



BIOSECURITY FACTSHEETS



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BIOSECURITY FACTS



- Disease is a welfare concern for pigs, it leads to ill health, poor growth and/or death; is costly to producers; and can impact export markets
- Pathogens are bacteria, viruses or other microorganisms that cause disease in pigs
- Biosecurity objectives are to keep pathogens from spreading from farm to farm, animal to animal, animal to human, human to animal or country to country
- Biosecurity methods are based on understanding how pathogens spread, and therefore, how to minimize or stop the spread of diseases
- Some bacteria and viruses can live in pigs for a long time without showing signs of disease. When these pigs are stressed they shed the disease agent (bacteria or virus) which can then infect susceptible pigs in the herd
- Clean personal protective equipment should be used routinely (boots must be washed, disinfected and dried or disposable, coveralls must be washed and dried or disposable)
- Limit where vehicles go and personnel walk on the farm
- Regularly clean vehicles (eg. truck) including the exterior and the cab
- Disinfectants cannot eliminate pathogens if organic material (manure, straw, feed) is not removed first
- Cleaning surfaces with detergents and then rinsing prior to disinfection is essential
- Disinfectants are necessary to reduce the likelihood of pathogen spread
- **Steps to remove pathogens:**
 1. Remove visible organic material (manure, straw, feed)
 2. Clean surfaces with detergent and then rinse with pressurized water (hot if available)
 3. Apply disinfectant and leave on for time indicated on label
 4. Allow surfaces to dry killing any remaining bacteria and viruses



Disinfectants



- Follow manufacturer's directions
- Use protective personal equipment suggested: gloves, masks, eye protection
- Efficacy of a disinfectant is its ability to kill the bacteria or virus
- Some disinfectants effectively kill only bacteria or only viruses
- All-in/all-out management – remove all animals from room/barn, carefully clean, disinfect and leave to dry before introducing new animals
- Disinfectants are not able to kill pathogens in the presence of organic matter
- Remove all organic material including manure, straw and feed
- The biofilm that builds up on the walls of barns and livestock trucks must be removed with detergents
- Surfaces need to be washed with detergents and then rinsed prior to applying the disinfectant
- Soap and detergents can inactivate or reduce the efficacy of some disinfectants, so rinse well
- Time to kill is important: disinfectants need to remain in contact with a surface for a specific duration of time as directed on the label
- Colder temperatures and hard water require longer contact times
- Foaming of the disinfectant ensures better coverage and maximum contact time
- Drying is essential to kill the remaining bacteria and viruses not killed by the disinfectant



APP

(*Actinobacillus pleuropneumoniae*)



Pig:

• Gram-negative bacteria • 15 serotypes, some cause more clinical disease than others • Acute outbreaks – pigs have a fever, lethargy (no energy), depression, anorexia (loss of appetite), nonproductive cough, dyspnea (mouth breathing), bloody discharge from nose and mouth. • Pigs (mainly grower/finishers) that look fine one day are dead the next day • Pigs die because the bacteria releases toxins • Death is so sudden that in-feed medication will not reach high enough levels to prevent death, therefore, injectable antibiotics are required • Chronic disease – chronic cough – slow growth leads to weight variation in pens

Spread:

• Nasal secretions and cough • Can live outside the pig (especially in low temperatures) as long as it is kept moist in fluids, such as mucus, nasal discharge, bloody froth from nose and mouth • In a herd with infected carriers any extreme stress such as mixing, and temperature fluctuations will cause the pigs to shed the bacteria resulting in an outbreak. • APP can be carried from one farm to another on pigs or fomites (boots, hands, coveralls) that have been in contact with infected pigs

Barn Control:

• Closed herd, all-in/all-out – cleaning and disinfection – lack of crowding, good air quality, control of other respiratory diseases particularly Mycoplasma which as a co-infection can cause a low virulent APP to lead to disease (others to consider: IAV, PRRSV, and PCV2) • Injectable antibiotics can be helpful (but labor intensive) during an outbreak if used in a timely manner

Visitor Control: (Follow barn's protocol – below are suggested best practices)

