, weakness, and recumbency. Erythema (reddening or blackening or the skin) especially on ears, tail, and across body. Respiratory signs and abortions have been seen.

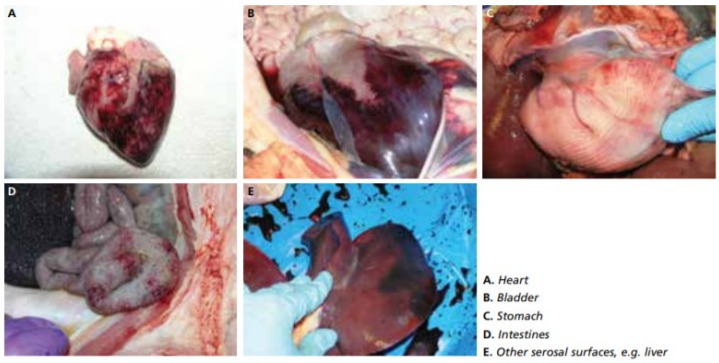
Clinical signs of acute African swine fever

A. *Pigs are visibly weak with fever and huddle to stay warm.*
B-E. *Bloody diarrhoea and distinct hyperaemic (red) areas on skin of neck, chest and extremities.*
F. *Cyanosis (bluing) at the tips of ears.*
G-I. *Necrotic lesions on skin of the abdomen, neck and ears.*

Some of the most recognizable postmortem lesions of acute African swine fever

A. *The gastrohepatic and renal lymph nodes are recognizably haemorrhagic and enlarged when infected with ASFV. Non-diseased tissue is a healthy white/pink colour without inflammation.*
B. *Kidneys infected with ASFV have a notable petechiation (i.e. little pinpoint haemorrhages) on the cortex. Healthy renal tissue is a uniformly coloured light brown without any surface irregularities.*
C. *The spleen of pigs infected with AFSV is often enlarged, friable (fragile) and shows signs of infarction (dark area). Healthy spleens are uniformly coloured (red-brown) and textured.*

Haemorrhagic lesions of acute African swine fever



A. *Heart*
B. *Bladder*
C. *Stomach*
D. *Intestines*
E. *Other serosal surfaces, e.g. liver*

Typical lesions observed in chronic forms of African swine fever

A-F. *Moderate to severe joint swelling, often combined with reddened areas of skin that become raised and necrotic.*
G. *Additional necropsy findings include edematous lymph nodes.*
H. *Pneumonia with caseous necrosis and mineralization of the lungs.*

Differential diagnosis:

(Diseases that may look similar)

- Classical Swine Fever (hog cholera)
  - Same clinical signs
  - Only way to distinguish is with lab findings
- PRRS
  - Fever, abortions, skin discoloration, respiratory issues.
- Chronic form of Circo (Porcine Dermatitis and Nephropathy Syndrome PDNS)
  - Skin lesions (dark red to purple) on hindquarters
- Erysipelas
  - Diamond skin disease
  - Fever and lameness
- Psuedo - rabies
  - Currently erraticated in US Domestic swine
  - Still in feral swine populations within US (Texas)
  - Reproductive and neurologic issues
- Salmonella 7 other bacterial septic infections
  - Pigs dying from septic infections will have discolored to blackened ears and extremities.

Haemorrhages in a pig with classical swine fever (CSF)

Pig suffering from porcine dermatitis and nephropathy syndrome (PDNS)

