



Swine health handbook

for Yukon farmers

Yukon

The Yukon Livestock Health Program

The Yukon Livestock Health Program is a collaboration between the Government of Yukon's Animal Health Unit (AHU) and Agriculture Branch and local Yukon veterinarians. The program provides support to Yukon farmers by producing educational publications and workshops on livestock health, biosecurity and food safety. The program will also support access to livestock health services through private veterinarians.

Yukon farmers with livestock health and disease concerns can contact the AHU for advice, and are encouraged to get in touch any time there is an unexpected change in the health of their pigs.

Government contacts

Animal Health Unit, Government of Yukon

Environment Yukon, 10 Burns Road, Whitehorse, YT Y1A 4Y9

Phone: 867-667-5600

Toll free: 1-800-661-0408, ext. 5600

Email: animalhealth@gov.yk.ca

Agriculture Branch, Government of Yukon

Room 320, Elijah Smith Building, 300 Main Street,
Whitehorse, YT Y1A 2B5

Phone: 867-667-5838

Toll free: 1-800-661-0408, ext. 5838

Email: agriculture@gov.yk.ca

Canadian Food Inspection Agency (CFIA) District Office

2008 - 8th Street, Unit 2, Dawson Creek, BC V1G 4Y5

Phone: 250-719-6855

Email: dawsoncreek@inspection.gc.ca

Yukon veterinary clinics

All Paws

Veterinary Clinic

9 Metropolit Lane
Whitehorse, YT
867-667-7387

Copper Road

Veterinary Clinic

128B Copper Road
Whitehorse, YT
867-633-5184

Oakley Vet Services

Haines Junction, YT
867-335-5894

Alpine Veterinary

Medical Centre

107 Copper Road
Whitehorse, YT
867-633-5700

Dr. John Overall

Dawson City, YT
867-993-5205

Useful websites

The Pig Site

thepigsite.com

Pork Information Gateway

porkgateway.org

Prairie Swine Center

prairieswine.com

Alberta Agriculture

www.agric.gov.ab.ca/app21/infopage?cat1=Livestock&cat2=Pigs

Ontario Ministry of Agriculture Food and Rural Affairs

omafra.gov.on.ca/english/livestock/swine/health.html

University of Missouri – Extension

extension.missouri.edu/main/DisplayCategory.aspx?C=17

National Pork Board (American)

pork.org/production-topics/swine-health/

Iowa State University Swine Disease Manual

vetmed.iastate.edu/vdpam/about/production-animal-medicine/swine/swine-disease-manual

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Photo credit: open source.

A note about icons

Each condition in this book will include an icon that indicates the severity of a disease and an icon that indicates the contagiousness of a disease.

Severity means “how sick will my pigs get?”



- ▶ **Life-threatening:** Systemic disease that affects multiple body systems.
- ▶ **Moderate:** Often localized to a single body system and responds to appropriate treatment.
- ▶ **Production limiting:** Evident through decreased growth and productivity.

Contagiousness means “how many pigs will get sick?”

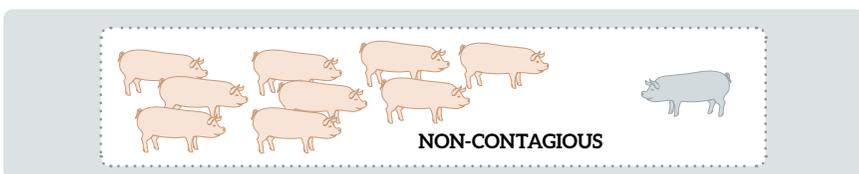
In these icons, pink pigs represent healthy animals and grey pigs represent sick animals.



- ▶ **Highly contagious:** These diseases spread easily between animals. These diseases are best prevented by separating affected pigs as soon as symptoms are noticed and maintaining strict biosecurity between affected and unaffected pigs.



- ▶ **Moderately contagious:** Some diseases only spread given the right timing and/or environmental conditions. Diseases described as “triggered by stress” usually fall into this category. Affected pigs should be separated but this is as much for their own welfare as to protect the other pigs. It is still good practice to handle affected pigs at the end of the day after caring for the main herd



- ▶ **Non-contagious:** These diseases include management, environmental and nutritional diseases that are not spread from pig to pig.

Top 10 swine health tips

Top 10 swine health tips

1. Buy from a healthy herd

- ▶ New pigs are the most common way that diseases are brought into a herd.
- ▶ Buy from a single source herd that has been tested and is free of, or vaccinated for, common diseases (see “What Else Should I Know” on page 10).
- ▶ Ask the seller what vaccines the pigs have had – pigs may require vaccination or boosters after purchase.
- ▶ Ask the seller questions from a pre-purchase checklist that you have developed with your veterinarian’s advice.

2. Provide adequate shelter

- ▶ Pigs require shelter that protects them from extreme weather and from predators. Electric fences protect pigs and prevent escape.
- ▶ Straw makes good bedding provided it is not moldy. Keep bedding dry and change it completely between batches of pigs.
- ▶ Rotate pigs between pastures. Their foraging behaviour can be aggressive and they can rapidly damage vegetation. Pasture rotation also reduces the spread of disease because pathogen numbers may be reduced by sunshine or freezing.

3. Clean barns regularly

- ▶ Pathogens can survive year to year inside the barn. This buildup is a significant threat to newly introduced pigs, especially young piglets.
- ▶ Remove all bedding, feces and spilled food regularly, especially where conditions are damp.
- ▶ Each pen should be scraped, washed, disinfected and dried between batches of pigs.
- ▶ The entire barn should be washed and disinfected yearly.



Photo credit: open source.

4. Quarantine new pigs

- ▶ Pigs can carry diseases without showing any signs of illness.
- ▶ Establish an isolation pen or area of the farm that is separate from livestock, especially from other pigs that are already on the farm.
- ▶ Quarantine newly purchased pigs in this area for 30 days, provided they remain healthy. The quarantine time should be extended if any new pigs are treated for illness.
- ▶ Newly purchased pigs can be treated for parasites or be given vaccinations during quarantine.
- ▶ Do chores for the quarantined pigs after caring for the main herd pigs. It is a good idea to have boots and coveralls that you only use for chores with quarantine pigs.
- ▶ Avoid going to the main herd after caring for pigs in quarantine to prevent the spread of any disease to your main herd.

Top 10 swine health tips

5. Avoid stress

- ▶ Pigs carry pathogens that may cause illness when the animal is stressed.
- ▶ Common stressors include: overcrowding, mixing groups or adding pigs, empty feeders or waterers, dirty barns, poor ventilation, drafts, severe weather or rapid changes in weather.
- ▶ Move pigs gently. A push board (half-sheet of plywood with a handle) is an excellent tool to gently encourage pigs to move. Never use dogs or electric prods.
- ▶ During and after stressful events watch the herd closely for signs of illness.

6. Check pigs every day

- ▶ Pigs need feed and water every day. Limited or erratic access to feed creates stress and increases the risk of disease.
- ▶ Pigs without water for more than 6 hours can develop a fatal brain condition (see section on “Water Deprivation” on page 82).
- ▶ Many diseases have a sudden onset. Pigs need to be checked daily to ensure sick animals can be treated quickly.
- ▶ Count pigs daily to ensure you are not missing death loss. Dead pigs, especially young ones, may be cannibalized by pen-mates.

7. Have a sick pen

- ▶ Move sick pigs into the isolation pen to protect them from being attacked by pen-mates and allow them to have better access to resting areas, food and water.
- ▶ Mark pigs when they are treated with drugs – a grease marker works well. Keep records of what was given and when. Do not slaughter before the drug withdrawal time is complete.
- ▶ Separating sick pigs decreases the risk of spreading disease to the rest of the herd.

8. Feed a balanced ration

- ▶ Dietary needs depend on the stage of production. Newly weaned pigs need a palatable and digestible diet to ensure they start on solid food and to minimize diarrhea. As pigs age, the diet can be adjusted to use lower cost ingredients.
- ▶ Sows need higher fiber diets before farrowing and very high energy diets during lactation to produce enough milk without losing body condition.
- ▶ Commercial diets are balanced for vitamins, minerals and amino acids. Feeding a commercial diet will ensure your pigs do not have nutritional imbalances that affect growth.
- ▶ Many commercial diets contain antibiotics. Know if any antibiotics are in your feed, why they have been included, and the withdrawal time. Don't pay extra for drugs that are not needed.
- ▶ Body score your pigs regularly to be sure they are receiving appropriate nutrition (see page 31).

9. Have a health plan

- ▶ Work with a veterinarian to build a health plan that includes vaccination, deworming, treatment, euthanasia and biosecurity for your herd.
- ▶ In order for your veterinarian to treat your animals based on a telephone conversation, they must have a documented client-patient relationship with your farm. Developing your herd health plan with the clinic will serve to establish this.
- ▶ Once this relationship is confirmed and the veterinarian understands your herd health issues and management plan, they may prescribe drugs and provide for supportive treatment that you can administer to your animals if they cannot make a farm visit.

Top 10 swine health tips

10. Keep records

- ▶ Records are the best way to know where you are making money.
- ▶ Records help you learn from past problems and predict what will happen with your herd.
- ▶ Treatment records are critical to ensure pigs are not slaughtered for food before a drug withdrawal time is complete.

What else should I know?

Before you buy pigs, ask the seller about the status of the source herd for these diseases. For each disease, ask if the source herd is free of the disease, or if the herd is vaccinated or treated for it.

- Porcine circovirus 2 (PCV2)
- Erysipelas
- Mycoplasma spp.
- Swine influenza virus
- Porcine reproductive and respiratory syndrome virus (PRRSv)
- Swine dysentery
- Internal parasites
- External parasites
- Transmissible gastroenteritis (TGE)/Porcine epidemic diarrhea (PED)/Delta corona virus

Tips for slaughter of swine

Withdraw feed for 6 to 24 hours prior to slaughter. The reduced amount of feed in the gut will make it easier to cleanly eviscerate the animal. Continue to allow access to water.

Consider moving the selected pig away from the group before slaughter so that killing and bleeding do not take place in view of other animals in the herd. Swine are highly intelligent animals. Their reaction to the death of a pen-mate and the presence of blood will vary, but some individual animals express distress. This can make the slaughter process less efficient and is an unnecessary stress to the remaining animals in the herd.

Slaughter only healthy animals.

- ▶ Injured animals (fractures, broken back, etc.) are acceptable for emergency slaughter only if they can be killed humanely and do not have a fever ($\geq 40^{\circ}\text{C}$). Meat at the area of injury would not be considered suitable for consumption and these areas should be trimmed widely and affected tissues discarded.
- ▶ Animals that have been treated with a veterinary drug must not be sold or used for food until the label withdrawal time has passed.

On-farm slaughter must be humane

- ▶ The slaughter method must produce immediate unconsciousness before the pig is bled out. Suitable methods include a gunshot or a captive bolt pistol.
- ▶ The person responsible for killing the animal must be experienced and confident to ensure a humane death.
- ▶ Bleeding out can be accomplished with a very sharp knife that is inserted at the angle of the jaw and drawn deeply along the neck to the V at the front of the chest. This will open the main artery in the neck and bleeding should be rapid and complete within 4 minutes, at which time the heart will stop beating and the carcass can be opened.

