SECTION 7: SWINE HEALTH

This section will review swine diseases, government regulated foreign animal diseases, and how to keep your herd healthy.

7.1 HERD HEALTH

The concept of "herd health" generally refers to preventative group health and disease management. Depending on your farm goals, you may be raising 1 pig, a dozen pigs, or over 100 pigs. Regardless of how many pigs you are raising, it is useful to know how to keep a herd healthy.

The principles of keeping a herd healthy can be compared to keeping kids healthy at school:

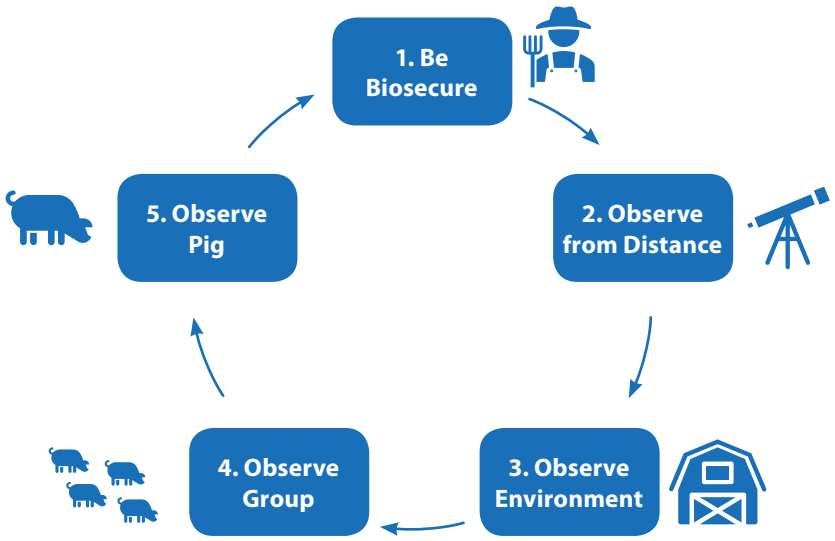
CONCEPT	SCHOOL EXAMPLE
Disease prevention	*E.g., Vaccinating school age kids.*
Disease containment	*E.g., Keeping a sick kid home from school.*
Treating a group for contagious diseases	*E.g., When one kid brings head-lice to school, treat everybody.*
Observing and reacting to disease dynamics	*E.g., Observing a flu-like bug going through school and implementing hand-sanitizer and wearing masks.*

Consult with your veterinarian to create a herd health program, which usually include:

- Vaccination and deworming protocols,
- Biosecurity protocols,
- Individual pig treatment protocols,
- Group treatment protocols,
- Farrowing and breeding protocols, and
- Euthanasia protocols.

7.2 HERD HEALTH EXAM

When checking your herd (**every day**), observe the big picture and focus on smaller individual details. It is a good idea to ***make a check list, make it routine, and do it every day*** to prevent missing something important. Here is a suggested check list:



1. BE BIOSECURE

- Follow biosecurity protocols prior to entering pig facilities (e.g., wear appropriate personal protective equipment (PPE), change clothing, change boots, enter **Restricted Access Zone (RAZ)** properly) (See Section 8: BIOSECURITY)

2. OBSERVE FROM DISTANCE

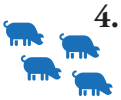
- Before stepping into pens, **STOP**. Look, listen, smell, and note anything unusual. Get to know your pigs, learn what is "normal" for them day-to-day. Get to know your barn, learn what are "normal" smells and sounds day-to-day. For example:
  - What are pigs doing?
  - Are they sleeping and relaxed? *(A good sign)*
  - Are they fighting? *(Maybe they are picking on a new pig)*
  - Are they screaming at the feeders? *(Maybe you were late feeding today)*
  - Do they react to your presence? *(Listlessness could indicate onset of sickness)*
  - Do they get up and interact with you? *(They should)*
  - Is there a strange odour? *(Maybe a result of poor ventilation)*
  - Does it smell sour or rancid? *(There may be a diarrhea spell)*

- Does it smell unusual? *(There could be a dead pig)*
- Do you smell smoke? *(This could be an emergency)*
- Do you eyes burn in the pens? *(This could indicate too much ammonia gas)*
- Do you hear anything new? *(Squealing piglets might indicate non-nursing sow)*
- Do you hear coughing? Sneezing? *(Your pigs might be getting sick)*
- Do you hear equipment malfunction? *(You better check on this)*

3. OBSERVE ENVIRONMENT

- Feed: Check feeders.
  - Is feed available? Is feed fresh? Are pigs eating? Is there leftover feed?
- Water: Check water.
  - Is water available? Are troughs frozen over? Is water fresh? Are pigs drinking?
- Air: Check ventilation.
  - If indoors, is it humid? Are your eyes burning? Do you smell ammonia? Is there good air flow? Are there any drafts?
- Temperature: Check temperature.
  - Are piglet heat lamps on and working? If outside, do pigs have access to shelter, bedding and wallowing to protect them from cold or heat?
- Hygiene: Check for cleanliness.
  - Are pens clean? Is bedding soiled? Are there excess flies? Is there evidence of a rodent problem?

4. OBSERVE GROUP



- Get every single pig up every single day.
- Observe the group.
  - Is there a pig who behaves or looks different from the group?
- Observe surroundings.
  - Are there any signs of vomit, diarrhea, blood, or distress from the group?

5. OBSERVE PIGS

- Observe every pig's behaviour.
  - Are they behaving like others?
  - Are they getting up?
  - Are they dull, depressed, or hanging their head low?
  - Are they eating?

- Watch every pig walk.
  - Are they limping?
  - Can they get up OK?

- Watch every pig breath.
  - Are they open mouth breathing?
  - Are they panting?
  - Are they struggling?

- Observe every pig's body condition score.
  - Are they underweight or overweight?

- Look at every pig head to tail.
  - Eyes, ears, nose, mouth: look for discharge, lesions, blood, swelling.
  - Skin/body: look for lumps, bumps, scratches, abscesses, hernias, wounds, hair growth.
  - Limbs: look for swellings, redness, bumps, symmetry.
  - Hind end: look for diarrhea staining, prolapses, tail biting.

*****Don't forget to write down what you find*****

7.3 PIGS – IDENTIFYING NORMAL VS. ABNORMAL

Consider both **BEHAVIOURAL SIGNS** and **CLINICAL SIGNS** when evaluating "Normal" vs. "Abnormal" pigs. Ask yourself:

BEHAVIOUR: WHAT is my pig doing?