- Wear plastic/disposable over-boots in farm yard or wear clean boots that can be enclosed in a bag to be cleaned, disinfected and dried prior to the next use
- Do not step into the truck with boots that have touched the ground
- Avoid contact with dead stock and infected pigs
- Do not enter the barn during a disease outbreak
- If barn entry is necessary, stay out of rooms with pigs, wear farm boots and coveralls and wash hands before leaving



Flu (Influenza A virus)



Pig:

- Influenza occurs year round, although acute outbreaks happen more often in the late fall and early winter
- Acute outbreak: pigs have a high fever, stop eating, are inactive and have a loud, barking cough; many have nasal discharge. The clinical onset is rapid, most or all pigs regardless of age in the barn are affected at once. Few pigs die although mortality can increase if the infection is complicated by other viruses or bacteria
- Chronic disease: in a herd that has been infected by influenza, the virus can continue to spread from pig to pig. Many pigs have some immunity, but as their immunity decreases, they become susceptible. Influenza causes coughing, and slow growth rate, as part of a complex of diseases causing pneumonia

Spread:

- Oral-nasal route, pig to pig, spreads quickly through the air in the barn to the whole herd; airborne over long distances
- Individual pigs shed virus for 5 days

Barn Control:

- Pigs need to live in a warm, dry environment and have good access to water to recover from the viral infection
- All-in/all-out management with washing and disinfecting room/barns in between is helpful; virus is killed by drying
- Depopulation of a continuous flow barn will help to stop the spread of the virus
- Commercial vaccines are available
- Keep birds out of the barn and do not raise turkeys, ducks or chickens on the same farm location as pig viruses can move between birds and pigs

Visitor Control: (Follow barn's protocol – below are suggested best practices)

- Avoid going into barns if you have the flu; wear a mask when entering a barn, especially if you have a cough
- If barn entry is necessary, wear farm boots and coveralls, a mask, clean gloves (disposable and wash and dried) or alternatively wash hands when entering and leaving the barn
- People working around pigs or poultry should receive a seasonal influenza vaccine annually

Warning: ZOOONOTIC – can pass from people to pigs and from pigs to people



Ileitis

(*Lawsonia intracellularis*)



Pig:

- Caused by *Lawsonia intracellularis* bacteria
- Affects mostly grower/finisher pigs but can affect nursery pigs and incoming breeding stock
- Two clinical presentations: sudden onset of death, or bleeding from the intestine followed by death. Most pigs with this form will die and the affected pigs are typically breeding stock or older finishing pigs; the 2nd form is chronic (long lasting presentation) where pigs have slow growth rate, leading to a wide variation in the weight of the pigs in the same pen. Pigs will have normal colored manure that varies from normal consistency to diarrhea. Pigs with this form are usually 6 to 20 weeks of age and are considered "poor doers". Affected pigs develop a thickened gut wall.
- Economic losses due to slow growth, poor feed conversion, and/or death of valuable gilts

Spread:

- Spread by fecal-oral route (manure to mouth)
- Incubation period (time from contact to disease) is 2 – 3 weeks
- Clinically healthy pigs can shed the bacteria and insects and rodents can act as fomites, spreading the bacteria in the barn

Barn Control :

- Reducing the amount of bacteria by thorough cleaning, disinfecting and drying • insect and rodent control
- Decrease stress (mixing, transport, temperature variation)
- Effective vaccine is available (given orally in the water) which will decrease the need for antibiotics
- Antibiotics must be removed from the feed prior to the use of the oral vaccine

Visitor Control: (Follow barn's protocol – below are suggested best practices)

- Bacteria is present on most farms and negative herds typically become infected by bringing a positive pig onto the premise
- Bacteria is unlikely to be spread to a negative herd by a visitor, however visitor biosecurity is always important



Myco

(*Mycoplasma hyopneumoniae*)



Pig:

- Pigs have a dry, unproductive cough, fever, decreased appetite, and may have difficulty breathing
- Lower average daily gain, longer days to market causes increased feed costs and overcrowded barns
- Increased size variation of the pigs in same pen/barn affects all-in/all-out systems, lost returns due to shipping smaller pigs
- Many pigs become sick (high morbidity) but mortality is low unless Myco is complicated with other respiratory diseases such as PRRS, IAV (influenza), PCV2 (circovirus), or *Strep. suis*
- Occurs all year but outbreaks often occur in the spring and fall with warm days and cold nights
- Grower/finisher pigs are most often affected but nursery and breeding-stock pigs can also be sick