Tips for slaughter of swine

Keep it clean

- ▶ The carcass should be suspended or placed on a clean surface so that it does not come into contact with the floor during processing.
- ▶ Use potable water (i.e., acceptable for drinking) in all steps.
- ▶ Use only clean knives and equipment. Clean equipment regularly throughout the process. Remove all blood and visible contamination using warm water, approximately 85°C.
- ▶ Sanitize knives and equipment only after they are clean.
- ▶ Household bleach can be used to sanitize according to label directions.
- ▶ Wear aprons, boots and gloves that can be washed and disinfected.

Avoid contamination

- ▶ Any part of the carcass that is contaminated with gut contents or by contact with a dirty surface during evisceration must be trimmed and discarded.
- ▶ Any knife that cuts into the guts must be cleaned and sanitized before re-use.
- ▶ Scalding, skinning and evisceration should be done in a separate area from cutting and wrapping.

Carcasses with internal abnormalities or evidence of disease must not be sold or used for human consumption.

Be careful when eviscerating carcasses, especially if you see any swellings or internal abnormalities. Internal swellings or fibrous bands between tissues may indicate an infection. Loops of gut may be within external swellings (hernias). It is harder to eviscerate without contaminating the carcass in these situations.

Any abnormal tissues can be cut off the carcass with a wide margin of normal tissue surrounding the abnormal tissues and brought to your veterinarian or to the Animal Health Unit for a professional opinion about the cause.

Tips for slaughter of swine

A whole carcass should not be used for human consumption (condemned) if it shows evidence of:

- ▶ Multiple swollen or infected joints.
- ▶ Multiple abscesses (pockets of pus).
- ▶ Multiple swollen lymph nodes (glands along the neck, in the chest, behind joints or in the abdomen).
- ▶ Evidence of cancer.
- ▶ Meat with an unusual colour, odor or texture.
- ▶ Extensive hemorrhages in multiple organs or very dark colour of multiple organs.

The following abnormalities are not suitable for human consumption and should be trimmed from the carcass with a wide margin (10 cm) of normal tissue and discarded:

- ▶ A single swollen or infected joint.
- ▶ A single abscess.
- ▶ Adhesions (fibrous bands or tags) in chest or abdominal cavity.
- ▶ White scars or spots on liver (usually discard whole liver).

Prevent bacterial growth

- ▶ Remove the viscera as soon as the pig is dead.
- ▶ Chill the carcass to 7°C or less within 1 hour of killing.

Label meat with the date slaughtered and the cut of meat. If it will be sold off-farm, the label should also include your name and contact information.

Food safety

Safe food starts with a healthy animal. Never slaughter animals for consumption if they are sick or have been treated with a veterinary drug until the label withdrawal time has passed. This drug withdrawal time is established by law to ensure that there are no residues of the drug remaining in the meat that might be a hazard to human health.

A **foodborne illness** is a sickness caused by eating food contaminated with a bacterial, chemical or physical hazard. Bacteria can contaminate meat during slaughter or processing. These bacteria can also spread to other food from raw meat juices or contaminated kitchen equipment. Even meat from healthy pigs can be contaminated with bacteria that can cause illness.

Under ideal conditions, bacteria can divide every 20 minutes. One bacterium on a piece of meat can become 2 million bacteria in just 7 hours at room temperature! Temperatures under 5°C or greater than 60°C kill most bacteria or prevent them from growing, but food kept between these temperatures is in the **DANGER ZONE**.

Keep it clean

- ▶ Wash hands regularly while handling and preparing food. Use warm water and soap for at least 20 seconds.
- ▶ Keep food preparation areas and equipment clean and sanitized.
- ▶ Clean with warm water and soap to remove all visible contamination.
- ▶ Sanitize by immersing or spraying clean equipment with a bleach solution of 200 ppm (1 tablespoon of bleach in 1 gallon of water).

Avoid contamination

- ▶ Prevent contact of raw meat, raw meat juices or contaminated equipment with any ready to eat foods (e.g., salads, raw vegetables, cooked foods).
- ▶ Thaw meat in the refrigerator, under cold running water, or in the microwave. Never thaw meat at room temperature because the surface will thaw more quickly and that meat will be at a temperature in the **DANGER ZONE** where bacteria will grow rapidly.
- ▶ Thaw meat on the lowest level of the refrigerator so juices won't drip onto other foods.

Cook properly

- ▶ Smoking, brining and freezing do not kill all bacteria or parasites that can spread from meat to cause infections in people.
- ▶ For complete food safety, Health Canada recommends that meat should be cooked to an internal temperature of 71°C. This is critical for ground meat products. Cooking to 63°C will kill parasites and bacteria, but this temperature is not universally recognized as safe.
- ▶ The temperature should be checked using a meat thermometer. Methods such as “juices running clear” or “joints move easily” are not reliable indicators.

Store properly

- ▶ Fresh uncooked meat should be stored between 0°C and 4°C and used within 3 days.
- ▶ Frozen meat should be stored at -18°C or below.
- ▶ Cooked meat should be held at 60°C or above until eaten.
- ▶ Left-over meat can be stored between 0°C and 4°C and should be used within 3 days or frozen for longer storage.

Foodborne disease risks

A **pathogen** is a bacterium, virus or parasite that can cause disease. Some pathogens can infect people from the meat of apparently healthy pigs. In most cases these foodborne illnesses include stomach pain, vomiting, diarrhea, fever, chills and aches. Contact your physician if these symptoms occur, especially among several individuals who have shared a meal.

Foodborne illness can be prevented by proper handling and cooking of pork products. The major concerns for Canada's pork industry include:

- ▶ *Salmonella* are bacteria that can be present in the gut, even in pigs that are healthy. Pork is not a major source of *Salmonella* infections in people but control of *Salmonella* is a priority for all meat producers. *Salmonella* contamination of meat is minimized by careful evisceration to avoid contamination of the carcass with gut contents. Consumers must handle and prepare meat properly to control this hazard.
- ▶ *Campylobacter* bacteria can also live in the guts of pigs. Like *Salmonella*, pork is not a major cause of *Campylobacter* infections in people but it can happen. The control of *Campylobacter* is the same as *Salmonella*.
- ▶ *Trichinella* are tiny parasites that can live in the muscle of pigs. Infected pigs are not typically sick. This condition was much more common when pigs were fed kitchen scraps because the pigs became infected by eating contaminated meat (i.e. scavenging on wild animal carcasses and garbage). This is one reason it is illegal to feed meat to pigs. There is no treatment that can kill the parasite in the live pig. As a point of interest, this parasite is also found in wild species including bears and walrus.
- ▶ *Toxoplasma* is a parasite that can infect pigs. Cats shed the eggs of this parasite in their feces and pigs can become infected either from exposure to cat feces or by eating rats and mice that have been exposed to cat feces. If a pregnant woman is exposed, the fetus can become infected and the baby may develop blindness or other problems later in life. It can be prevented by controlling rodents and keeping cats out of pig barns.

Top 10 biosecurity tips

Biosecurity includes all the actions you take every day to protect your herd's health. Your farm should have protocols that are effective and practical – everyone on the farm needs to know and follow these rules.

Biosecurity works when it becomes part of the daily practice on the farm. The two key principles are to *Keep Hazards Out* and *Contain Hazards if They Occur*.

Keep hazards out

1. Incoming pigs

- ▶ Buy pigs from herds with a known health status. If buying from multiple sources, be sure they are of comparable health status.
- ▶ The isolation area should be at least 120 m from the main herd.
- ▶ New pigs should be quarantined for 30 days and monitored daily for any illness.
- ▶ If outdoor pens are used, the isolation pen should be downwind of, and not drain toward, the main herd to prevent spread of any illness from newly introduced pigs.



Photo credit: open source.

Top 10 biosecurity tips

2. Trucks and transport

- ▶ Ensure all trucks and trailers are washed, disinfected and dried before they pick up or deliver pigs.
- ▶ Wash tractors or other farm vehicles that are shared between herds.

3. People

- ▶ People should not be allowed into your pig barn within 24 hours of contact with pigs on another farm.
- ▶ Many high health pig herds follow a system that requires people to shower before entering barns! A less intense biosecurity approach is changing boots and coveralls and washing hands before entering the pig barn.
- ▶ Consider having visitors clean their boots before entering your barns, especially if they are wearing boots that they wear when working with their livestock. Most diseases are spread by manure and boot treads can carry plenty.

4. Animals

- ▶ Dogs, cats, rodents and wildlife can carry diseases that infect pigs and these animals can spread disease between groups of pigs.
- ▶ A rodent control program should be in place on your farm. Other animals should be excluded from swine barns whenever practical.
- ▶ Pigs can be quite aggressive and have been known to kill and eat smaller animals. For the protection of companion animals, they should be excluded from swine barns.

5. Meat products

- ▶ No fresh raw, smoked or dried meat should be fed to pigs or be stored or present in areas where pigs are housed and can access it.
- ▶ To prevent the spread of disease, it is illegal in Canada to feed scrap products that contain raw meat to swine.

6. Dead stock removal

- ▶ Dead pigs should be removed from the pen as soon as possible to prevent cannibalism. Pigs are curious, and as omnivores they readily consume meat, including other pigs.
- ▶ Dead stock should be disposed of in a manner that prevents rodents, mice or other animals, including other pigs, from feeding on carcasses.
- ▶ Dead stock must be disposed of in a manner that does not attract wildlife and encourage scavenging.

7. “Zone” your farm

- ▶ Ideal biosecurity systems divide the farm into zones to control movement.
- ▶ Draw a map of your yard.
- ▶ Develop rules that apply to people and vehicles entering the yard to limit the risk of disease spread. This can include designated parking spots and a requirement to check with the house or office before entering the areas where livestock are kept.
- ▶ Identify the area where the pigs are housed. Develop specific rules that apply to how people, equipment and objects enter the “zone” where pigs are kept. Signs are helpful to restrict access.
- ▶ If housing pigs outdoors, an adequate fence (electric fencing works well as a perimeter fence) is needed to prevent contact with wild animals or other farm animals (cats and dogs).

Contain hazards if they occur

8. Sick pens

- ▶ Remove sick animals to an isolation pen. Provide access to feed and water.

Top 10 biosecurity tips

- ▶ Euthanize severely ill animals promptly.
 - Euthanasia by a veterinarian may not be an option for most farmers.
 - The person performing euthanasia must be experienced and confident.
 - Pigs under 5 kg or 3 weeks can be killed humanely by blunt trauma that destroys the brain.
 - Pigs over 3 weeks can be euthanized by captive bolt or gunshot.
 - Whenever possible, euthanasia should be performed where other livestock are not present.

9. Healthy to sick

- ▶ Always treat sick pigs after the healthy stock has been cared for. Do not return to the healthy pigs after caring for the sick pigs.
- ▶ Wear gloves and wash and disinfect boots and coveralls after treating sick animals.

10. Cleaning and disinfection

- ▶ For pigs housed indoors:
 - Pens should be cleaned between batches of pigs and the entire barn should be cleaned at least once per year.
 - Indoor cleaning includes scraping pens to remove bedding and feces, washing to remove all organic matter, applying a disinfectant, and allowing at least one day of drying and downtime.
 - In facilities that are difficult to wash, whitewashing is effective.
- ▶ For pigs housed outdoors:
 - Concrete pads should be scraped, washed and disinfected.
 - Lime can be added to dirt pens to kill pathogens.
 - Rotating pastures can help decrease pathogen load.