ACTIVITY	NORMAL BEHAVIOUR	ABNORMAL BEHAVIOUR
Lying Down	• Main group of pigs will sleep together touching, but some pigs will be spread out to maximize contact with the floor. • Separated pigs are more dominant. • Pigs sleep on side with legs stretched out from the body. • Lay down mostly throughout the night. • Up and down throughout the daytime.	TOO COLD • Piling on top of each other, shivering, tucking limbs under the body, lay near corner or wall, do not want to get up. TOO HOT • Panting (over 40 breaths per minute), NOT lying with other pigs, digging, laying in cold mud or in wet areas, do not want to get up.
Getting Up	• Pigs should get up when greeted. • Pigs should stand up without struggling or vocalizing. • Pigs should be curious to your presence. • Larger pigs may be slower or lazy to stand up and need more encouragement.	• Vocalizing when standing. • Shaking when standing. • Refuse to get up. • Obvious red marks on skin where animal was sitting or laying (this may indicate the animal has not gotten up in awhile).
Vocalizing	• Grunting and barking are normal greeting sounds. • You may hear squealing when pigs are playing or arguing with one another.	• High-pitched screaming. • Honking cough, raspy coughing, sneezing.
Defecating/ Urinating	• Pigs will defecate in a specific area of the environment. • This will often be where it is cold, dark, wet, where a draft is, or where it is private. • Pigs will stand up and defecate/urinate multiple times a day.	• Defecating and urinating all over the pen can indicate something is wrong. • Pigs with diarrhea often cannot make it to the "toilet area" and will go anywhere. • Bloody diarrhea is not normal.
Exercise	• Pigs will get up and down to walk around throughout the day. • Younger and lighter pigs will run more. • Heavier pigs will be lazier.	• No interest in getting up. • Avoiding other pigs. • Laying alone.
Play	• Pigs are very playful animals and love to explore the environment. • Pigs will chew on everything. • Pigs will bite at each other when playing. • Pigs play rough, but should not seriously injure each other.	• Tail-biting, flank-biting, or ear-biting other pigs. • This can indicate something is wrong with the health or environment of your pigs. • Group of pigs attacking one pig.

7.3 PIGS – IDENTIFYING NORMAL VS. ABNORMAL

ACTIVITY	NORMAL BEHAVIOUR	ABNORMAL BEHAVIOUR
Eating	• Every pig should be eager to eat. • If you have feed available 24/7, pigs will be up and down at the feeder all day. • If you have a feeding schedule, pigs will consume all of their feed in one sitting. • Dominant pigs push their way to feeder first – have enough feeder space!	• Not eating – a pig off feed is very unusual and must be checked. • If you have one pig off-feed, this pig may be sick. • If you have multiple pigs off-feed, your feed may be bad, or this could be the onset of a disease condition.
Drinking	• Pigs will drink about 10% of their body weight per day. • Pigs may play with water drinkers or water troughs especially if it is hot out. • Make sure you have freshwater access 24/7.	• A lack of water on a hot day is enough to kill pigs. ALWAYS have water available. • In the unfortunate event of a water outage, pigs may display abnormal neurological behaviour. Contact your vet ASAP for instructions if this happens (introducing water rapidly after being dehydrated can cause major problems).

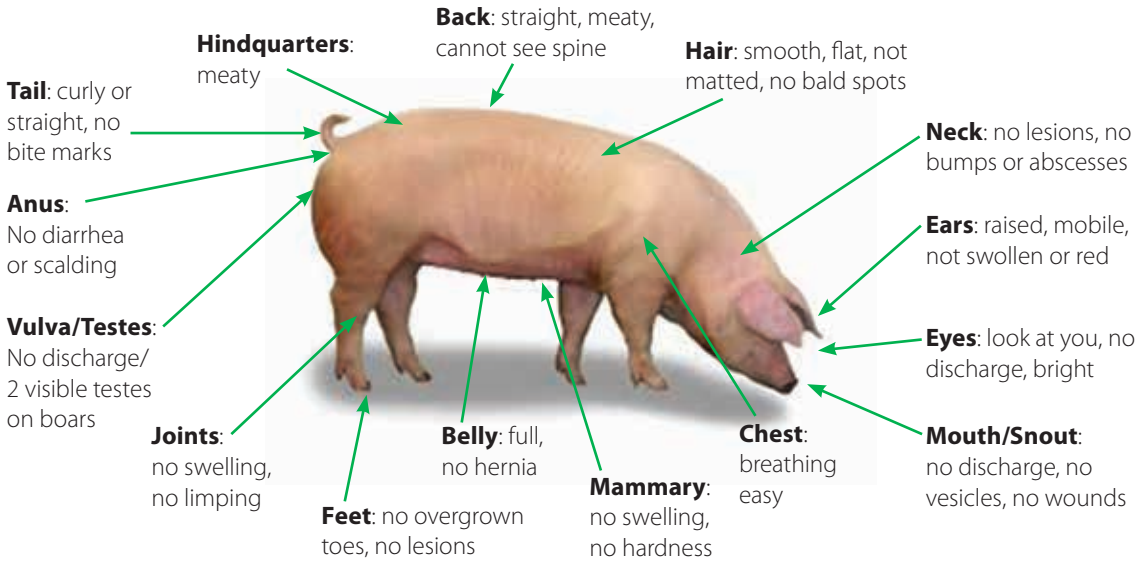
Source: Adopted from Manual for Pig Rearing In Uganda, 2011[1]

See Section 6: THE PIG – WHAT TO EXPECT for specifics on pigs of different life stages.

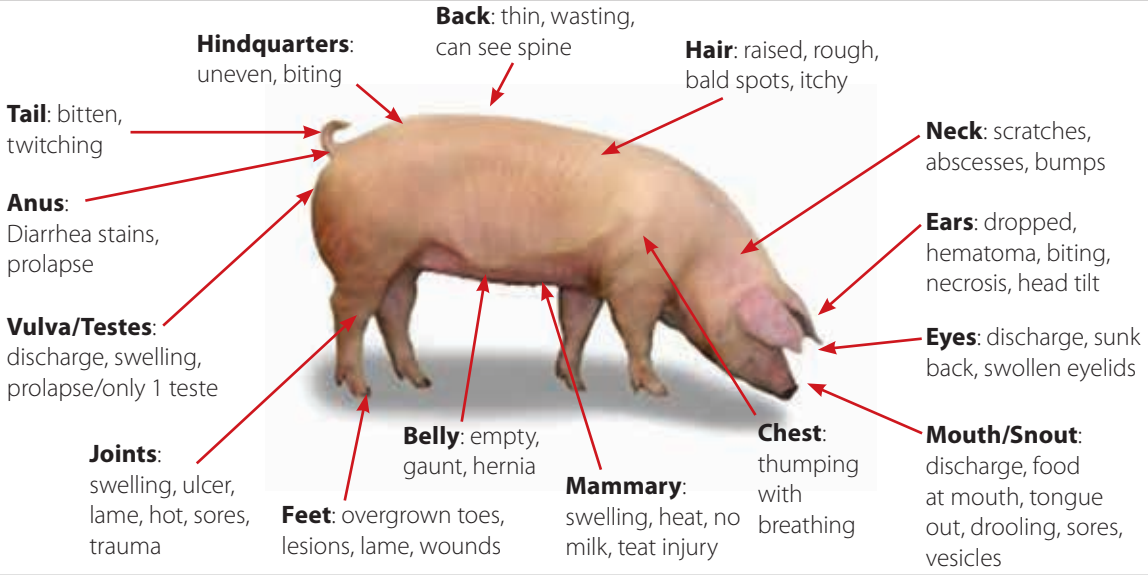
CLINICAL SIGNS: WHAT does my pig look like?

NORMAL AND ABNORMAL CLINICAL SIGNS

Normal expected signs



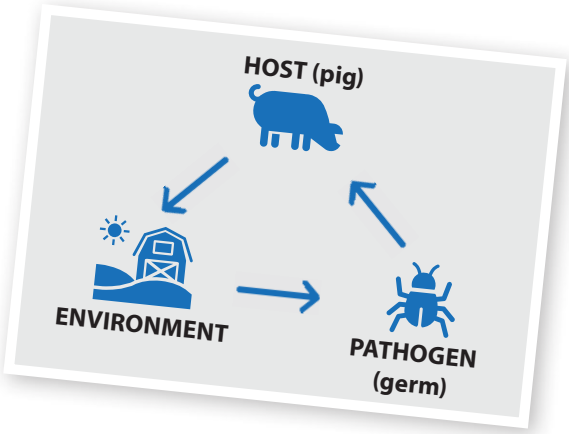
Abnormal signs which should raise concern



Source: Adopted from Manual for Pig Rearing in Uganda[1]

It is important to take a thorough look at your pig and look for any abnormal signs as pointed out in the table above.