Spread:

- Slow to spread through the herd – typically needs nose-to-nose contact
- Also spreads through the air from the coughing
- Mycoplasma survives if kept moist; aerosal spread up to 9 km in humid weather has been reported
- Maternal immunity lasts 7-12 weeks, pigs go through 5-6 weeks of clinical signs as maternal immunity wanes

Barn Control:

- All-in/all-out management, vaccination of nursery or nursing pigs
- Use off-site, medicated early weaning to decrease clinical disease
- Good air quality, reduce temperature fluctuations, prevent overcrowding and minimize mixing of pigs
- Keep other respiratory diseases (such as PRRS, IAV, and PCV2) under control

Visitor Control: (Follow barn's protocol – below are suggested best practices)

- Wear plastic/disposable over-boots in farm yard or wear clean boots that can be enclosed in a bag to be cleaned, disinfected and dried prior to the next use
- If barn entry is necessary wear farm boots and coveralls and wash hands before leaving the barn



PED

(Porcine Epidemic Diarrhea)



Pig:

Coronavirus. There are several different strains that vary the severity of disease. In a newly infected, negative herd: Vomiting, sudden onset of watery diarrhea, loss of appetite in all ages of pigs (high morbidity). Suckling pigs have high mortality (> 80%) and older pigs have a lower mortality (1-3%). In an infected herd that is recovered from the acute phase there often is an ongoing diarrhea in older suckling piglets or recently postweaned pigs that can mimic similar diseases including TGE, Rotavirus, *E. coli* diarrhea, or Porcine delta corona virus. In grower/finisher pigs, the diarrhea mimics Salmonellosis, and Ileitis (*Lawsonia intracellularis*).

Spread:

- Spread by fecal-oral route (manure to mouth) for up to 30 days
- Infected pigs or any materials that might transport manure can transfer the virus to another location
- Virus can live in manure for extended periods of time if it is kept wet or frozen

Barn Control:

- All-in/all-out management with washing and disinfecting the room/barn
- Routine testing of pigs from all phases of production to determine when the virus has been eliminated from the herd

Visitor Control : (Follow barn's protocol – below are suggested best practices)

- Wear plastic/disposable over-boots in farm yard or wear clean boots that can be enclosed in a bag to be cleaned, disinfected and dried prior to the next use · do not step into the truck with boots that have touched the ground
- WARNING: If you are aware of a farm that has a clinical outbreak, vehicles should go to this farm last in the day and last in the week
- Do not drive to another farm until the outside and cab of truck have been cleaned and disinfected
- Disinfection of truck: remove all visible organic material, wash with water (hot if available) and a detergent, rinse, apply disinfectant and leave to dry

WARNING: Do NOT enter the barn during a PED outbreak
– leave all deliveries/paperwork to this farm in an alternative location



PRRS

(Porcine reproductive and respiratory syndrome)



Pig: Viral disease. All age groups affected: off feed, fever, depressed, respiratory distress and death. Reproductive losses include decreased farrowing rate, abortion, weak-born piglets, increased stillbirths and mummies. Deaths in all ages of pigs are higher than expected. Wide variation in growth in older pigs. PRRS virus reduces the pig's immune system so they are more susceptible to other diseases such as *Mycoplasma hyopneumoniae*, influenza type A, and *Strep. suis*. There are many strains of the PRRS virus and the virus continues to mutate as it multiplies in the pig. A farm can be infected with more than one strain at a time. A PRRS positive herd can have a 2nd clinical outbreak if a new strain is introduced to the herd.

Spread: Infected pigs begin shedding large amounts of virus within 24 hours of becoming infected. Pigs can continue to shed the virus for 90 days. Some sows become "long-term carrier pigs" that shed the virus intermittently when they are stressed. Virus is shed in all bodily fluids as well as feces. Birds and rodents can be mechanical carriers as are mosquitos and flies. Other fomites shown to be mechanical carriers include (but are not limited to) truck tires, bags, boxes, boots and coveralls.