Top 10 tips for breeding stock

1. Start with healthy animals

- ▶ Purchase quality breeding stock from a reputable source and know the health status.
- ▶ Quarantine incoming pigs in the isolation area.
- ▶ Select gilts with sound legs (lameness is a major cause of culling sows), a normal vulva and at least 12 well-formed and evenly-spaced teats.
- ▶ Select boars with sound legs and good growth.

2. Preventive health

- ▶ Breeding stock should be treated for internal and external parasites every 6 months.
- ▶ Vaccination for parvovirus and erysipelas is strongly recommended. Many other vaccines are available. A vaccination program should be discussed with your veterinarian.
- ▶ Consult with your veterinarian regarding appropriate pain management if removing tusks from boars.

3. Feeding

- ▶ Body condition score all breeding animals on a regular basis (see page 31).
- ▶ Sows and boars should rate 3 on a 5 point scale and gilts should be 3.5.
- ▶ Boars and pregnant sows have a tendency to get too fat. The nutrient demands of pregnancy are not much higher than maintenance, so don't over-feed pregnant sows.
- ▶ Lactating sows tend to get too thin and this can increase the recovery time before the sow is cycling and ready to breed after farrowing. Feed a lactation diet that is high in energy to maintain the sow's body condition while nursing.
- ▶ See the section on "Failure to Breed" on page 29 for more details.

Top 10 Tips for breeding stock

4. Breeding

▶ Age

- Boars may begin breeding at 8 months but fertility will improve until 15 months.
- Gilts will begin to cycle between 160 to 180 days of age and when they weigh more than 100 kg.
- Mild stressors such as remixing or relocation can help bring on estrus (heat), as will contact with a mature boar.

▶ Estrus cycle

- Sows cycle (come into heat) every 21 days when not pregnant.
- Keep records of cycle dates to assist with breeding and pregnancy detection.

▶ Heat detection

- Gilts and sows are ready to be bred when they are in standing heat.
- This can be detected with slight pressure on their back when the female is in the presence of a boar.
- Standing heat will last between 36 to 60 hours.

▶ Breeding

- The actual breeding should be observed to ensure breeding records are accurate.
- Sows should be bred once every 24 hours while in standing heat.
- Gilts may be bred once every 12 hours because their standing heat is shorter.
- If using pen breeding, small groups (3 to 4) of cycling females can be penned with a boar. This works well if the cycles are not synchronized but it can be harder to predict farrowing dates.
- If the sows in a pen breeding group are all at the same stage of their cycle (all recently weaned litters) you may wish to rotate boars every 12 to 24 hours.

5. Detecting pregnancy

- ▶ Watch sows for return to heat at either 21 or 42 days after breeding.
- ▶ Pigs have a 111 to 114 day gestation period, so those that do not return to heat will have conceived at the previous heat, allowing you to predict the farrowing date.

6. Preparing for birth

- ▶ Know your breeding dates so you can prepare for farrowing.
- ▶ Move the sow to a farrowing area separate from other animals about 7 days before farrowing. This will give her a chance to settle in and feel comfortable. Begin feeding a lactation diet at this point. Sows benefit from higher fibre supplements before farrowing and may not eat much if they are carrying a big litter.
- ▶ If farrowing crates are not being used, provide loose straw to allow for natural nesting behavior which will begin 3 to 4 days before farrowing.
- ▶ Keep farrowing areas clean, dry and draft free. A warm creep area (>30°C) is important for neonates.

7. Birth

- ▶ Farrowing typically takes between 1 to 5 hours and piglets are usually born within 15 minutes of each other.
- ▶ See the section on “The Birth Process” on page 32 for more details.

Top 10 Tips for breeding stock

8. Managing neonates

- ▶ Piglets should be placed in a warm ($>30^{\circ}\text{C}$), dry, draft-free area immediately after birth.
- ▶ Every piglet should receive colostrum (first milk) within the first few hours of life, definitely within 12 hours.
- ▶ Each piglet requires a functioning teat and if there are not enough teats, fostering piglets or rotating them on the sow may be considered.

9. Piglet care

- ▶ Piglets must receive oral or injectable iron within 4 days of birth. Consult with your veterinarian regarding the best technique and proper pain management if you are castrating, tail docking or teeth clipping piglets.

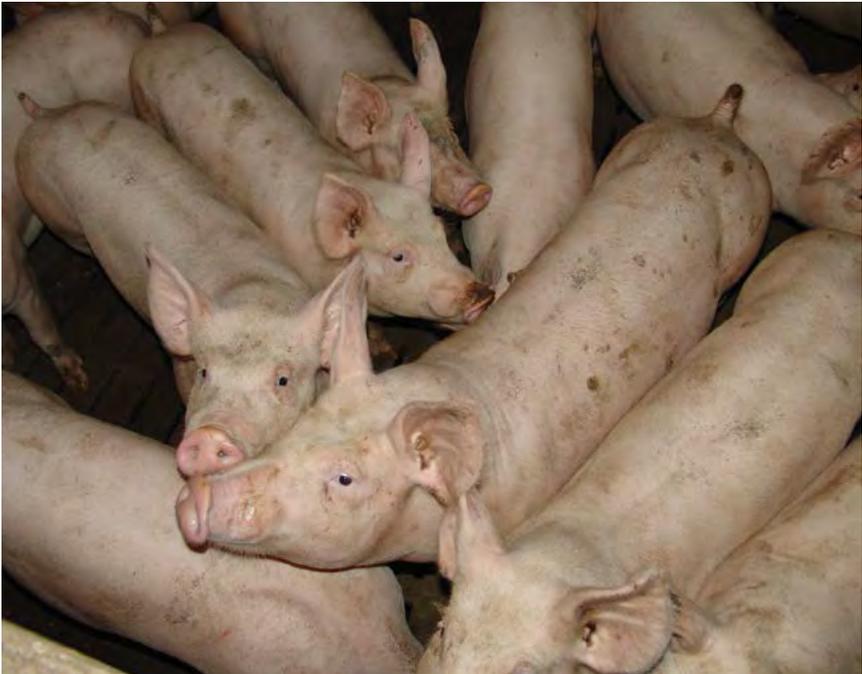


Photo credit: open source.

Top 10 Tips for breeding stock

10. Re-breeding

- ▶ Piglets can be weaned between 18 to 32 days, although they may be left with the sow for longer periods of time.
- ▶ Sows will return to heat 3 to 7 days after the litter is weaned.
- ▶ Ensure sows remain in good body condition throughout lactation.

Abortions, mummies, and stillbirths

What will I see?

- ▶ Early abortions (first 42 days of pregnancy) will be seen in sows that are cycling again (return to heat).
- ▶ Some sows fail to farrow and the abortion is not detected because sows eat the piglets and afterbirth.
- ▶ Sows with mid-term or late-term abortion may farrow a combination of dead and weak piglets. Piglets may appear normal or mummified.
- ▶ Sows infected with a viral disease during pregnancy may farrow at the normal time but have a high percentage of mummies, stillbirths or unviable piglets.

Commonly affected ages?

- ▶ Gilts or sows can be affected, regardless of how many times they have farrowed.
- ▶ Abortion may be more common in gilts, especially in unvaccinated herds.
- ▶ Sows can abort following any serious illness, especially if they had a severe fever.
- ▶ Sows may abort following trauma or fighting.

What should I do?

- ▶ Provide supportive care to the sow if she appears sick or injured. Sows that abort can develop infections of the uterus after abortion or can develop mastitis and should be monitored closely.
- ▶ Euthanize weak, deformed or severely premature piglets. They have little chance of survival.

Abortions, mummies and stillbirths

- ▶ While a single abortion may be an isolated event, if a second sow aborts, collect fetuses and placenta in a bag and keep them frozen until your veterinarian can examine them to determine the cause.
- ▶ Rebreed the sow on next heat. In most cases, an abortion will not have an effect on the future fertility of the sow.

How can I prevent it?

- ▶ Porcine parvovirus is the most important, preventable cause of infectious infertility in swine. There are vaccines available and your veterinarian can advise you on a vaccination protocol for gilts and sows to provide protection. Vaccination needs to be repeated.
- ▶ Vaccination for other infectious causes of abortion, including leptospirosis and Porcine Respiratory and Reproductive Syndrome virus (PRRSv), can be discussed with your veterinarian.



Aborted fetuses; those on the left are mummified. Photo credit: Steve Henry.

What else should I know?

Records are essential to understand reproductive performance and determine the cause of problems. Breeding records should include the boar used, dates and times of breeding, and returns to heat at 21 day intervals. Farrowing records should include the total number of piglets born, the number of viable piglets born, and the number weaned. This information is helpful to determine which sows to retain in the herd and supports selection of future breeding stock for high productivity.

It is normal for a low percentage (1 to 2%) of sows to have abortions or produce stillborn fetuses, including mummified fetuses. In small herds it can be very difficult to determine if abortions are within the normal range, which is why a single abortion may not require investigation but a second one in a small herd is worth looking into.

Failure to breed

What will I see?

- ▶ Young boars
 - Young boars may not know how to breed and should be bred with a mature, experienced sow the first time instead of a gilt. Never put a young boar with an aggressive sow.
 - A novice boar, especially one reared in relative isolation, may not be confident. It is important that boars are raised with pig contact so that they gain confidence as they mature.
 - Boars are ready to breed at 8 months but fertility continues to improve until 15 months.

- ▶ Mature boars
 - Old, lame or overweight boars may be unable or unwilling to mount females.
 - Overused boars (more than once per day or 4 times a week) will have reduced numbers of viable sperm.
 - Infertile boars will breed females but a high number of females will return to heat.
 - Boars may be infertile temporarily following illness due to fever.

- ▶ Gilts
 - Gilts are typically selected for breeding at around 100 kgs and should have a body condition score of 3.5 on a 5 point scale (see page 31).
 - Overweight or underweight gilts may not conceive.
 - Gilts may not conceive if bred on their first heat cycle and it is preferable to allow 2 cycles before breeding for the first time so they have matured.

Failure to breed

- ▶ Sows
 - Watch females at 21 day intervals after breeding to identify those returning to heat.
 - Sows weaned in poor body condition may fail to cycle or become pregnant. Lactation ration and duration can be adjusted to improve weaned sow body condition.

What should I do?

- ▶ If using controlled mating, ensure timing is correct. Mature sows should be bred every 24 hours during standing heat. Gilts can be bred every 12 hours.
- ▶ Ensure boars are not overused (no more than 1 breeding a day or 4 per week).
- ▶ Semen can be collected by hand and taken fresh to a veterinary clinic for examination to determine if sperm abnormalities are the cause of infertility.
- ▶ Cull infertile animals. Do not keep replacement stock from low-fertility animals.
- ▶ Cull lame sows and boars. They will be reluctant to breed and some causes of lameness are hereditary.

How can I prevent it?

- ▶ Keep animals in good body condition, but not overly fat.
- ▶ Vaccinate and treat breeding stock for internal and external parasites every 6 months.
- ▶ Isolate incoming stock for 30 days to prevent introduction of infectious disease.

What else should I know?

Know how to body condition score your pigs and keep records. Females should be scored 14 days after weaning, mid-gestation, 14 days before farrowing, and 14 days post-farrowing. Sows and boars should be kept at a body condition score of 3. Gilts should be slightly higher at 3.5.