7.4 DISEASE SPREAD



For disease to establish itself, there needs to be 3 things:

1. A susceptible **host**;
2. A disease-causing **pathogen**; and
3. A compromised **environment**.

Consider an example of a teenager who insists on not wearing a jacket on a cold day, who is stressed out about a math test, and heads to school during flu season. We have the perfect set-up for disease:

1. **Host**: *a stressed adolescent who is chilled because they refused to wear a jacket on a cold day.*
2. **Pathogen**: *influenza virus.*
3. **Environment**: *school – a place filled with children and teenagers high-fiving, coughing, sharing lunch, touching doors, sharing same air space, and germs.*

*It is the **combination of events** that favour disease.*

	COMMENTS	DO:	AVOID:
HOST	• Pigs are the hosts we are dealing with. • Piglets have weaker immune systems (like human babies). • Older animals are less susceptible to disease.	• Make sure ALL piglets get adequate colostrum soon after birth from their mother. • Vaccinate and deworm animals.	• Mixing age groups. • Keeping sick pigs with the group.
PATHOGEN	• The germs can be from viruses, bacteria, or parasites. • Can be shed from saliva, urine, feces, nasal discharge, blood, and semen of pigs.	• Remove any dead animals from pens (they can be infectious and spread disease). • Segregate sick animals from healthy animals. • Frequently clean manure from pens.	• Bringing in new animals to the herd without quarantine. • Letting sick animals have nose-to-nose contact. • Letting infectious material like diarrhea, blood, or other contamination build up.

	COMMENTS	DO:	AVOID:
ENVIRONMENT 	• Includes people and equipment moving in and out, weather changes, and cleanliness of the pig space. • Pathogens can travel on clothing, boots, and other animals for example.	• Clean and disinfect equipment, boots and buckets that are around pigs. • Provide appropriate physical environment (e.g., bedding, ventilation, lighting, temperature).	• Dirty conditions. • Pests, cats, and other animals interacting with pigs. • Bringing dirty equipment into pig pens.

7.5 PUBLIC HEALTH

KEY POINT CHECKLIST

TAKE HOME MESSAGES:

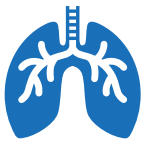
- Always wash your hands before and after handling pigs.
- Cook pork to the recommended end internal temperature of 71°C (160°F).
- Wear appropriate personal protective equipment (PPE) when working with pigs (e.g., gloves, masks, boots, ear plugs).

When working with pigs it is important to know that there are multiple diseases that can pass from pigs to humans. The three main ways that people can become sick from pigs are:

1. **DIRECT CONTACT**: Sick pigs can shed disease-causing pathogens thus causing contamination of themselves and their environment. This contamination can be transmitted to humans through unsafe direct contact with pigs.

Consider some of the diseases that can be spread from pigs to people:

DISEASES	SPREAD THROUGH	EXPOSURE	RESULT
Salmonella, E. coli, Campylobacter	Pig feces 	Human exposure can be through handling pigs, objects in their environment, equipment, boots or clothing and then touching one's mouth or handling food. This can result in accidental ingestion of the feces.	Exposure can result in diarrhea (sometimes bloody), vomiting, stomach cramps, fever, and headaches.

DISEASES	SPREAD THROUGH	EXPOSURE	RESULT
Staphylococcus aureus	Pig oral secretions (nasal discharge), skin wounds, and blood	***S. aureus*** is always present on the skin and in the noses of people and pigs, but it can cause skin infections if you have an open wound or a weakened immune system.	***S. aureus*** biggest concern is that it is commonly resistant to many antibiotics making it extremely difficult to treat.
Streptococcus suis		***S. suis*** can be passed to people through close contact with sick or dead pigs, particularly if you have an open wound.	***S. suis*** can result in meningitis (inflammation of the tissue around the brain and spinal cord), which causes headaches, fever, vomiting, confusion, stiffness, and muscle pain. It can also travel through the blood to multiple organs causing severe disease.
Influenza	 	***Influenza***, commonly known as the flu, is transmitted between people and pigs in the same manner it is transmitted between people: through coughing, sneezing, and contact with discharge from the nose and mouth.	***Influenza*** symptoms in people include fever, chills, aches, sore throat, coughing, and nasal congestion.

Source: Canadian Pork Excellence, Canadian Pork Council, 2020[2]

2. SLAUGHTER & PROCESSING:

- If you are slaughtering and processing pigs at home, it is important to consider that you can catch some diseases through contact with blood and tissue.
- The two main diseases of concern are *S. suis* and erysipelas.
- Both diseases can be passed to people if you already have an open wound that contacts the blood or tissue of an infected pig or if you accidently cut yourself during processing or clean-up with a contaminated knife.
- The symptoms of *S. suis* are described above. In humans, erysipelas is referred to as erysipeloid and causes localized inflammation. This is seen as reddening and pain of the skin around where the disease entered the skin.

3. CONTAMINATED PORK PRODUCTS:

- There are two categories of diseases that you can get from handling and consuming raw or undercooked pork products:
  - The first are those that can contaminate the outside of meat during processing:
    i. This usually happens through manure contamination of the processing area or accidentally cutting the intestines during processing releasing manure onto the carcass.
    ii. These diseases, which are shed in manure, are the same as those discussed above including *Salmonella*, *E. coli*, and *Campylobacter*.
    iii. People can be infected by handling contaminated meat in the kitchen and then touching their face or by consuming undercooked meat.
  - The second category of diseases are parasites that can exist within the meat of the pig:
    i. Three types of parasites can live in cysts in the meat and are infectious if consumed. These are *Trichinella*, *Toxoplasma*, and a type of tapeworm.
       1) *Trichinella* can cause fever, muscle pain, swelling around the eye, and abdominal pain.
       2) *Toxoplasma* usually does not cause disease in otherwise healthy adults, but it can have serious effects if a woman is infected during pregnancy. In this case it can cause miscarriage, stillbirths, severe illness in infected infants, or disability later in the child's life.
       3) Tapeworms consumed in meat can develop to adults in our guts. Migration of the immature form of the worm through our body can result in damage to the spinal cord and brain.

How to Keep Yourself Healthy:

- Avoid touching your face or eating while working with pigs.
- Always wash your hands after handling pigs, dirty equipment, dirty clothing, or raw meat.
- Remove dirty boots and clothing prior to entering the house or eating areas.
- Use cut proof gloves when slaughtering and processing. If an injury does occur clean the wound well and seek medical attention.
- Properly clean and disinfect all equipment used for processing or preparing meat.
- Fully cook all pork products prior to consumption, especially if pregnant.
- Remember, kids and elderly individuals are more susceptible to catching these diseases.

7.6 REPORTABLE DISEASES & FOREIGN ANIMAL DISEASES

KEY POINT CHECKLIST

There are specific diseases that are assigned a status of "federally reportable" (foreign animal diseases), "provincially reportable", or "notifiable" based on their importance as well as eradication status in a designated jurisdiction.