Characteristic diamond-shaped skin lesions in a pig with erysipelas

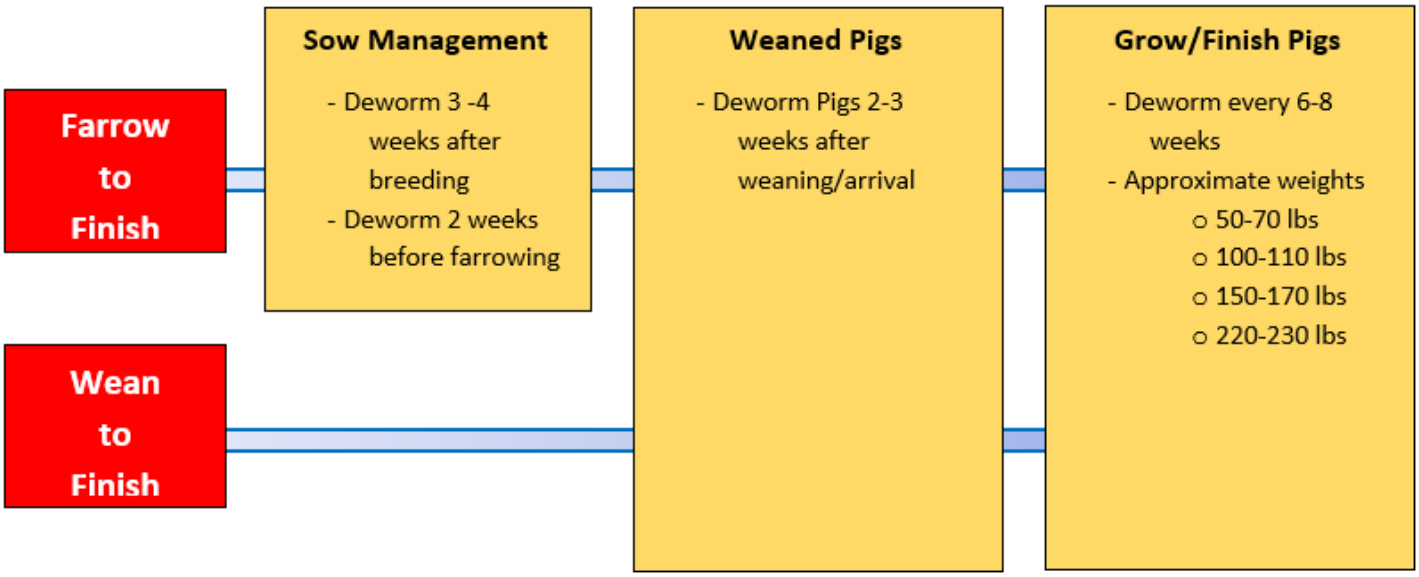
Pig suffering from salmonellosis with cyanotic ears

Are worms eating your profits?

Large roundworms are the most prevalent worm that affects pig productivity. Worm burdens can result in a loss of up to 10% in daily gain and 13% in feed conversion in grow/finish pigs. This causes increased cost of production because of increased food usage and reduced market weights. These losses are because worms take essential nutrients from the pig, which they require to grow. Not only causing production losses, but causing damage to the intestines, liver, and lungs which could cause secondary disease outbreaks, tail biting, and death loss.

It is important to start deworming early. Sows should be wormed 3-4 weeks after breeding and 1-2 weeks before farrowing. This reduces the number of worms that will be shed to the piglets. Piglets should be dewormed 2-3 weeks after weaning/ arrival on a wean to finish farm and then every 6-8 weeks until pigs are market ready. Pigs can be dewormed in the water, feed or by injection. Injectable dewormers like Ivomec and Dectomax are also effective against mange and lice. When selecting a dewormer remember to look at what worms it kills and how effective it is (Figure 1).

Figure 1 Effectiveness (% of adult worms killed by dewormer)	**Safe-Guard Feed Grade (Fenbendazole)**	**Safe-Guard Aquasol (oral) (Fenbendazole)e)**	**Wazine (piperazine)**	**Ivomec (Ivermectin)**	**Dectomax (doramectin)**	**Tramisol (Levamisole)**
Large Roundworm Adults	**X** (92-100)	**X** (92-100)	**X** (75-100)	**X** (90-100)	**X** (90-100)	**X** (99-100)
L_4 Larvae	**X**	**X**		**X**	**X**	
L_3 Larvae	**X**	**X**				
Whipworm Adult	**X** (94-100)	**X** (94-100)				
L_4 Larvae	**X**	**X**				
L_2L_3 Larvae	**X**	**X**				
Nodular Worm Adult	**X** (99-100)	**X** (99-100)	**X** (50)	**X** (86-100)	**X** (86-100)	**X** (80-100)
L4 Larvae				**X**	**X**	
Kidneyworm Adult	**X** (100)	**X** (100)				**X** (80-100)
Larvae	**X**	**X**				
Red Stomach worm Adult	**X** (92-100)	**X** (92-100)		**X** (90-100)	**X** (90-100)	
L4 Larvae				**X**	**X**	
Lung Worm Adult	**X** (97-99)	**X** (97-99)		**X** (99-100)	**X** (99-100)	**X** (90-100)
Administration	Feed	Water	Water	Injectable	Injectable	Feed/Water