Score	Description	What you will see	What to do
1	Excessively thin	Ribs, hips and backbone are easily seen and felt.	Increase feed significantly.
2	Moderately thin	Ribs, hips and backbone can be felt with slight pressure.	Increase feed moderately.
3	Ideal	Ribs, hips and backbone can be felt with firm pressure but cannot be seen.	Maintain feed amounts.
4	Moderately fat	Ribs, hips and backbone cannot be felt.	Consider reducing feed slightly.
5	Excessively fat	Ribs, hips and backbone cannot be felt and pig develops rotund body shape.	Reduce feed.

The birth process

What will I see?

- ▶ Normal farrowing
 - The sow/gilt will show some swelling of the vulva 3 to 4 days before farrowing.
 - She will show “nesting behaviour” within the last day before farrowing.
 - Within 24 hours of farrowing, the mammary glands will swell and milk may be expressed.
 - Piglets are born nose first (60%) or tail first (40%), typically within 10 to 15 minutes of each other. The last of the membranes are delivered within 4 hours of the final piglet.
 - Most sows and gilts deliver with no problems, though there may be a small number of piglets born dead.
 - Vaginal discharge that is clear to slightly cloudy or lightly blood-tinged for 2 to 3 days is normal.

- ▶ Failure to farrow
 - Prolonged gestation (more than 116 days) with the sow off feed and depressed.
 - Sow may have blood or foul discharge from vulva.

- ▶ Interrupted farrowing is a problem when there is:
 - Abdominal straining for more than 2 hours after only delivering 1 to 2 piglets.
 - Complete failure to strain and produce piglets after delivering only 1 to 2 piglets.

- Continuous abdominal straining for more than 30 minutes after the birth of a piglet but without producing more piglets.
 - Foul smelling uterine discharge or mucous discharge containing meconium (dark, tarry or orange blobs of feces from the fetus indicating fetal distress in the uterus).
- ▶ After farrowing
- Prolonged, excessive or foul-smelling discharge is not normal. These animals require antibiotics and you should contact your veterinarian for advice.
 - Monitor the udder closely for excess swelling or redness. If the sow is reluctant to allow piglets to nurse, she may have mastitis that will require antibiotic treatment.

Commonly affected ages?

- ▶ Gilts and very old sows are most likely to have difficulty.

What should I do?

- ▶ Most sows will remain on their side while you examine them but take care to ensure your safety and that the sow can be restrained before you attempt a vaginal exam.
- ▶ Wash the back end of the sow including the vulva and surrounding skin with warm water and a mild disinfectant soap.
- ▶ Apply a large amount of lubricant to your gloved hand before gently inserting it into the vulva to assist in delivering any easily accessible piglets.

The birth process

- ▶ If you have worked with your veterinarian in advance to learn how to use a piglet snare (pig puller device), this may be used to assist in the delivery of piglets. It can be less damaging to a small sow or gilt than manipulation by hand.
- ▶ If you have discussed the use of a product to induce contractions (such as oxytocin) with your veterinarian, you need to ensure that there is no piglet stuck or any other obstruction before giving these drugs. A vaginal exam is essential to be confident that failure to deliver piglets is from uterine inertia (exhaustion) and not a blockage or twist.
- ▶ Sows requiring substantial intervention and sows with foul smelling uterine discharge should be treated with antibiotics.

How can I prevent it?

- ▶ Cull sows that have had more than 7 litters and those that have had problems in the past.
- ▶ Select breeding stock from herds or genetic lines that have sound reproductive performance.

What else should I know?

It is very helpful to work with your veterinarian in advance. Once you have discussed options and have a management plan for farrowing in place, you could have your veterinarian prepare a farrowing kit for you. This can include disinfectant soap (such as Betadine®), obstetrical gloves and lubricant. In some cases it may include drugs (e.g. oxytocin) or a piglet snare (pig puller) to provide assistance during farrowing.

Neonatal death

Death of piglets before weaning is a major challenge for all swine producers. It is unrealistic to expect to wean 100% of the piglets born. Experienced producers recognize weak piglets that will not thrive and euthanize them immediately after birth. Commercial producers aim to wean 90% of piglets born alive, but every additional piglet weaned contributes to your financial bottom line.

Common problems

Failure of passive transfer

- ▶ Colostrum is the first milk. It contains the antibodies and immune cells that a piglet needs to be protected from infectious diseases in the first weeks of life. Every piglet needs colostrum within the first 12 hours. After 24 hours the piglet can no longer absorb the antibodies.

What can I do?

- ▶ Monitor piglets closely after farrowing and assist weak piglets to ensure they can suckle. If the litter is large, split it into two groups to ensure all piglets suckle.

Starvation

- ▶ After the first 2 days, piglets do not change teats at nursing. Be sure every piglet has a functioning teat. Piglets at the back of the sow will get less milk than those near the front.
- ▶ Death from starvation occurs most commonly 4 to 5 days after farrowing.

Neonatal death

What can I do?

- ▶ Foster piglets from large litters to another sow. This is easier if the foster piglets are a few days older than the litter they are going to. Piglets can be fed milk replacer if necessary although this may not be economical.
- ▶ Sows with mastitis (hot teats, fever, systemic illness) or other illnesses will require antibiotics and a whole litter may need to be weaned early. In this case, a milk replacer will be required if a foster sow is not available, and although piglets can be weaned early, it requires intensive care.

Trauma

- ▶ Cold, weak or dehydrated piglets will pile and cuddle with the sow for warmth. These piglets are at risk of being crushed.
- ▶ Splay-leg pigs are born unable to pull their legs under them and walk. These piglets often die from crushing or starvation, even with intensive care. Euthanasia should be considered immediately after birth.
- ▶ Sows may become agitated or aggressive during or shortly after farrowing. Sows may savage and kill piglets. Stress during farrowing should be kept to a minimum. Sows and especially gilts, should have plenty of time in the farrowing pen before their due date to become comfortable and confident in the area.

What can I do?

- ▶ The farrowing area should have a warm creep area (>30°C) to allow the piglets to be comfortable and out of the range of the sow. This will protect them from being crushed or savaged. This area must be fully washed, disinfected and dried between litters.

Umbilical infection (navel ill)

- ▶ The sow will typically consume the placenta (after-birth) and nip off the umbilical cord in the farrowing process. The umbilical cord contains blood vessels and while these typically constrict when the piglet is born, the area still remains susceptible to infection (navel ill).
- ▶ If bacteria infect the navel they can spread to other body organs and cause death or lead to chronic infections like arthritis and pneumonia.

What can I do?

- ▶ It is helpful to disinfect the umbilical stump (dip the navel) with an iodine solution (e.g. Betadine®) soon after birth. The stump will usually dry up and drop off, but the iodine helps prevent an infection from developing.
- ▶ Keep the farrowing area clean. Wash, disinfect and dry the area between litters.

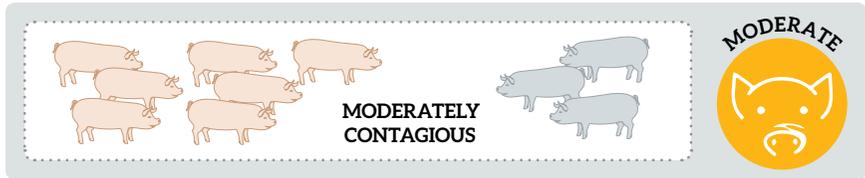
Lameness

- ▶ Infectious arthritis is common in neonatal pigs. Piglets are lame and will have one or more swollen joints. Infectious arthritis is worse in litters of piglets that do not receive adequate colostrum.

What can I do?

- ▶ Treat affected piglets with antibiotics.
- ▶ Keep the farrowing area clean. Wash, disinfect and dry the area between litters.

Acute pneumonia



What will I see?

- ▶ Pigs will be depressed, off feed and may separate themselves from the group.
- ▶ Breathing will be exaggerated or laboured and pigs may have a barking cough.
- ▶ Pigs will have a fever (rectal temperature $\geq 40^{\circ}\text{C}$) and may seek cool or damp areas of the pen to rest in away from their pen-mates.
- ▶ Pigs with red/blue belly or extremities (nose, ears, feet) require immediate care. Some pigs may be found dead.

Commonly affected ages?

- ▶ Can affect all ages of pigs, though illness is often most severe in younger pigs.
- ▶ Can be brought on by stress – particularly with mixing groups of pigs, or bad weather and storms.
- ▶ Acute pneumonia can spread rapidly through the herd.

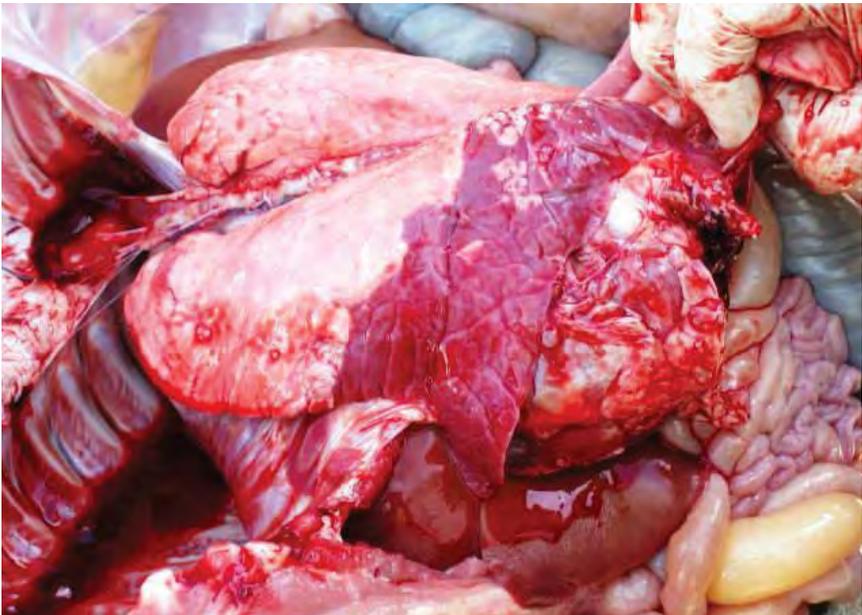
What should I do?

- ▶ Move affected pigs to an isolation pen to prevent spread of infection to other swine and to provide for optimal care.
- ▶ Provide a draft free area with free access to fresh food and clean water.

- ▶ Individual antibiotic treatment is needed for severe cases (definitely for any pig with red, blue or purple extremities).
- ▶ Group medication may be warranted if the disease is spreading between animals. Consult with your veterinarian to establish a treatment plan.

How can I prevent it?

- ▶ Minimize stress (see “Top 10 Swine Health Tips” on page 6).
- ▶ Provide adequate ventilation for pigs housed indoors to ensure good air quality. This includes controlling temperature, drafts, humidity and dust.
- ▶ Vaccines are available for common infections.



Lung with light pink normal areas and dark red, firm area with pneumonia.
Photo credit: Steve Henry.

What else should I know?