TAKE HOME MESSAGES:

- It is your job to recognize foreign animal disease (FAD) signs and know when to call your veterinarian.
- It is your veterinarian's job to know what 'status' a disease holds and to report the disease to appropriate authorities.
- African swine fever (ASF) is a current example of a FAD that is causing an international crisis and presents a major risk to Canada's pig population.
- It is your responsibility to be aware of FADs of international concerns relating to pig health.
- Do NOT feed meat scraps to pigs. This practice presents a major risk to introducing FADS like African swine fever (ASF) and Foot and Mouth Disease (FMD) to Canada.
- Reportable and notifiable diseases can have significant negative impacts on human health, animal health, export trade, and the Canadian economy.
- A federally reportable disease (FAD) must be reported and is a national emergency involving thorough investigation.
- A provincially reportable disease involves on-farm eradication and further investigation.
  - *Eradication does **not** mean depopulation*
- A notifiable disease is surveillance based and may involve treatment and prevention, but it will not involve a thorough investigation.
- Even if 1 pig acquires a FAD in Canada, it is a national emergency.
- Anyone who owns or works with pigs plays a role in maintaining Canadian pig herd health.
- If you see something unusual on your farm, call your veterinarian immediately.

What swine diseases are federally reportable? (2019)

DISEASE	WHAT IS IT?	HUMAN HEALTH RISK?	ANIMAL HEALTH RISK?	CANADIAN ECONOMY AND TRADE RISK?
African swine fever*	Viral disease that causes massive mortality of pigs.	✗	✓	✓
Anthrax	Bacterial disease that can cause respiratory disease and death in pigs and people.	✓	✓	✓
Brucellosis	Bacterial disease that causes reproductive losses in swine and illness in humans.	✓	✓	✓
Classical Swine Fever	Viral disease that causes massive mortality of pigs.	✗	✓	✓
Cysticercosis "Taenia solium"	Parasitic disease that can infect humans if infected meat is consumed undercooked.	✓	✓	✓
Foot and Mouth Disease	Highly contagious viral disease that causes painful vesicles around the mouth and snout, feet, and teats of pigs and ruminants.	✗	✓	✓
Pseudorabies "Aujeszky's disease"	Viral disease that causes neurological disease in pigs and "rabies-like" disease in other species.	✗	✓	✓
Rabies	Viral disease that causes neurological disease and death in pigs. Other species including humans can become infected.	✓	✓	✓
Swine Vesicular stomatitis	Contagious viral disease that causes painful vesicles around the mouth and snout, feet, and teats of pigs. Looks the same as Foot and Mouth Disease (FMD).	✗	✓	✓
Trichinellosis	Parasitic disease that can infect humans if infected meat is consumed undercooked.	✓	✓	✓

Source: Canadian Food Inspection Agency, Reportable diseases: Terrestrial animals, 2019[3]

What swine diseases are provincially reportable or notifiable? (2019)

Note: Search for specific details about disease status on your provincial government website.

DISEASE	WHAT IS IT?	HUMAN HEALTH RISK?	ANIMAL HEALTH RISK?	CANADIAN ECONOMY AND TRADE RISK?
Porcine Epidemic Diarrhea (PED), **Transmissible Gastroenteritis (TGE),** **Swine delta corona virus (SDCV)**	Group of viral diseases that cause diarrhea and up to 100% mortality in nursing piglets (PED, TGE).	✗	✔	✔
Rabies	Viral disease that causes neurological disease and death in pigs. Other species including humans can become infected.	✔	✔	✔
Salmonella	Bacterial disease that can cause diarrhea or sepsis in swine. Contamination of pork products can lead to human food poisoning.	✔	✔	✔
Toxin Ingestion	Clinical syndromes can arise in pigs that can lead to pork contamination if pigs ingest the following: asbestos, creosote, dioxins, fuel, lead, or poly-chlorinated biphenyls.	✗	✔	✔
Swine Influenza	Viral disease that causes upper respiratory tract infection in swine. There are multiple flu strains amongst pigs, birds, humans, and other species. Humans cannot get the flu from eating pork.	? Although uncommon, humans can get the flu by interacting with pigs who have the flu. Humans CANNOT get the flu from eating pork.	✔	✔

* **AFRICAN SWINE FEVER (ASF)**:
  - Is a serious viral disease of pigs that can cause fever, internal bleeding and high death rates.
  - Highly contagious and can spread rapidly through both direct and indirect contact with infected pigs or pig products.
  - Not harmful to people.
  - ASF has never been found in Canada.
  - It is actively (2018–2020) spreading through Asia, parts of Europe, and Africa.
  - There is currently NO vaccine or treatment.
  - It is spread through live pigs, dead pigs, wild pigs, meat, certain ticks, feed, and equipment.
  - Main risk factors:
    - **Lack of strong on-farm biosecurity standards** – ASF can be brought onto a farm by people who have visited farms from areas that are affected with ASF. This includes bringing contaminated food, clothing or equipment onto farms.
    - **International travellers** – People, such as farm workers, foreign exchange students or hunters, who travelled to countries affected with ASF, could bring back contaminated food, clothing or equipment.
    - **Small scale producers and pig pet owners** – ASF can survive for several months in fresh, frozen, cooked, partially cooked and processed pork products. Feeding pigs food scraps that are infected with the virus can spread the disease to their animals.
    - **Animal feed** – ASF can be spread through contaminated feed or feed ingredients.
    - **Contact with infected wild pigs** – ASF can be spread directly between sick and healthy pigs. This happens through contact with the blood, tissues, secretions and excretions from infected pigs. At the present time, ASF has not been detected in Canada's wild pig population.

Source: Canadian Food Inspection Agency, African swine fever – fact sheet, 2019[4]

Photo 1. African swine fever. There are multiple skin hemorrhages and/or necrosis.
Plum Island Animal Disease Center (PIADC), Center for Food Security and Public Health at Iowa State University, College of Veterinary Medicine

Photo 2. African swine fever. Pig limbs with increased redness of the skin.
Plum Island Animal Disease Center (PIADC), Center for Food Security and Public Health at Iowa State University, College of Veterinary Medicine

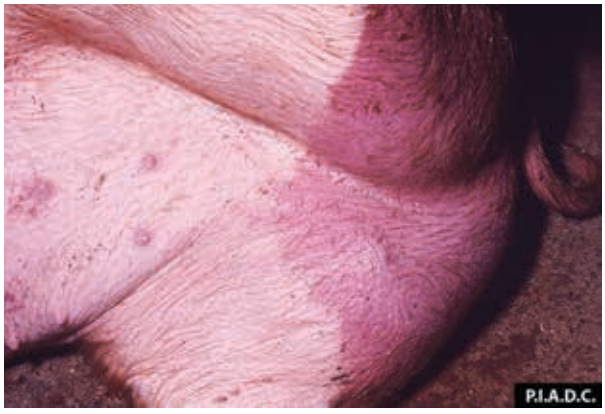


Photo 3. African swine fever. Large skin hemorrhages and necrosis.
Plum Island Animal Disease Center (PIADC), Center for Food Security and Public Health at Iowa State University, College of Veterinary Medicine

Photo 4. African swine fever. Pig kidney with scattered speckled surface (these are hemorrhages).
Plum Island Animal Disease Center (PIADC), Center for Food Security and Public Health at Iowa State University, College of Veterinary Medicine

How can reportable FADs get into Canada?