Farrow to Finish
Wean to Finish
Sow Management
- Deworm 3 -4 weeks after breeding
- Deworm 2 weeks before farrowing
Weaned Pigs
- Deworm Pigs 2-3 weeks after weaning/arrival
Grow/Finish Pigs
- Deworm every 6-8 weeks
- Approximate weights
o 50-70 lbs
o 100-110 lbs
o 150-170 lbs
o 220-230 lbs

Why check the micron size of your feed? Is it that important?

Reducing particle size (micron size) in finishing from an average of 1000 microns to an average of 700 microns could save about $1.78 per pig per turn. With feed equaling 60 to 75% of the cost of producing a pig, it is important to get the most out of every feed dollar.

Micron size is the term that refers to the average diameter of individual particles of feed. Since, grain represents the primary energy source of mixed diets, producers should be concerned with not only the nutritional quality of the grain but also how it is processed. It is well documented that keeping micron size between 650-800 has a great impact on feed efficiency, by improving digestibility of the nutrients.

Micron size is a relatively inexpensive test and should be a routinely measured. Producers should check ground grain or one complete diet at least twice per year and for larger operations, every 3 months. There are a number of commercial laboratories that can determine particle size along with several different on-farm kits. Most of the Niman Ranch field agents have micron size kits.

The key areas to for on the analysis are average particle size should be between 650-800 microns. There should be less than 10% of the samples should be too coarse (>1400 microns), or to fine (< 450 microns). If the micron size is too high reduced digestibility will be seen and more energy is used digesting the feed. Micron size below 450 increases the occurrence of stomach ulcers, reduced feed intake, and increased risk of respiratory problems.

If you market 8000 hogs per year, at an average feed cost of $250/ton, reducing particle size in finishing from an average of 1000 microns to an average of 700 microns saves about $1.78/pig or $14,240/year.

An investment in a few micron size test per year is well worth the effort.

Mycotoxins: Don't forget the bedding

Dr. Drew White

Mycotoxins have an estimated $5 billion impact on the U.S. and Canadian food animal industries annually. Pigs are extremely sensitive to mycotoxins. Mycotoxins even at low levels reduce performance in growing and breeding pigs. Mycotoxins produce their toxic effects in several ways, including impaired metabolic and nutritional functions. Many mycotoxins damage the liver, reduce average daily feed intake, growth and feed efficiency. Some are teratogenic or carcinogenic causing internal masses and tumors. Some are immunosuppressive and predispose pigs to secondary diseases. Several mycotoxins decrease the reproductive performance of sows. Mycotoxins sometimes are passed in the milk of sows to their litters. The effect of mycotoxins may vary with the amount ingested, the time over which it is consumed, and the age of exposed swine. Young pigs and breeding sows and boars are generally the most susceptible to mycotoxins.

Various mycotoxins cause significant health issues in pigs. These include aflatoxin, ochratoxin, deoxynivalenol (vomitoxin), zearalenone, fumonisin, ergot and T-2 toxin. They can cause acute or chronic effects. Many times, low levels of multiple toxins cause an added effect over time. Lowering the immune system and delaying growth, but not showing outward clinical signs or lesions. This makes it had to diagnosis them.

Pigs are exposed to mycotoxins through feed, bedding and foraging materials. Prevention of mycotoxins is largely through careful selection and proper storage of high quality grains, feed ingredients, and bedding. Quarterly mycotoxin testing of rations and bedding should be performed. If mycotoxins are found grain/bedding sources can be switched or a mycotoxin binder can be added.