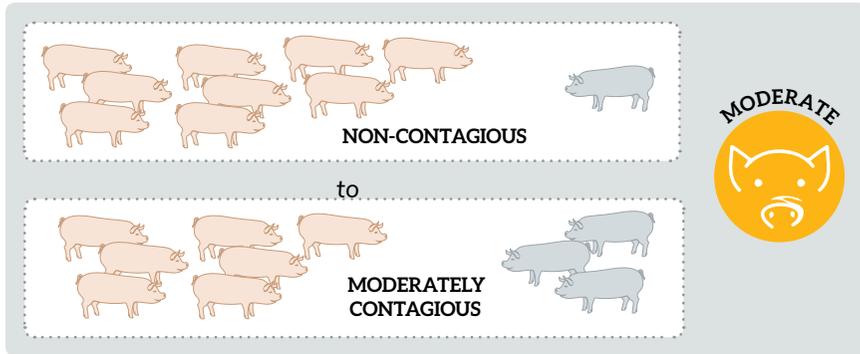
Common viruses that cause pneumonia in pigs are swine influenza virus (SIV) and Porcine Reproductive and Respiratory Syndrome virus (PRRSv). Pigs usually recover without treatment though the infection can spread to affect all pigs in the barn. Affected pigs are at increased risk of getting a secondary bacterial infection. If this occurs, the symptoms will worsen and you will need to consult with your veterinarian about antibiotic treatment.

Acute pneumonia can cause permanent damage to lungs. These pigs may breathe heavily and fail to gain weight like their pen-mates for the rest of their life. They may have adhesions in the chest cavity at slaughter.

Influenza viruses can be spread from people to pigs, as well as from pigs to people. Do not allow people with flu-like symptoms contact with pigs until 7 days after they are no longer ill.

Influenza viruses can also be spread between pigs and poultry or wild birds, so it is important not to house these species together, especially during winter months when influenza is more common.

Bloody feces



What will I see?

- ▶ Blood in the feces will be bright red if bleeding is near the end of the digestive tract (colon and rectum) and there may be streaks of blood in soft feces. This is suggestive of swine dysentery or a condition called proliferative enteritis.
- ▶ Blood in the feces will be black or tar-like if bleeding is from the stomach or upper intestine. This is most often caused by ulcers.
- ▶ Pigs may appear pale.
- ▶ Severe and sudden bleeding can cause sudden death – this is usually due to a stomach ulcer.
- ▶ When blood is accompanied by diarrhea or soft feces, it is more likely to be due to a bacterial infection.

Commonly affected ages?

- ▶ Grower pigs (8 to 12 weeks, 25 to 70 kg) and finisher pigs (3 to 6 months, less than 70 kg) are at highest risk.
- ▶ All ages can be affected.

What should I do?

- ▶ Move affected animals to an isolation pen. In some cases, bloody feces indicate infectious diarrhea and it is important to prevent it from spreading to other pigs.
- ▶ Use gloves and protective clothing (coveralls and boots) when treating affected pigs because some bacteria such as *Salmonella* can cause bloody feces in pigs and can also infect people.
- ▶ Observe affected animals closely to determine whether blood in feces is intermittent, consistent or getting worse.
- ▶ If bleeding gets worse or persists with diarrhea, consult a veterinarian for specific advice.
- ▶ If an affected pig dies, a veterinarian can perform a necropsy to confirm the cause.
- ▶ The treatment depends on the cause of bloody feces:
 - If ulcers – adjust feed management (see prevention below).
 - If infectious bacteria – treatment for other pigs that were exposed may be needed.

How can I prevent it?

- ▶ Ulcers
 - Provide consistent access to feed and avoid feed interruptions.
 - Don't feed finely ground rations. Ensure the particle size is a crumble or pellet.
 - Adjust diet to be lower in energy and higher in fibre if ulcers are occurring when pigs are given a concentrated, nutrient-dense ration.
- ▶ Infectious causes
 - Purchase pigs from herds negative for swine dysentery and proliferative enteritis.
 - Maintain good biosecurity.

What else should I know?

There are several causes of bloody feces. Stomach ulcers are common in feeder pigs. The cause is unknown but is linked to feeding practices. Ulcers form in the stomach and can erode into blood vessels. If small vessels are affected the feces are black and tarry and pigs are pale. If a large vessel is affected, the pig may be found dead with a pale carcass.

One of the most common causes of bloody diarrhea in grower and finisher pigs is swine dysentery, caused by bacteria (*Brachyspira hyodysenteriae*). Affected pigs have persistent diarrhea, often with some blood, and they grow poorly but this is not usually fatal. Swine dysentery can have a severe impact on growth rate and feed conversion, so is costly for pork producers. It can be controlled with antibiotics but is best prevented by ensuring pigs are purchased from herds that are free of the disease. If swine dysentery has been confirmed in your herd, a veterinarian can advise you on barn hygiene and pasture management to help prevent it from reoccurring.

Chronic diarrhea and wasting



What will I see?

- ▶ Pigs with fecal staining on hind-ends, feces on pen walls, wet litter and dirty pens.
- ▶ Diarrhea may contain mucus, blood, undigested feed particles or may range from loose, sloppy feces to watery diarrhea.
- ▶ Pigs may be dehydrated, and may be gaunt, slab-sided, have a rough coat and fail to gain weight.
- ▶ There are few deaths but if affected pigs are left with the group, more pigs will be affected.

Commonly affected ages?

- ▶ Those that have experienced diarrhea after stress, such as by transport, but fail to recover.
- ▶ Grower and finisher pigs (older than 8 weeks, and over 25 kg).

What should I do?

- ▶ Move affected pigs to an isolation pen for care and antibiotic treatment if only a few are affected. It may be possible to prevent spread to the rest of the herd if they are separated early enough.
- ▶ Clean the isolation pen to remove all feces and replace all bedding regularly to reduce the pathogen load in the pens.
- ▶ If many pigs are affected, your veterinarian may advise medicated feed or water, but a cure is not usually possible. Adding electrolytes

to the water may help treat dehydration.

- ▶ Early slaughter (as barbeque hogs rather than expecting full finishing weight) may be the most economical choice if weight gain and feed conversion are very poor.

How can I prevent it?

- ▶ Purchase pigs from source herds that do not have problems with chronic diarrhea.
- ▶ Avoid overcrowding or other sources of stress, especially when pigs are being brought onto the farm after being transported long distances.
- ▶ Provide newly arrived pigs with a ration similar to what they were receiving on the source farm to prevent digestive upsets.
- ▶ If raising pigs on pasture, consider rotating pasture. Following a bad year, adding lime to pens and pasture can help to kill pathogens to minimize the problem in future years.
- ▶ If raising pigs in barns or on concrete pads, washing and disinfecting are important. Barns that are hard to wash can be whitewashed with lime.
- ▶ Control rodents, birds and other animal contact. These animals can all spread disease between herds or from other livestock to pigs.

Chronic diarrhea and wasting



Pigs with chronic diarrhea are slab-sided and wasted compared with pen-mates. Photo credit: Steve Henry.

What else should I know?

Many different bacteria can cause chronic diarrhea, including some, such as *Salmonella*, that can infect people. While some can be controlled with antibiotics, few can be cured once the symptoms have progressed to wasting.

It is important to purchase stock from herds without a history of diarrhea in growing or finishing age pigs. Chronic diarrhea has been a re-emerging problem in commercial swine production in western Canada. Even if you have not had problems in the past, you want to avoid buying pigs from a problem herd so it is important to inquire about the health status of your source herd.

A new disease emerged in North America in 2014. Porcine epidemic diarrhea virus (PEDV) is related to the virus that causes transmissible gastroenteritis (TGE), and can affect pigs of all ages. These diseases are 100% fatal in suckling pigs and are less severe in older swine. If any pigs are vomiting these diseases should be suspected. Contact your veterinarian immediately.

Chronic pneumonia



What will I see?

- ▶ Pigs will have a persistent, hacking cough with or without heavy breathing.
- ▶ They will have a poor growth rate and remain smaller than pen-mates. They often have a rough coat.
- ▶ Some may be overtly sick and off feed with fever and depression.

Commonly affected ages?

- ▶ All ages of grower and finisher pigs.
- ▶ Can occur on its own or following a case of acute pneumonia.
- ▶ Uncommon in breeding stock or pigs less than 8 weeks old.

What should I do?

- ▶ Separate sick pigs to a warm, draft-free isolation pen with free access to feed and water. It is important to provide optimal conditions for these pigs; however, they may never fully recover or achieve ideal slaughter weight.
- ▶ Antibiotics can be effective early in the disease, but typically do not help chronic pneumonia.
- ▶ Pigs may be slaughtered at a lower final weight (barbeque hog size) if their rate of gain is not adequate. It is critical to observe the drug withdrawal time before slaughter if these animals have been treated with veterinary drugs.

How can I prevent it?

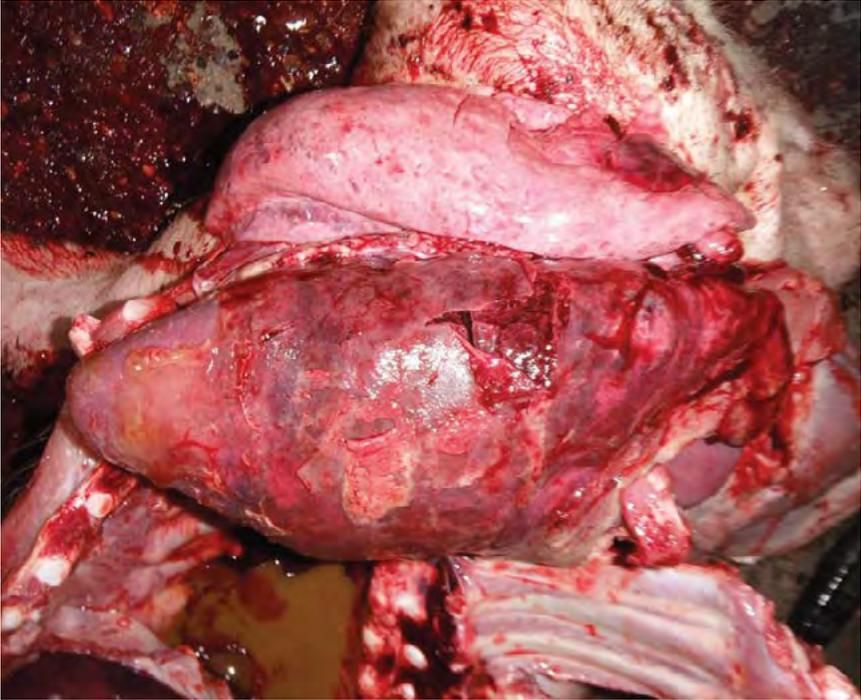
- ▶ Purchase pigs from herds that have not had problems with pneumonia, if possible from herds that are confirmed free of the bacteria *Mycoplasma*.
- ▶ Avoid overcrowding or mixing groups of pigs of different ages and sources.
- ▶ Mixing pigs of different ages on the farm creates a higher risk of pneumonia becoming a problem. It is better to obtain all pigs from a single source and slaughter all pigs each year rather than adding new feeder pigs to an already established group.
- ▶ Keep pig barns clean; control humidity and dust, especially from moldy bedding.
- ▶ Vaccines are available and your veterinarian can advise you on a vaccination program.
- ▶ Regularly deworm pigs as some parasites involve the lungs and can cause pneumonia.

What else should I know?

The most common cause of chronic pneumonia is *Mycoplasma hyopneumonia*. Many herds are either free of this disease or vaccinate for it, so ask about the status of pigs you are purchasing. Positive herds typically see a high incidence of illness but few deaths. The main loss is from poor feed efficiency and growth. Consider vaccinating pigs if you purchase from a positive herd.