- Feed ingredients that are not safely sourced.
- Feeding meat scraps or any meat products to pigs.
- Illegal importation of meat or animal products.
- Traveling to countries with FADs and returning to you farm with contaminated boots or clothing.
- Foreign visitors on farms with contaminated boots or clothing.
- Illegal importation of live pigs.
- Compromised Canadian pig herd biosecurity.

What can I do to prevent a reportable FAD from occurring on my farm?

- DO NOT feed ANY meat scraps to pigs. It is **ILLEGAL**. This includes pet food with meat, meat by-products, or meat scraps from kitchen waste.
- DO NOT feed recycled food products or kitchen wastes to pigs due to the risk to animal health and introducing diseases.
- Buy feed from mills that are part of a *"recognized biosecurity program and participate in the Animal Nutrition Association of Canada's Feed Assure Program and follow their National Biosecurity Guide"*.
- If you travel, follow the law and do not bring back ANY illegal animal products.
- If you travel to a country with FADs, practice good biosecurity when you come back to Canada (even if you did not travel to a farm while abroad, follow these 4 easy steps and you will greatly reduce any risk):
  - Change your footwear and clothing prior to coming back to your farm.
  - Disinfect shoes that have been abroad.
  - Wash all clothing that has been abroad.
  - Disinfect cell phone or other items that have been abroad (*Lysol wipes*).
- Talk to your veterinarian about appropriate deworming programs.
- Practice good biosecurity. Remember, it only takes 1 pig to impact the Canadian herd.

What clinical signs should alert me?

- ANY fluid filled vesicle or blister.
- Sudden mortality of multiple animals.
- Severe hemorrhaging.
- Severe diarrhea that causes death in piglets.
- A known toxin ingestion.
- Concerns from your abattoir or meat inspector on the carcass.
- Bizarre behaviour, excessive salivation, or abnormal neurological activity.

What should I do if I suspect a provincially or federally reportable animal disease?

- Emergency Quarantine:
  - Contact your veterinarian immediately.
  - Stop ALL movement (foot or vehicle) to and from your farm immediately.
  - Set up fencing at your driveway to prevent any traffic onto your farm.
  - Wait for further instructions from your veterinarian or government officials.

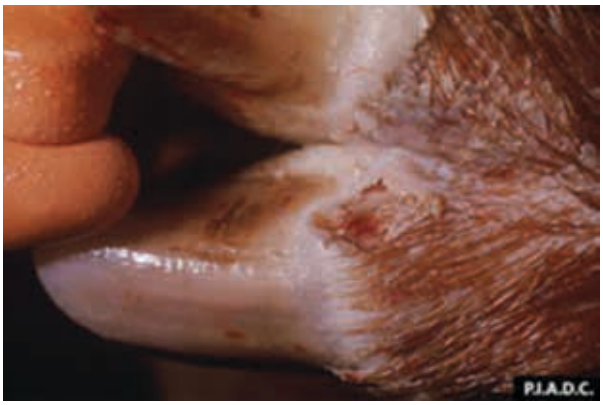


Photo 5. Foot and Mouth Disease. Pig foot with a ruptured vesicle.
Plum Island Animal Disease Center (PIADC), Center for Food Security and Public Health at Iowa State University, College of Veterinary Medicine

Photo 6. Foot and Mouth Disease. Pig foot with ruptured vesicles and sloughing of skin.
Dr. D. Gregg, Noah's Arkive. Plum Island Animal Disease Center (PIADC), Center for Food Security and Public Health at Iowa State University, College of Veterinary Medicine

7.7 COMMON DISEASES OF OUTDOOR PIGS

There are a number of diseases that are more commonly seen in outdoor pig production that you should familiarize yourself with. Please note, any management comments are basic guidelines. For your specific farm, all health protocols should be designed with your veterinarian.

	What are the clinical signs?	What is it?	What should I do?
Porcine Circovirus (pcv)	• Wasting • Poor growth • Patchy red skin • Difficulty breathing • Diarrhea in young pigs	• Virus that destroys the immune system • Affects all ages, but its appearance varies with age	• ***Prevention***: vaccinate all pigs • ***Treatment***: antibiotics for secondary bacterial infections
Influenza (Flu)	• Fever • Dry cough • Sneezing • Clear discharge from eyes and nose	• Virus that causes respiratory disease • Pigs can pass the flu to people, but more commonly people pass the flu to pigs • Affects pigs of all ages	• ***Prevention***: some strains can be vaccinated for • Avoid contact with pigs if you have signs of flu • ***Treatment***: medications to control fever
Erysipelas	• Red to purple diamond shaped skin patches • Fever • Abortion • Lameness • Sudden death	• Bacteria • Can infect people, particularly at time of slaughter • Affects pigs of all ages	• ***Prevention***: vaccinate all pigs • ***Treatment***: antibiotics
Clostridial Diseases	• ***Nursing pigs***: sudden death, bloody diarrhea, high mortality • ***Mature pigs***: sudden death, rapid bloating and decomposition of carcass	• Group of related bacteria • Affects neonates and nursing pigs differently than mature pigs	• ***Prevention***: vaccinate prior to farrowing and ensure good colostrum intake and vaccinate at weaning • ***Treatment***: antibiotics and isolate affected pigs
Streptococcus suis	• Swollen joints • Head tilt • Tremors • Incoordination • Pneumonia	• Bacteria • Can infect people, particularly if contact with damaged skin occurs • Affects nursing and recently weaned pigs	• ***Prevention***: good environmental management and stress reduction • ***Treatment***: antibiotics and separate affected pigs
Haemophilus parasuis (Glasser's)	• Sudden onset of disease • Sudden death • Swollen joints • Incoordination • Tremors • Pneumonia	• Bacteria that can affect many different body systems • Affects 1–4 month old pigs mostly	• ***Prevention***: reduce stress at weaning and in nursery • Vaccinate if this is a problem on your farm • ***Treatment***: antibiotics and separate affected pigs

7.7 COMMON DISEASES OF OUTDOOR PIGS

	What are the clinical signs?	What is it?	What should I do?
Foot Rot (Bush Foot)	• Lameness • Painful, swollen claw • Cracking or splitting of the hoof	• Bacterial infection of the claw that can extend into the soft tissue between claws • Affects mostly older animals and is predominantly seen in hind feet	• ***Prevention***: proper flooring, clean and disinfect flooring regularly • ***Treatment***: antibiotics, an anti-inflammatory, or foot bath if it is a herd problem • Move to hospital pen
Mycoplasmal Diseases	• Dry cough • Difficulty breathing • Lameness, stiff movement • Large swellings around joints • Decreased growth	• Group of related bacteria • Affects pigs 6 weeks to market age	• ***Prevention***: quarantine new animals and source new animals safely • Vaccinate if this is a problem for your farm • ***Treatment***: antibiotics and separate affected pigs
Ascaris suum	• Skinny • Decreased growth • Rough hair coat • Droopy abdomen • Chronic coughing • White spots on liver at slaughter	• Parasitic worm • Affects growers and older pigs	• ***Prevention***: proper deworming protocol • Environmental sanitation and pasture rotation • ***Treatment***: dewormer
Trichuris suis (Whipworm)	• Skinny • Decreased feed intake • Mucoid and/or bloody diarrhea • Dehydration	• Parasitic worm • Affects pigs four weeks after exposure to contaminated environment	• ***Prevention***: proper deworming protocol • Pasture management and rotation • ***Treatment***: dewormer
Toxoplasma gondii	• Rarely causes clinical disease in otherwise healthy pigs • May cause abortion or stillbirths if sow infected • May cause diarrhea, incoordination, or cough in piglets	• Parasite • People can be infected by eating undercooked meat • Disease varies with age at which pig is infected	• ***Prevention***: keep cats away from pigs and their feed • ***Treatment***: none
Trichinella spiralis	• Rarely causes clinical disease in otherwise healthy pigs • May cause decreased growth and muscle pain	• Parasitic worm • People can be infected by eating undercooked meat	• ***Prevention***: do not feed waste meat products • Rodent control • ***Treatment***: none
External Parasites (Mange)	• Itching/rubbing on objects • Crusting wounds • Fluid filled lesions • Decreased growth • Visible bites	• Parasites that live on the skin (mites, fleas, lice, flies) • Most serious is mange caused by mites • Affects pigs of any age	• ***Prevention***: environmental control and proper dewormer protocol • ***Treatment***: anti-parasitic and soaps or disinfectants for the skin applied topically