Mycotoxin	Effect of Mycotoxin
Aflatoxin B1, B2, G1, G2	Liver damage and immune suppression
Ochratoxin A	Kidney damage and immune suppression
Fumonisin	Pulmonary edema (water filled lung, pneumonia) and immune suppression.
Deoxynivalenol (Vomitoxin)	Vomiting, intestinal lesions, and immune suppression
Zearalenone	Hyper-estrogenism (gilts exhibiting heat at young ages <15 weeks of age)
Fusaric acid	Vomiting, lethargy, reduced blood pressure, swelling of extremities
Ergotoxin	Reduced appetite, gangrene mastitis, mammary gland failure

Mycotoxin quick guide – Symptoms in swine

Symptoms	Aflatoxins	Ochratoxins	Type B Trichothecenes	Type A Trichothecenes	Zearalenone Group	Fumonisins	Other *Penicillium* mycotoxins	Other *Aspergillus* mycotoxins	Ergot Alkaloids	Fusaric Acid*
Abortions					✓				✓	
Acute Hepatitis	✓									
Anemia	✓									✓
Anorexia	✓		✓	✓					✓	✓
Bloody Diarrhea				✓				✓		
Convulsions								✓	✓	
Dehydration		✓								
Delayed Sexual Maturity					✓					
Depression			✓	✓						✓
Diarrhea			✓	✓			✓			
Digestive Disorders	✓		✓	✓		✓	✓			
Pulmonary Edema						✓				
Enlarged Nipples/Udders or Mammary Glands					✓					✓
Enlarged Prepuce					✓					
Feed Refusal	✓	✓	✓	✓			✓			✓
Hyperestrogenic Syndrome					✓					
Impaired Thermoregulation									✓	✓
Increased Mortality	✓	✓	✓	✓					✓	
Increased Urine Production & Water Intake		✓								
Infertility			✓		✓				✓	
Inhomogeneous Groups	✓	✓	✓	✓						
Internal Organs Hemorrhaging	✓	✓	✓	✓		✓				
Irregular Heats					✓					
Kidney Damage		✓								
Lameness	✓		✓	✓		✓			✓	✓
Lethargy		✓	✓	✓		✓				✓
Liver Damage	✓	✓	✓	✓		✓		✓		
Malformation Of Embryo/Fetus			✓	✓	✓				✓	
Milk Contamination	✓				✓					
Oral Lesions			✓	✓						
Prolapsed Vagina or Rectum					✓					
Pseudopregnancy					✓					
Reduced Milk Production	✓		✓	✓		✓	✓		✓	

Aflatoxins/DON-Group/T-2 Group/Fumonisins:

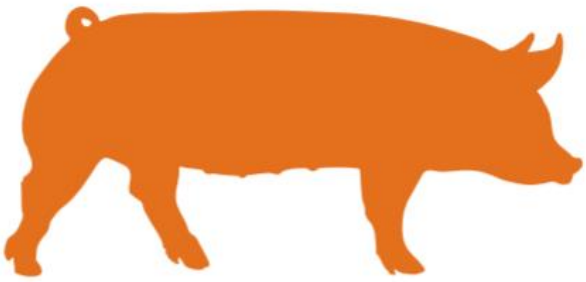
- Damage to gut integrity
- Ulcers and hemorrhages
- Decreased villus height and surface area
- Poor intestinal digestion and absorption
- Undigested feed particles in feces
- Diarrhea
- Enteritis/colibacillosis
- Salmonella infection

Aflatoxins/Zearalenone/DON-Group:

- Poor fertility
- Embryonic mortalities
- Still born piglets/mummies
- Abortions
- Vulvovaginitis/increased vulva size/prolapses
- Decrease in number of piglets born alive

Aflatoxins/Ochratoxins/T-2 Group/DON-Group:

- Poor antibody production/vaccine titers
- Poor cell-mediated immunity
- Altered cytokine profile
- Increased mortality



Ochratoxins/Citrinin/Penicillic acid:

- Kidney damage
- Uric acid crystals in kidneys (gout) and joints
- Increased water consumption/loose feces

Aflatoxins/Ochratoxins/Fumonisins:

- Liver damage
- Liver enlargement
- Fatty liver

T-2 Group/DON-Group:

- Poor feed intake

Fumonisins/Moniliformin:

- Heart enlargement
- Heart failure

Fumonisins:

- Pulmonary edema (water accumulation in lungs)