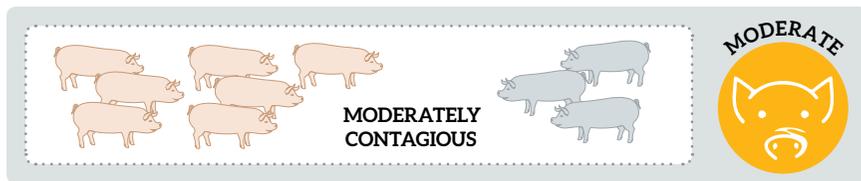
Chronic pneumonia can occur after viral pneumonia (swine influenza or PRRSv). These pigs often have substantial damage to the lungs and those that don't die have very poor growth rates.

Chronic pneumonia



The lung affected with chronic pneumonia is reddened and enlarged due to inflammation, with exudate on the surface. Photo credit: Frank Marshall.

Erysipelas (diamond skin disease)



What will I see?

- ▶ There are two forms of this disease – acute and chronic disease.
- ▶ Acute disease (septicemia)
 - Sudden death – pigs found dead.
 - Sudden onset of high fever, off feed, depressed pigs.
 - Red or blue skin on belly and ears.
 - A few animals may develop diamond-shaped, raised, red/purple skin lesions.
 - Animals are alert but do not want to stand because joints are too painful (shifting leg lameness).
- ▶ Chronic disease
 - Lameness with enlarged joints.
 - The typical diamond-shaped skin lesions may be present or in various stages of healing, so they will be crusty and not as red.

Commonly affected ages?

- ▶ All ages of swine are susceptible.
- ▶ Most pigs are vaccinated when they are nursery age. The immunity from the vaccine fades as pigs grow and may be lost before pigs are ready for slaughter, especially in herds with slower-growing pigs.

What should I do?

- ▶ Erysipelas can infect people. Always wear gloves and wash your hands after treating sick pigs.
- ▶ With acute illness, move affected pigs to an isolation pen. They require treatment with antibiotics and you should consult a veterinarian for advice on what drugs to use.
- ▶ Discuss with your veterinarian if antibiotics in the water are warranted to prevent spread to the rest of the herd.
- ▶ Pigs that have chronic illness can grow to slaughter weight but their growth will be slower and some affected joints or internal tissues may not be fit for human consumption and should be condemned.
- ▶ Any person developing fever, illness or skin lesions after working with sick pigs should seek medical treatment and let their doctor know if erysipelas has been present in their herd.

How can I prevent it?

- ▶ Ask if pigs you plan to purchase have been vaccinated and when. If pigs are expected to be on your farm for more than 180 days after vaccination, consider a single vaccine booster during the finishing period.
- ▶ If keeping breeding stock, all females should be vaccinated before each farrowing and piglets should be vaccinated in the nursery.
- ▶ Keep facilities clean and rotate pastures or pens.

Erysipelas (diamond skin disease)

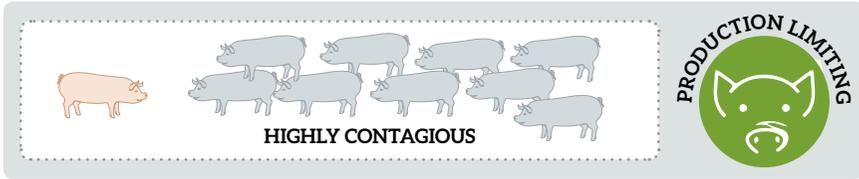


Erysipelas with classic diamond-shaped raised, red skin blotches.
Photo credit: Steve Henry.

What else should I know?

Erysipelas comes into your herd with healthy carriers. Sick pigs shed lots of bacteria that infect herd-mates and contaminate the barn and pastures. Soil contaminated by sick pigs may be infective to other pigs within the same year but is not infective year to year.

External parasites



What will I see?

- ▶ Itchy pigs that are rubbing and scratching and have loss of hair.
- ▶ The areas affected first are the inside of the ears, neck, jowl, flank and inner thighs.
- ▶ Signs spread to all pigs in a group or pen.
- ▶ Animals grow more slowly than expected because they are distracted by the irritation and don't eat or drink normally.
- ▶ If skin is damaged by rubbing, bacteria can cause a skin infection with crusty scabs.

Commonly affected ages?

- ▶ All ages of pigs can be affected.
- ▶ Skin parasites can only survive off the pigs for a few days, so parasite problems often occur when new pigs are brought into the herd.

What should I do?

- ▶ Treat all animals in the herd at the same time with an anti-parasite drug that is effective against skin parasites (ivermectin drug). Follow label directions to give the correct dose and ensure that the drug withdrawal period is over before pigs are slaughtered.
- ▶ It does not work to treat only the pigs showing signs because they will become re-infected.

How can I prevent it?

- ▶ Treat newly purchased pigs with an ivermectin product while they are in quarantine.
- ▶ Treat all pigs in the herd twice a year for routine parasite prevention.

What else should I know?

The mange mites and lice that affect pigs do not live on other livestock or on people. They will only persist for a short time in barns without pigs. Complete cleanout of barns between batches of pigs can help prevent mange mites and lice from reoccurring on a farm.

What else should I know?

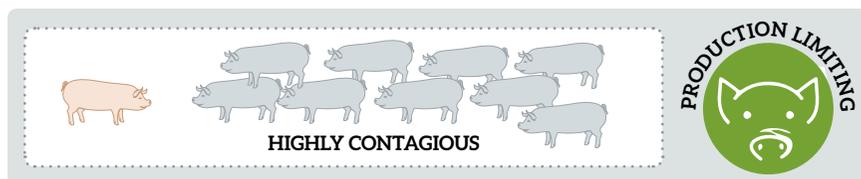
Pigs can get ringworm – a fungus causing brown, thickened rings on the skin. It can be spread from contact with other animals including cattle, cats and rodents. This fungus can spread to people and can survive in the barn but typically is not a severe problem for pigs.

Young pigs (less than 8 weeks old, under 20 kg) can get a disease called 'greasy pig'. Scabs start on the inner thighs and ears and can spread over the entire body. Greasy pig is caused by a bacterium, (*Staphylococcus hyicus*) that can spread to other piglets and may be fatal. Talk to your veterinarian about treatment.

Red, purple or blue skin on the belly, inner thighs and ears suggests severe infectious disease (septicemia) that requires immediate treatment. See sections on "Glässers Disease" on page 56, "Acute Pneumonia" on page 38 and "Erysipelas" on page 50.

Grower and finisher age pigs with extensive dark brown spots on their chest, belly, thighs and rump along with depression and severe weight loss may have a condition called porcine dermatitis and nephropathy syndrome (PDNS). The cause is not known but severely affected pigs are likely to deteriorate in this condition and should be euthanized.

Glässers disease



What will I see?

- ▶ Pigs are most often found dead without prior signs of illness.
- ▶ The brain is often affected and pigs show tremors, incoordination, hind-end weakness or paralysis.
- ▶ Some pigs may be off feed, depressed and have a fever.
- ▶ Swollen leg joints occur in some animals.
- ▶ Red/purple discolouration of the belly and extremities (nose, ears and feet) may occur.
- ▶ Few pigs are affected but a high percentage of sick pigs die.

Commonly affected ages?

- ▶ Pigs between 8 to 16 weeks are most often affected.
- ▶ If pigs carrying the bacteria that cause Glässers Disease are added to a herd that has never been exposed, pigs of any age can be affected.

What should I do?

- ▶ Move affected pigs to an isolation pen to provide nursing care and to prevent the disease from spreading to other pigs.
- ▶ Contact a veterinarian for treatment advice immediately.
- ▶ Injectable antibiotics are usually required. Treatment of both affected and unaffected pigs is recommended.

How can I prevent it?

- ▶ Ensure that you quarantine all newly purchased pigs to prevent exposure of pigs in your herd to this disease.
- ▶ Normal pigs can carry the bacteria that causes this disease and illness can be triggered by stress. See the “Avoid Stress” section under “Top 10 Swine Health Tips” on page 8.
- ▶ Severe disease occurs when a carrier animal is introduced into a herd that has never been exposed. If you are concerned, speak to your veterinarian about testing newly purchased animals to determine whether they are carriers.



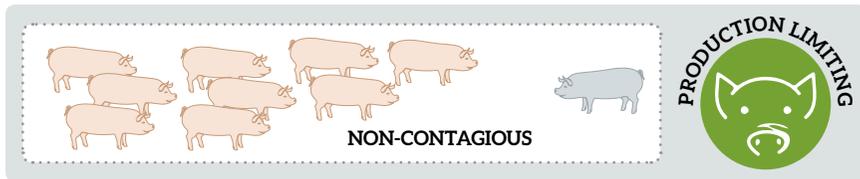
Internal organs coated with yellow exudate and fluid in the body cavities typical of Glässer's disease. Photo credit: Steve Henry.

What else should I know?

Glässers Disease is caused by a bacterium (*Haemophilus parasuis*). Pigs that survive may develop arthritis or chronic pneumonia. When they are slaughtered, the carcass may have adhesions in the chest and between loops of intestine in the abdomen that will make evisceration difficult and can contribute to contamination of the meat.

Another reason healthy pigs may die suddenly is from a twisted gut. You should suspect a twisted gut if a single animal is affected and new animals have not been brought into the herd recently. Pigs that have a twist in the gut are usually found dead with a very bloated abdomen that is a bruised purple-green color. The cause is unknown but may be due to feed interruptions or unusually increased activity in the herd.

Hernias (umbilical and inguinal)



What will I see?

- ▶ Pigs usually show no signs of illness other than swelling of skin forming a “pouch” in the affected area.
 - Umbilical hernia – a lump (1 to 30 cm diameter) in the middle of the belly (navel), especially in piglets that may have had an infection of the navel.
 - Inguinal/scrotal hernia – a lump on the hind-end well below the anus in male pigs.
- ▶ Large hernias may drag on the ground. The skin may develop sores that can become infected.
- ▶ Occasionally the bowel within the hernia can twist, causing severe pain leading to death.

Commonly affected ages?

- ▶ Inguinal/scrotal hernias can be present at birth.
- ▶ Hernias are often visible in suckling pigs (by 3 to 5 weeks of age) but enlarge as the pig grows.

Hernias (umbilical and inguinal)

What should I do?

- ▶ There is no practical treatment for affected pigs once a hernia has developed. The pig will often grow to slaughter size without problems.
- ▶ Pigs that show signs of severe pain or sudden swelling in the area of an existing hernia may have a section of the bowel twisted in the hernia sac or an infection. Treatment is not practical and these pigs should be euthanized.
- ▶ Take particular care at slaughter when cutting the skin in the area of a hernia to avoid cutting any loops of intestine that may be close to the skin surface which could contaminate the carcass.

How can I prevent it?

- ▶ Pigs can have a genetic predisposition to developing inguinal/ scrotal hernias. Inspect pigs carefully before purchase to avoid bringing this problem into your herd, especially if you are selecting breeding stock.
- ▶ Umbilical hernias are a result of navel infections or belly sucking in neonatal piglets. Proper piglet care including disinfection of the navel at birth can help prevent this.

Hernias (umbilical and inguinal)

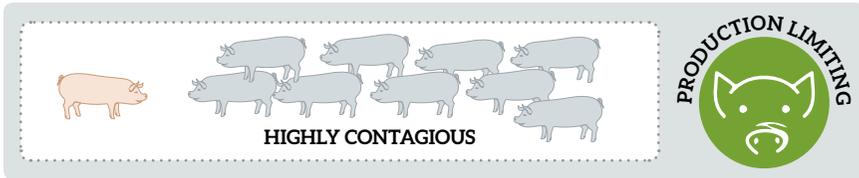


Large umbilical hernia formed at the navel opening that did not close completely at birth. Photo credit: Steve Henry.