Barn control: Negative herds

Recommend using a shower-in system or at least provide dedicated boots and coveralls for visitors. Isolate and test all incoming breeding stock animals.

Visitor Control: (Follow barn's protocol – below are suggested best practices)

All herds:

Wear plastic/disposable over-boots in farm yard or wear clean boots that can be enclosed in a bag to be cleaned, disinfected and dried prior to the next use · do not step into the truck with boots that have touched the ground

- If barn entry is necessary wear farm boots and coveralls
- Double-bag materials brought onto the farm so the outer layer can be removed prior to being moved into the barn

Positive herd with active infection:

- Vehicles going to farms with active infections should go last in the day and last in the week
- Disinfection of truck: remove all visible organic material, wash with water (hot if available) and a detergent, rinse, apply disinfectant and leave to dry

**WARNING: Do NOT enter the barn with active PRRS outbreak
– leave all deliveries/paperwork to this farm in an alternative location**



Salmonella



Pig:

- Salmonella cholerasuis only affects pigs and causes septicemia (infection throughout the body)
- Salmonella typhimurium causes diarrhea and in chronic infections causes rectal strictures in pigs
- Pigs shed salmonella in manure when sick but also shed the bacteria intermittently when they are healthy

Spread:

- People can become infected with salmonella from a variety of sources including raw eggs, poultry, pork, beef, and from handling pigs, poultry, turtles, rodents, and also from a variety of nuts and vegetables
- In Ontario, Salmonella can be found in 46% of pig farms and 11% of finisher pigs on these farms
- Salmonella will be shed most commonly when pigs are stressed by being trucked, overcrowded, or exposed to seasonal weather changes
- Salmonella contamination of feed trucks and of feed ingredients is a possible source of transmission to pigs
- Bacteria can also be spread to pig farms through contaminated water
- Other livestock, poultry, rodents and wild birds can spread salmonella to pig barns and pig feed

Barn Control:

- Salmonella prevalence in a group of pigs may be reduced by changing the composition of feed from pelleted to mash, from fine to coarse grind or from dry to liquid feed
- All-in/all-out management with washing, disinfecting and drying of rooms/barn between groups
- Oral vaccines work well to control Salmonella in pigs

Visitor Control: (Follow barn's protocol – below are suggested best practices)

- Wear plastic/disposable over-boots in farm yard or wear clean boots that can be enclosed in a bag to be cleaned, disinfected and dried prior to the next use
- Disinfection of truck: remove all visible organic material (manure, straw, feed), wash with water (hot if available) and a detergent, rinse, apply disinfectant, allow disinfectant contact time and then allow the truck to dry



Strep

(*Streptococcus suis*)



Pig: There are 35 serotypes, specific types are the most likely to cause clinical disease in pigs. Clinically affected pigs have a high fever, seizures, and high mortality if not treated quickly and effectively. Pigs that recover, may have a permanent head tilt or balance problem, others recover with no apparent problems. Older pigs have ataxia (lack of muscle coordination), convulsions, blindness, deafness, and tremors or seizures. This bacteria causes septicemia (infection throughout the pig's body), acute meningitis, arthritis, polyserositis (infection in the joints, and the inside of the abdomen and the chest cavity) and bronchopneumonia. Healthy carrier pigs shed the bacterial but do not show any clinical problems. Sows infect their piglets during and after birth.

Spread: Bacteria lives in the nose and tonsils of healthy pigs and in the birth canal of sows. Pigs shed bacteria in mucus from nose and mouth and in feces. So, nose-to-nose contact with an infected pig or eating or breathing in the dust or fecal matter will transmit the bacteria. Cuts in the skin allows the bacteria to enter the body.

Bacteria is viable in water for 1 – 2 weeks; survives for 8 days at 25°C but up to 54 days in dust during colder temperatures; lives in deadstock for 12 days at 25°C but for 6 weeks when kept cold. Lives on flies for 5 days.

Other animals such as dogs, cows, sheep, goats and horses can also be affected by other streptococcus species.

Barn Control: Piglets can be infected at birth so early weaning does not eliminate the bacteria from a group of pigs. Reduce stresses (overcrowding, poor air quality, high humidity and improper cleanliness). All-in/all-out management of barn.