	What are the clinical signs?	What is it?	What should I do?
Piglet Scours (Diarrhea)	• Diarrhea • Rough hair coat • Wasting or skinny • Failure to grow • Mortality varies with cause of diarrhea	• Bacterial or viral disease • Affects nursing piglets	• ***Prevention***: vaccinate sows prior to farrowing • Clean environment • Colostrum for every piglet! • ***Treatment***: electrolytes in water, Kaolin pectin (absorbent) • If no response, then try antibiotics
Lameness	• Limping • Swollen joints • Non-weight bearing • Slow to rise	• Can be caused by infection or by trauma • Affects pigs of any age	• ***Prevention***: non-slip flooring • Environmental sanitation • ***Treatment***: antibiotics or anti-inflammatory • Euthanasia if the leg is broken or not responding to treatment
Deficiencies	• Lameness • Deformation of legs • Fractures under minimal stress • Goiter development • Birth of weak or stillborn piglets • Pale piglets • Heart disease • Abnormal hair coat • Failure to grow	• Lack of an essential nutrient due to an improper nutritionally balanced diet • Predominantly seen in piglets, rapidly growing pigs, or lactating pigs	• ***Prevention***: consult a nutritionist or vet to ensure diets are nutritionally balanced for all age groups • Iron injection for all piglets within 3 days of birth • ***Treatment***: supplement deficient nutrient
Mastitis or No Milk	• Udder is hard, swollen, and hot • Fever • Vaginal discharge • Inadequate milk production • Refusal to nurse • Off feed • Listlessness	• Infection causing inflammation of the udder and uterus with poor to no milk production • Affects breeding females	• ***Prevention***: good farrowing sanitation • Environmental sanitation • Management of sow body condition and nutrition • ***Treatment***: antibiotics and an anti-inflammatory
Rectal/Pelvic Organ Prolapse	• Organ hanging behind the pig through the anus or vulva • Exposed tissue will swell, dry out and die	• Rectum, vagina, uterus, or bladder can evert from body. • Affects weaned and older pigs • Can be associated with stress, illness, poor feed quality, or difficult farrowing	• ***Prevention***: good feed quality • Prompt treatment of diarrhea and coughing • Avoid piling (cold and transport stress) • ***Treatment***: can be surgically repaired by properly trained individual • Uterus prolapse is an emergency • Euthanasia

7.7 COMMON DISEASES OF OUTDOOR PIGS

	What are the clinical signs?	What is it?	What should I do?
Hernia (Umbilical or Scrotal)	• ***Prevention***: clean environment for newborn piglets to prevent naval infection • ***Treatment***: Can be surgically repaired by properly trained individual • Euthanasia if large or infected	• Intestinal tissue that is trapped in an opening of the muscle tissue • Can affect pigs 3–5 weeks of age but will enlarge as pigs grow	• ***Prevention***: clean environment for newborn piglets to prevent naval infection • ***Treatment***: can be surgically repaired by properly trained individual • Euthanasia if large or infected

Note: Farrowing related complications can be found in Section 6.5 FARROWING & POST-FARROWING COMPLICATIONS.

Photo 7. Piglet scours, Dr. Egan Brockhoff

Photo 8. Porcine circovirus, Dr. Ted Clark

Photo 9. Lame pig, Dr. Kelsey Gray

Photo 10. Strep suis, Dr. Egan Brockhoff

7.8 DISEASE MANAGEMENT

There are three major components to disease management.

1. Prevention
2. Identification and Diagnosis
3. Treatment

Disease management definitions to familiarize yourself with:

WORD	DEFINITION
Colostrum	First milk from the sow. It is rich in antibodies and nutrients for newborn piglets.
Antibody	A large protein used by the immune system to fight off pathogens (e.g., bacteria, viruses).
Vaccine	A substance used to stimulate antibody production to boost an animal's immune system and fight off pathogens.
Booster Shot	The second or third dose of a vaccine. If we think of vaccines like building a military, the first dose is the call for soldiers, and the second dose is getting soldiers trained and ready for combat. Most vaccines require a booster shot.
Dewormer	A substance used to prevent or fight off parasites (e.g., tapeworms, mites, manage, other worms).
Immunity	The ability of an animal to resist or fight off infection.
Antibiotics	Medicines used to fight off specific bacterial infections.
Antibiotic Resistance	The process where bacteria can grow in the presence of an antibiotic that would normally kill them.
Class 1 Antibiotics	Antibiotics that are considered important in human health. These types of drugs are used by people for specific reasons ranging from urinary tract infections to post-operative infection care.
Anti-Inflammatory	Medicine that reduces inflammation and pain. It brings down redness, swelling, edema, heat, and pain.
Withdrawal Times	The amount of time that you must wait AFTER medicating an animal before sending an animal to slaughter. E.g., If you are giving a medicine that is required once a day for 3 days and the withdrawal time is "8 days", after the 3rd and final treatment, you must wait 8 full days before the animal can be slaughtered to ensure the meat will be free of medication residue.

1. PREVENTION

Disease prevention is a combination of proper animal husbandry (including creating a healthy environment and feeding appropriate diets), performing proper piglet care, and administering vaccinations and a dewormer.

BASIC GUIDELINES on preventative measures to take during a pig's life:

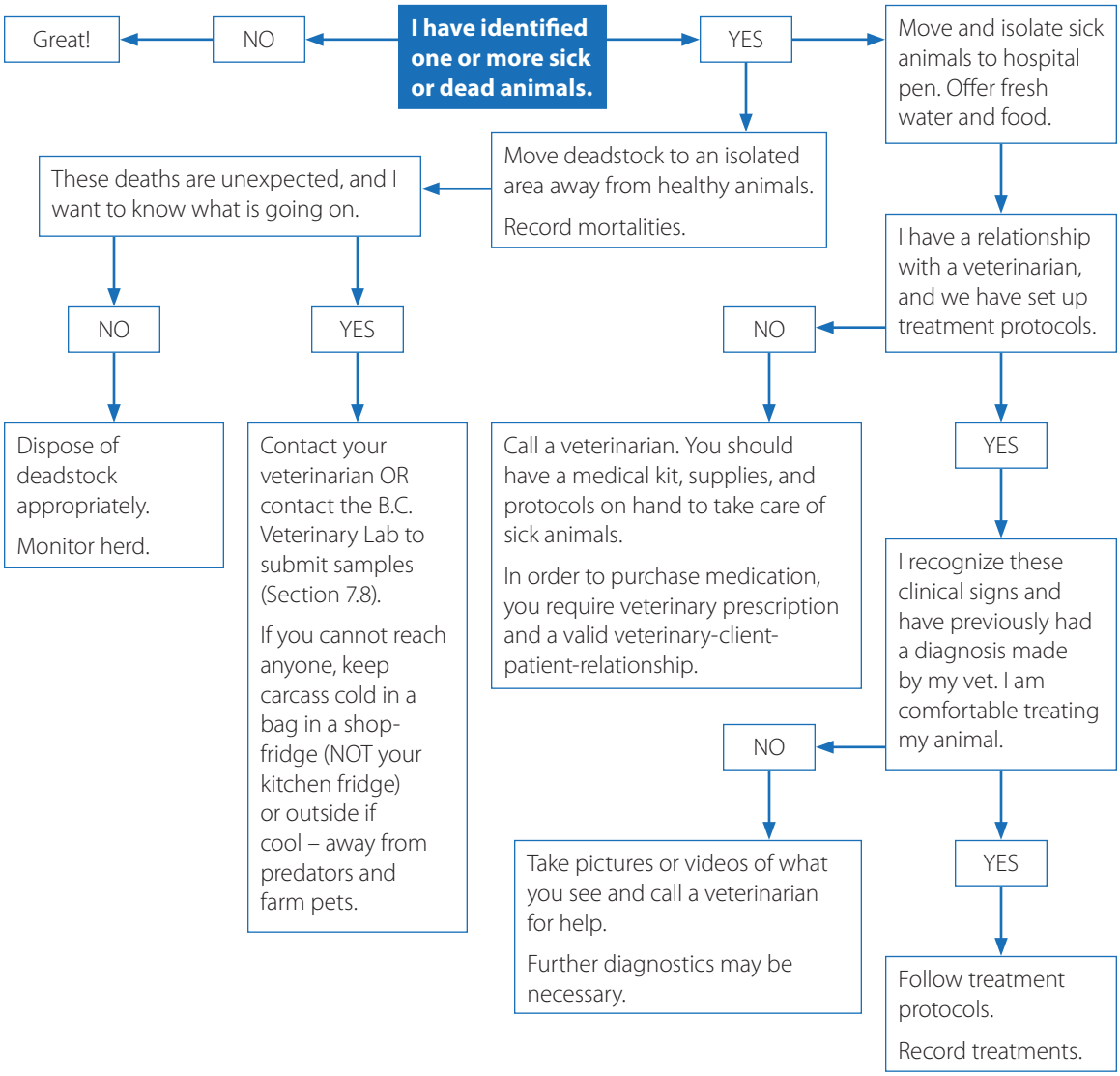
Note: Every farm is unique. Vaccine and deworming protocols should be established in consultation with your veterinarian.

PRODUCTION STAGE	VACCINES AND DEWORMER	TIMING	OTHER
Unbred sows before breeding	• Vaccinate for reproductive diseases: erysipelas, leptospirosis, and parvo virus. Vaccines often come in combination.	• 2 weeks before being penned with the breeding boar.	• Maintain ideal body condition score. • Have long toes trimmed to prevent lameness.
Pregnant sows and gilts	• Vaccinate for piglet scour pathogens: rota virus, clostridial disease, and E. coli (vaccine is given to protect piglets). Vaccines often come in combination. • Give broad spectrum dewormer.	• Gilts: 5 and 2 weeks pre-farrow. • Sows 2 weeks pre-farrow. • 2 weeks pre-farrow gilts and sows.	• Move pregnant animals to maternity pen about 1 week before farrowing. • Maternity pen should be clean, dried, warm, and well-bedded.
Lactating sows			• Offer fresh feed daily ad libitum. • Offer high energy ration. • Maintain body condition score.
Piglets 1–4 days old			• Colostrum for ALL piglets within 12 hours of being born. • Iron injection for ALL piglets before 4 days old.
Weaned Pigs	• Vaccinate for erysipelas. • Vaccinate for clostridial diseases. • Vaccinate for circo virus (pcv2).	• At weaning or at 5–6 weeks of age for all vaccines.	• For your growing herd, there are many different vaccination protocols. Consult with your veterinarian about what is appropriate for your herd.
Growing Pigs	• Vaccinate for erysipelas. • Vaccinate for clostridial diseases. • Give broad spectrum dewormer.	• Vaccinate and deworm for these diseases going into spring and fall.	• You may need to deworm more than twice a year. Talk to your slaughter plant about parasite surveillance.

PRODUCTION STAGE	VACCINES AND DEWORMER	TIMING	OTHER
Finishing Pigs			• You may deworm one more time before slaughter. Talk to your slaughter plant about parasite surveillance.
Replacement Gilts and Boars	• Vaccine for erysipelas. • Vaccine for clostridial disease. • Vaccine for circo virus (pcv2). • Vaccine for reproductive diseases: erysipselas, leptospirosis, parvo virus.	• Erysipelas, clostridial disease, and pcv2 vaccines should be given with your growing herd if raising own replacements. • First time gilts and first time breeding boars should get repro vaccine twice (3 weeks apart) before being penned up for breeding.	• If you are purchasing breeding animals, get a thorough history of their vaccination history. Consult with your veterinarian about the best vaccination protocol for new animals.
Breeding Boars	• Vaccinate for reproductive diseases: erysipelas, leptospirosis, and parvo virus (vaccines often come in combination).	• Vaccinate 2x a year.	• Do not let boars become obese. • Have long toes trimmed to prevent lameness.
Newly purchased animals			• Consult with your veterinarian about on arrival protocols for new animals.

2. IDENTIFICATION & DIAGNOSIS

As a pig farmer, you should learn how to recognize clinical disease. Please go through this entire chapter for more information on recognizing abnormalities and to learn about common diseases of pigs. Review this flow-chart for identifying and making plans for a sick animal.



Note: If you suspect a reportable FAD, contact a veterinarian immediately!

3. TREATMENT

Veterinary-Client-Patient-Relationship:

- If you are treating an animal, you should be following veterinary recommendations.
- You must establish a valid veterinary-client-patient-relationship (VCPR).
- To do this, a veterinarian must visit your herd once a year to review health and treatment protocols.
- A VCPR allows your vet to prescribe medications and establish protocols that you can use throughout the year.

Records:

- You should record all treatments administered.
- Treatment records should include: animal ID or number of animals treated, reason for treatment, date, weight of animal(s), medication(s) used, route of administration, dose, number of treatments, and withdrawal times.

EXAMPLE

DATE	ANIMAL ID	WEIGHT	REASON	MEDICATION	ROUTE	DOSE	TREATMENT NUMBER	WITHDRAWAL
Nov 1 2019	5467	~100 kg	Swollen Joint	Antibiotic X Anti-Inflammatory Y	In the muscle for both	4 ml 2 ml	1/3 1/1	8 days 5 days

Medical Kit:

- You should have a medical kit on hand.
- Keep your medical kit clean.
- Store your medical kit somewhere safe since you are responsible for the medications in that kit.