Inguinal hernia with an expanded pouch of skin on one side of the scrotum in a castrated piglet. Photo credit: Steve Henry.

Internal parasites



What will I see?

- ▶ Pigs may carry intestinal parasites with no signs of illness.
- ▶ With a heavy parasite burden, pigs may have a rough hair coat, a pot-belly and fail to grow.
- ▶ Some pigs may develop a dry, persistent cough with or without trouble breathing.
- ▶ In severe cases, adult worms may be found in feces.
- ▶ At slaughter, white spots or scars may be noticed on the liver and large worms may be found in the intestines or smaller worms in the lungs.

Commonly affected ages?

- ▶ All ages of pigs can be affected.
- ▶ Growing pigs are more severely affected than breeding stock.

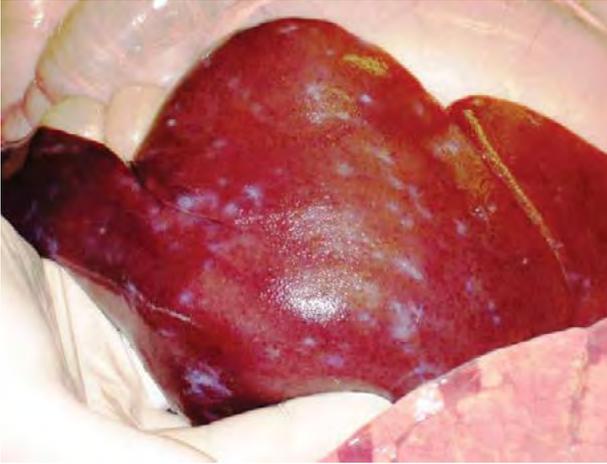
What should I do?

- ▶ Deworming medications can be used both for treatment and control.

How can I prevent it?

- ▶ Treat all pigs in the herd twice a year for routine parasite prevention.
- ▶ Treat pigs that are newly purchased while in quarantine and before they are introduced to the clean barns or pens.
- ▶ The products (ivermectin products) that are used to control external (skin) parasites are also effective against intestinal worms.
- ▶ You must follow label directions for treatment to give the correct dose and ensure that the drug withdrawal period is over before pigs are slaughtered.
- ▶ The eggs of intestinal worms may remain infective in soil for many years, so while pasture rotation can be helpful, deworming is recommended. Use pastures that are well drained.
- ▶ Herds with breeding stock should deworm sows 1 to 2 weeks prior to farrowing.

Internal parasites



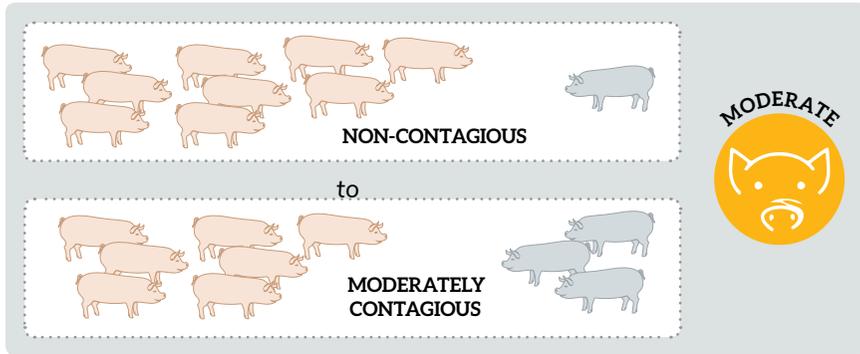
Liver condemned due to white spots from parasite migration.
Photo credit: Steve Henry.

What else should I know?

Intestinal parasites are present as an adult worm in the gut of pigs. The adult worms produce eggs that are passed in the feces of the pig. These eggs are very resistant to environmental conditions such as freezing and sunlight and have the potential to infect pigs for years after they are passed in feces.

These parasites are not a risk to human health.

Lameness



What will I see?

- ▶ Symptoms (from mild to severe):
 - Unwilling to stand, move, or go to feed and water.
 - Stiff gait when the animal does move.
 - Swelling of joints – the skin may be reddened and hot.
 - Toe tapping or carrying the leg.
- ▶ Infectious lameness affects multiple animals and often follows other symptoms such as pneumonia, fever or off-feed.
- ▶ Non-infectious lameness usually affects a single animal and a single leg.

Commonly affected ages?

- ▶ Young, growing pigs are more prone to infectious lameness.
- ▶ Pigs over 50 kg are more prone to non-infectious lameness.

What should I do?

- ▶ Move affected animals to an isolation pen to prevent them from being harassed by pen-mates and to allow for easier treatment.

Lameness

- ▶ Ensure food, water and shelter is easily accessed.
- ▶ If joints are swollen, hot and red with a sudden onset of lameness, it is likely a bacterial infection. Consult a veterinarian for advice on treatment. Antibiotics and pain medication may be helpful, though joint infections can be hard to treat unless caught very early.
- ▶ Lameness that is not infectious is often due to abnormal bone or joint development that becomes apparent as the pig grows. These pigs can be managed to slaughter weight, but may require isolation to reduce competition from pen-mates. You may discuss pain control with your veterinarian. Affected pigs should not be selected for breeding.
- ▶ Severely lame pigs that do not respond to treatment should be euthanized.

How can I prevent it?

- ▶ Infectious lameness may result from navel infections, so ensure farrowing areas are clean and newborn piglets have proper care for the umbilicus (navel).
- ▶ Non-infectious lameness can be caused by fighting, trauma, or degenerative arthritis so good management will help prevent this.
- ▶ Avoid mixing and overcrowding pigs.
- ▶ Genetics is a factor in non-infectious lameness. If you experience a problem, consider buying pigs from another source in the future. Select only sound animals with good conformation as breeding stock.



Severely swollen knee joint causing lameness. Photo credit: Steve Henry.

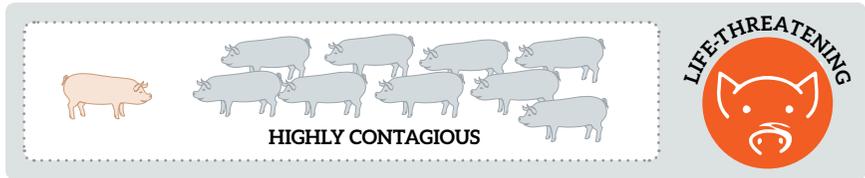
What else should I know?

Most infections that cause lameness involve other body systems and may spread from the navel in very young piglets or be an extension of a generalized infection. Multiple joints may be affected. For more details see the sections on “Septicemia (after transport)” on page 76, “Erysipelas” on page 50 and “Glässers Disease” on page 56.

Mycoplasma hyosynovia and *Mycoplasma hyorhinitis* are bacteria that specifically cause lameness with few other clinical signs. These bacteria affect pigs from 3 to 10 weeks and 8 to 24 weeks of age respectively.

Rickets is due to nutritional deficiencies and affects bone growth. Herds with lame, stunted or short pigs or a high incidence of broken bones need to consider whether their ration is balanced. The need for correct supplementation is particularly important in any herds fed a homemade diet.

Neonatal diarrhea



What will I see?

- ▶ Diarrhea can range from pasty to watery to bloody and there may be sudden death without diarrhea – dead piglets look very gaunt.
- ▶ Piglets become thin, have a rough hair coat, and may show a wet or stained back end.
- ▶ In severe cases, piglets become weak and dehydrated (gaunt, rough hair coat sunken dull eyes) within days.
- ▶ All **diarrhea** is serious in neonatal pigs (less than 2 weeks) and many pigs will die without treatment.
- ▶ If pigs (piglets or the sows) are **vomiting** contact your veterinarian immediately. The infections that cause vomiting can spread rapidly between piglets and between litters.

Commonly affected ages?

- ▶ All ages of suckling piglets (birth to 4 weeks) are susceptible.
 - The age of piglets when diarrhea is first seen should be noted because this can help your veterinarian determine the most likely cause.
- ▶ Death losses and severity are usually lower when piglets are over 10 days of age.

What should I do?

- ▶ Keep the farrowing area clean, warm and dry. Change straw or other bedding regularly and keep the piglet area very clean.
- ▶ Provide piglets with protection from the sow – a ‘creep area’ that she cannot get into where they have warmth and a clean comfortable surface to rest. Weak and dehydrated piglets that might survive diarrhea can die from being laid on by the sow.
- ▶ Provide electrolytes in water to treat dehydration in older piglets with diarrhea.
- ▶ A veterinarian can advise about drug treatment but in many cases the cause of diarrhea is a virus and antibiotics do not help.

How can I prevent it?

- ▶ Ensure all piglets have nursed within 12 hours of birth to benefit from colostrum (first milk) that contains protective proteins from the sow.
- ▶ The farrowing area should be washed, disinfected and allowed to dry between litters.
- ▶ Consider the area where affected piglets are (farrowing or nursing pen) to be an isolation area. Wear rubber gloves, coveralls and boots that are only used with piglets with diarrhea. Clean, disinfect and launder these regularly.
- ▶ Work with healthy piglets and sows before treating litters with diarrhea to avoid spreading it to healthy litters.
- ▶ Vaccines are available for sows to improve the quality of colostrum in herds with ongoing problems.
- ▶ Farms with recurring problems may wash sows prior to putting them in the farrowing area.

Neonatal diarrhea



Piglets with diarrhea have feces on their hind-end and are dehydrated and gaunt. Photo credit: Steve Henry.

What else should I know?

Diarrhea is very contagious and easily spread in feces of affected piglets and sows. It is essential to keep litters separate and to disinfect tools between treating different litters. Needles for iron injections, tooth nippers and scalpels for castration, as well as any surfaces where piglets are handled, must be cleaned and disinfected to prevent the spread of bacteria or viruses.

Nutritional deficiencies or toxicities



What will I see?

- ▶ Deficiencies are uncommon in herds fed a commercial diet.
 - Symptoms can vary widely and depend on the deficiency.
 - Vitamin E/selenium deficiency causes sudden death in pigs up to 4 months.
 - Calcium/phosphorus and vitamin D imbalance causes rickets in growing pigs, which presents as swollen joints and lameness.
 - Iron deficiency will occur in piglets that are not given iron at birth, since all piglets are born with inadequate iron and milk is not a good source. Affected pigs have anemia (low numbers of red blood cells).
- ▶ Mycotoxins are toxins produced by fungus that can grow in grain and contaminate feed. Mycotoxins can be common in southern Canada in certain years. If you feed a manufactured ration and suspect mycotoxin may be a problem, you should discuss the source of grain and the screening program used with your feed mill. Mycotoxins can cause:
 - Decreased growth and feed efficiency.
 - Increased susceptibility to other diseases.
 - Neurological signs, lameness, or diarrhea and vomiting.

Commonly affected ages?

- ▶ All ages of pigs can be affected.
- ▶ Younger pigs are often more susceptible than finisher or adult pigs.
- ▶ Multiple pigs will usually be affected and the signs of illness will tend to occur at the same time, but often weeks after a change in the feed.

What should I do?