Some strains are resistant to common antibiotics so it is necessary to complete culture and sensitivity testing prior to selecting the most effective antibiotic. Control PRRSV and Influenza A virus to reduce outbreaks of clinical *Strep suis* infections.

Visitor Control: (Follow barn's protocol – below are suggested best practices)

- Wear plastic/disposable over-boots in farm yard or wear clean boots that can be enclosed in a bag to be cleaned, disinfected and dried prior to the next use
- If barn entry is necessary wear farm boots and coveralls and wash hands before leaving
- Liquid soap deactivates bacteria, very susceptible to disinfectants but thorough washing is necessary
- Disinfectants are very effective after thorough washing

ZOONOTIC: *Strep. suis* bacteria can grow and live for extended periods of time in the nose and throat of pigs. Can also be cultured from the nose and throat of humans. While human illness due to *Strep. suis* is rare, the clinical problem is serious. People may develop meningitis (infection of the brain), inner ear infections, and other systemic problems and may result in a permanent balance disorder.



Swine Dysentery



Pig:

- Swine dysentery is caused by a bacteria called *Brachyspira hyodysenteria*
- Affected pigs have diarrhea with blood and mucus, anorexia (loss of appetite), are depressed, lose weight and many die mortality is typically 30%
- Clinical problems are most common in grower/finisher pigs but nursery pigs and sows may also be affected

Spread:

- Spread by fecal-oral route (manure to mouth)
- Pigs can be carriers for long periods (more than 90 days)
- Rodents, dogs and birds can become infected and spread the bacteria
- Bacteria lives in manure pits for several months and survives in moist manure in the barn for >60 days
- Carried from farm to farm with pigs, in manure, and on fomites (objects) such as boots, coveralls and truck tires

Barn Control:

- Control rodents; keep cats and dogs out of barn
- Drying and high temperatures (>37°C) kills the bacteria within 24 hours
- All-in/all-out with cleaning and disinfection reduces risk and limits spread of infection
- Eradication of disease by depopulation
- Antibiotic resistance requires appropriate culture and sensitivity to ensure correct antibiotic is used
- Sick pigs are not eating, so antibiotics need to be given IM and/or in the water

Visitor Control: (Follow barn's protocol – below are suggested best practices)

- Wear plastic/ disposable over-boots in farm yard or wear clean boots that can be enclosed in a bag to be cleaned, disinfected and dried prior to the next use
- Disinfection of truck: remove all organic material with water (hot if available), use detergent, rinse, apply disinfection, dry

**Warning: Do NOT enter the barn during a Swine Dysentery disease outbreak
– leave all deliveries/paperwork to this farm in an alternative location**



TGE

(Transmissible Gastroenteritis)



Pig:

- Short incubation period (time from when pig is exposed to the virus to the start of diarrhea) - 18 hours to 3 days
- Treatment: pigs less than 2 weeks old will die, 2 – 5 week old pigs can be given electrolytes, older pigs will recover on their own

Spread:

- Survival of virus: this virus is more prevalent in winter because it is stable when frozen, it is also more stable if kept moist in mucus or manure
- The virus is inactivated if it is dry and exposed to 6 hours of sunlight
- Virus can survive 8 weeks at 5°C in liquid manure, 2 weeks at 20°C and but only 24 hours at 35°C
- Virus spread by pigs, rodents, dogs, cats, foxes, starlings and insects

Barn Control:

- All-in/all-out management
- Control rodents and insects and do not allow birds or other animals in the barn

Visitor Control: (Follow barn's protocol – below are suggested best practices)

If you are aware of a farm that has an outbreak of TGE

- Vehicles going to this farm should **go last in the day and last in the week**
- Wear plastic/disposable over-boots in farm yard or wear clean boots that can be enclosed in a bag to be cleaned, disinfected and dried prior to the next use
- Do not drive to another farm until outside and cab of truck has been cleaned and disinfected
- Disinfection of truck: remove all organic material with water (hot water if available), use detergent, rinse, apply disinfection, allow disinfectant contact time and dry

**WARNING: Do NOT enter the barn during a TGE disease outbreak
– leave deliveries/paperwork to this farm in an alternative location**



References



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PED

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All references were accessed January 19, 2016