- A medical kit should include:
  - Gloves
  - Needles of varying sizes

Size of Needle Guidelines:

SIZE OF PIG	NEEDLE GAUGE	NEEDLE LENGTH (INCHES)
Adult (>125 kg)	16	1-1/2
30–125 kg	16	1
20 kg	16 or 18	1 or 3/4
10 kg	18	3/4
5 kg	18 or 20	5/8 or 3/4
Piglet	20	1/2 or 5/8

Source: Canadian Pork Excellence, Canadian Pork Council, 2020[3]

  - Syringes of varying sizes (3 ml – 20 ml)
  - Hog snare
  - Ear plugs
  - Some kind of soap
  - Some kind of disinfectant (alcohol or a peroxide)
  - Injectable iron (necessary for piglets)
  - Injectable antibiotics (e.g., penicillin)
  - Injectable anti-inflammatory (e.g., meloxicam)
  - Electrolyte powder
  - Kaolin Pectin or activated charcoal
  - Scalpels (#10 or #15 blades)
  - Slap-shots (this is long tubing that you can attach your needle to on one end and a syringe on the other – it gives you more room to work with the animal and is very helpful).

- Regularly go through the medical kit and **discard expired medications**.
- Pay particular attention to storage instructions for medications since **some medications must be refrigerated**.

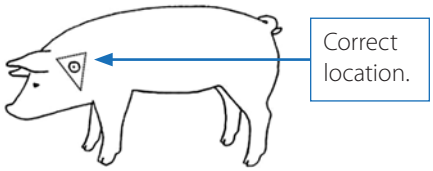
Photo: Alberta Pasture Pig Producer/Breeder

Safety:

- When treating animals, it is important that you keep yourself safe, your animal safe, and the meat safe for consumption (if you are raising meat animals).

DO:

- Work in pairs. It's best to have two people working together.
- Restrain animals securely before injecting them. See PIG TIPS from Section 4.6 ANIMAL HANDLING & SAFETY.
  i. Restrain animals with a hog snare or have them cornered safely using hog boards.
- If you are injecting an animal:
  i. Use the correct needle size.
  ii. Use a fresh needle (or change needles every 5–10 animals).
  iii. Inject directly into the neck muscle at 90-degree angle.
  iv. Use a slap shot on larger animals.



- Follow veterinary recommendations.
- Record treatments.
- Adhere closely to withdrawal times.

Photos: Dr. Kelsey Gray

AVOID:

- Chasing animals around to inject them.
- Using dirty, old, or bent needles.
- Using expired medication.
- Not following veterinary recommendations.
- Incorrectly using medication.

- WHAT TO DO IF A NEEDLE BREAKS:
  - Mark the animal immediately.
  - Retrieve the broken needle if you can see it.
  - If you cannot see it, mark down the animal ID or tag the animal with a new ID.
  - Make record of the broken needle.
  - At slaughter time, inform the slaughter plant of the broken needle so it can be located before preparing meat.
  - Review what happened and make plans for how to reduce the risk of a broken needle in the future.

Note: For international pork sale, finding a broken needle in pork oversees can cause major problems!

Antibiotic Resistance:

- Antibiotics are used in livestock production for managing disease and treating sick animals. If you are raising pigs, you will likely have to use an antibiotic on a sick animal at some point in your pig-farming career.
- Antibiotics include drugs like penicillin, a commonly known antibiotic. This class of drugs is used to treat bacterial infections. Over the last few decades, awareness about antibiotic resistance has been becoming more prevalent.
- Resistance means the bacteria are able to grow despite being treated with antibiotics.
- Resistance is an international concern because antibiotics are critical for the treatment of animal as well as human illnesses.
- When administering antibiotics to animals, you are accountable to using them responsibly.

DO:

- Limit use of antibiotics for treatment as recommended by your vet.
- Use antibiotics at the correct dose, for the correct duration, and for the correct disease.

AVOID:

- Using multiple different antibiotics at the same time.
- Using antibiotics preventatively or without reason.
- Not completing the full duration of the recommended treatment.

7.9 VETERINARY DIAGNOSTICS

The Animal Health Centre, part of the B.C. Ministry of Agriculture, is a world-class veterinary diagnostic laboratory dedicated to protecting the health of all animals in B.C. It is a very valuable resource for livestock owners, offering a full range of fee-for-service diagnostic testing, including Bacteriology, Histopathology, Molecular Diagnostics, Necropsy, Serology and Virology. The lab is fully accredited by the American Association of Veterinary Laboratory Diagnosticians as well as by the Standards Council of Canada (SCC) for ISO/IEC 17025:2005 and the Canadian Food Inspection Agency.

Samples are accepted from veterinarians, livestock producers, the general public and other government agencies. It offers a wide range of diagnostic tests that are useful for swine owners/producers (discussed in the sections on the specific diseases) and has a staff of veterinarians with advanced specializations in pathology, epidemiology, public health, microbiology and virology available for consultations with veterinarians (preferred), animal owners, and the general public.

A range of tests are available for disease surveillance and diagnostic testing on live pigs, as well as post-mortem examination of deceased animals to determine cause of death and other disease processes that may be relevant to the rest of the herd.

For whole animal submissions for post-mortem examination, up to 3 pigs can be submitted within a single submission so long as the animals within the submission are likely to represent the same disease process (e.g., show similar clinical signs of disease). Submission of multiple animals results in a more representative picture of the disease processes in a herd if there are multiple mortalities. Tissues from animals submitted as a single case will be pooled. If separate tests on individual animals are required, then those animals should be submitted separately.

Submission of samples or whole animals can be facilitated in several ways. Please call the Animal Health Centre at 604-556-3003, or visit our website (www.gov.bc.ca/animalhealthcentre) for more information. All samples must be accompanied by a submission form, which can be filled out directly at the front desk or found on the website. Samples may be dropped off directly or mailed. If samples are mailed they must be packaged correctly (properly labelled and packaged so that they do not leak and arrive

at the lab in suitable condition for examination). Guidance on proper packaging is available on the website or by phoning during office hours.

All charges are payable at the time of submission and results will not be released until payment has been received. Accepted Methods of Payment: VISA, MasterCard, American Express, Debit, Cheque (payable to "Minister of Finance") or Electronic Fund Transfer. Testing for diseases for provincially/federally reportable diseases may, in some cases, be available free-of-charge. If you suspect a reportable disease please contact your local veterinarian and/or the Animal Health Centre immediately. A fee guide is available on the website, or by phoning during office hours.

For information about diagnostic testing for your particular herd, or for guidance on whether or not submission of deceased animals for post-mortem is likely to be valuable, please contact the lab.

Contact Information:

Local phone: 604-556-3003

Toll free: 1-800-661-9903

Front office email: PAHB@gov.bc.ca

Submission forms can be emailed to: PAHB.Submissions@gov.bc.ca

Website: www.gov.bc.ca/animalhealthcentre

Hours of operation: The Animal Health Centre is open Monday to Friday from 8:30 A.M. until 4:30 P.M. Please note that the Animal Health Centre is closed on Statutory Holidays.

Address:
Animal Health Centre, B.C. Ministry of Agriculture
1767 Angus Campbell Road
Abbotsford B.C. V3G 2M3

SECTION 7 REFERENCE LIST

1. Manual for Pig Rearing in Uganda, Dr. Linda Nelson and Dr. John Carr, Daktari Animal Health (2011)
2. Canadian Pork Excellence, Canadian Pork Council (2020)
3. Canadian Food Inspection Agency, Reportable diseases: Terrestrial animals (2019)
4. Canadian Food Inspection Agency, African swine fever – fact sheet (2019)