- ▶ Keep records of your feed source, batch and dates that feeds were changed. This will be useful if any illness develops to confirm when pigs were exposed to an improperly formulated or contaminated feed.
- ▶ When symptoms appear that you suspect may be related to the feed, replace the feed. Keep samples of the old feed and any feed records or labels for testing.

How can I prevent it?

- ▶ Prevent deficiencies by using a balanced, commercial feed that is formulated for the stage of production of your pigs (weaner, grower, finisher or breeding stock).
- ▶ You should test ingredients and carefully calculate the required supplement levels if you are formulating a home ration to ensure it is balanced.

What else should I know?

Iron deficiency is not a nutritional deficiency but is a management disease. All baby piglets require iron at birth. Without iron, piglets become very anemic and pale. Symptoms become obvious around the time of weaning. This problem could still be apparent in newly arrived pigs. Iron deficient pigs are notably pale compared to their pen-mates. They respond quickly after receiving injectable iron.

Tiamulin is a common antibiotic in nursery diets and is often used to control swine diseases such as swine dysentery. Monensin is a common anti-parasite drug added to cattle and poultry diets. Pigs will die if fed the **combination** of tiamulin **and** monensin. Mixed farms feeding diets with these ingredients must be very careful to not allow pigs access to cattle or poultry feed.

Rectal prolapse



What will I see?

- ▶ A red protrusion from the anus with blood on the hind-end.
- ▶ Pen-mates will bite or chew on the prolapse and may cause more of the rectum to prolapse.
- ▶ Prolapses left unattended can become dry, black and fall off.
- ▶ Surviving pigs may develop a scar around the anus (anal stricture) that will make defecating difficult or impossible. The colon fills up with feces and the pig develops a very large belly while the rest of the animal wastes away.

Commonly affected ages?

- ▶ Finisher pigs (older than 12 weeks and over 70 kg).

What should I do?

- ▶ Separate affected pigs from pen-mates as soon as signs are seen.
- ▶ Attempt to gently replace prolapsed tissue in mild cases. Over-the-counter hemorrhoid treatment cream may reduce swelling and irritation and make it easier to replace the prolapse.
- ▶ Consult with a veterinarian for proper antibiotic treatment, pain medication and/or amputation in severe cases.
- ▶ Monitor for anal stricture – these pigs must be euthanized and the carcass is condemned.

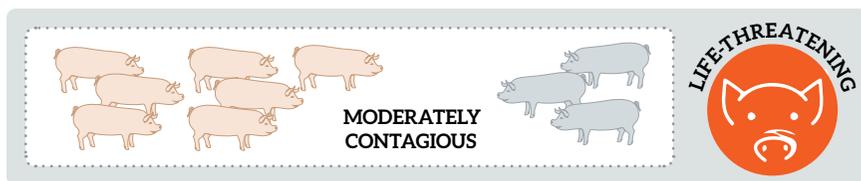
How can I prevent it?

- ▶ Avoid cold, drafts and/or transport stress that will cause pigs to lie in piles increasing pressure on the belly.
- ▶ Treat diarrhea promptly as straining and irritation can lead to prolapses.
- ▶ Treat respiratory disease promptly as coughing can lead to prolapses.
- ▶ Avoid feeding whey, brewer's grain or low fibre diets that may predispose pigs to prolapses.



Prolapsed rectum extending from the anus below the tail.
Photo credit: Steve Henry.

Septicemia (after transport)



What will I see?

- ▶ Pigs may be found dead with no signs of illness.
- ▶ Acutely affected piglets have a fever, go off feed, appear depressed and may show lameness or unwillingness to move.
- ▶ Pigs may have red/purple bellies or extremities (nose, ears and feet).
- ▶ Some pigs may lie on their side and paddle their legs. Less severely affected pigs may be dizzy, convulse or appear blind.
- ▶ Pigs that survive the initial illness can develop lameness with multiple swollen joints.
- ▶ Some survivors develop pneumonia that typically makes it hard for them to exhale and they will show abdominal effort in breathing.

Commonly affected ages?

- ▶ Septicemia is most common in pigs between 3 to 8 weeks of age.
- ▶ Stress from transportation may cause disease in newly arrived pigs of any age.

What should I do?

- ▶ Move affected pigs to an isolation pen to reduce stress from competition with pen-mates and provide optimal care.
- ▶ Pigs will require antibiotics, and anti-inflammatory drugs are helpful. Consult a veterinarian for advice if you suspect septicemia.

- ▶ Provide affected pigs with feed mash and water containing electrolytes.
- ▶ If multiple pigs in a group are affected, discuss preventive medication for the rest of the herd with your veterinarian.

How can I prevent it?

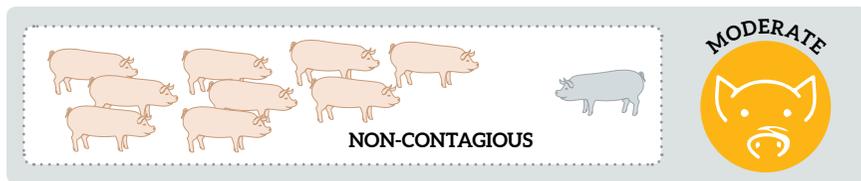
- ▶ Minimize stress – see the “Avoid Stress” section under “Top 10 Swine Health Tips” on page 8.
- ▶ Provide pigs with a warm and draft free environment. If raising pigs indoors, control humidity by providing ventilation. Even in cold temperatures, it is critical to have sufficient ventilation in barns to ensure humidity does not become too high. Litter should be dry and absorbent.
- ▶ Place newly arrived pigs into a clean environment. Wash and disinfect barns between batches of pigs.

What else should I know?

While many different bacteria can cause septicemia, *Streptococcus suis* is one of the most common and important pathogens in commercial swine production. Although most pigs transported to the Yukon are past the highest risk period for *Strep. suis*, the stress of transportation could be enough to cause illness. This bacterium is present in virtually all herds, so you cannot eliminate the chance of bringing it into your herd when you buy pigs, but you can reduce the chance and potential severity of disease by providing optimal management and care for your pigs.

Other bacteria including *Haemophilus parasuis* and *Actinobacillus suis* can cause very similar illness. These bacteria require different antibiotics from *Strep. suis*. It is important to consult with your veterinarian if pigs are not responding to medication as expected.

Trauma and bite injuries



What will I see?

- ▶ Bite and scratch marks especially on the face, ears and tail.
- ▶ Abscesses (swollen, hot areas that may appear fluid-filled) can develop and can extend to joints, causing lameness.
- ▶ Young pigs may develop swollen ears from bleeding under the skin (aural hematoma).
 - These do not require treatment and will resolve on their own.
 - Healed ears may be thick and deformed.
- ▶ Tail biting and chewing can range from a mild scratch to the entire tail being chewed off.

Commonly affected ages?

- ▶ Any age of pig can be affected.
 - Weaner pigs (3 to 12 weeks) are prone to aural hematomas.
 - Grower and finisher pigs (3 to 6 months) are prone to tail biting.
 - Breeding females are prone to biting pen-mates. Sows can develop strong and persistent aggression toward other pigs and may never tolerate being housed together with another pig they dislike.

- Boars (intact breeding males) will fight with each other and may be aggressive toward sows. Sows may be aggressive toward boars when not in standing heat.
- ▶ Most common after mixing groups, especially with overcrowding or as a result of boredom.

What should I do?

- ▶ Separate pigs into smaller groups if aggression is occurring.
- ▶ Pigs are attracted to blood. Place any pig with a bloody wound in an isolation pen until completely healed.
- ▶ Look for pigs with blood on their face. Remove from the pen because they are often the attacker.
- ▶ Pigs with severe wounds may require antibiotics to prevent infection.
- ▶ Providing fresh bedding and increasing available feeder or water trough space may reduce conflict.

How can I prevent it?

- ▶ Provide sufficient space and ensure adequate access to feed and water for every animal.
- ▶ Monitor animals closely, especially after mixing groups. Pigs that have grown up together may be very aggressive to new introductions to the group.
- ▶ Provide distractions such as large hard rubber balls or tires suspended on ropes that pigs cannot destroy but can manipulate.

Trauma and bite injuries

- ▶ Docking tails at birth or purchasing pigs with docked tails for potential breeding stock will reduce the risk of severe problems that can occur from tail biting in valuable sows. It also reduces the effectiveness of tail signals that are an important way that pigs communicate.
- ▶ Avoid using ear tags that may be a trigger point to encourage ear chewing in piglets.

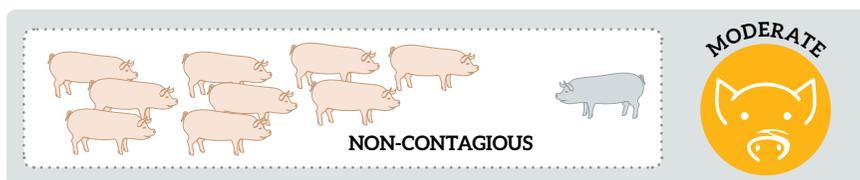


Tail biting that varies from partly healed scabs on tails to complete loss of the tail and surrounding tissue.
Photo credit: Steve Henry.

What else should I know?

Tail chewing is common and the damage that is inflicted can be severe. Antibiotic treatment is necessary if there is a large open wound. Some pigs will develop abscesses from bacteria entering the blood stream through the tail wound. This can cause lameness in pigs and if several joints are affected the carcass should be condemned at slaughter.

Water deprivation



What will I see?

- ▶ Pigs may be thirsty or constipated, but this phase of illness is very brief.
- ▶ If water deprivation continues, pigs stop eating and responding – they act blind and deaf, and may walk in circles or bump into objects.
- ▶ Pigs will have seizures that begin with the pig sitting like a dog, then extending its chin to sky, then falling over in a seizure.
- ▶ Most of the severely affected pigs die within 2 days.

Commonly affected ages?

- ▶ Can affect pigs of any age.
- ▶ Recently weaned pigs are more sensitive than older growing animals or adults.

What should I do?

- ▶ Remove any food or water that is high in salt.
- ▶ Provide fresh water – initially in small amounts at frequent intervals if the pig will still drink.
- ▶ Pigs that are seizing or are in a coma should be euthanized because they have a poor chance of recovery.

How can I prevent it?

- ▶ Ensure there is a consistent supply of fresh water and ensure it is not frozen in winter.
- ▶ If using an electrically heated water bowl, ensure there is proper grounding to prevent electrical shock (stray voltage) that will deter animals from drinking.

What else should I know?

Salt poisoning, caused by water deprivation, is a preventable cause of neurological symptoms in pigs. If pigs show these signs, it is critical to check the water source. Stray voltage or some types of contamination of the water may cause pigs to avoid drinking.

Meningitis (an infection around the brain) can look like water deprivation but fewer pigs will be affected and there will be other signs of illness. Meningitis is caused by bacteria such as *Streptococcus suis* and *Haemophilus parasuis* (see the sections on “Septicemia (after transport)” on page 76, and “Glässers Disease” on page 56).

Heavy metal toxins (including lead and arsenic) can also cause neurological signs. Pens and barns should be checked for garbage, batteries or other debris that may cause pigs to get sick.

Although rabies has not been diagnosed in Yukon in decades, pigs can get this virus that affects the brain of all mammals, including humans. It is important to ensure that wildlife such as foxes are not in contact with your livestock and any wildlife showing abnormal behaviour is reported to a Conservation Officer.

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Yukon