Introduction

The 4-H Motto
“Learn to Do by Doing”

The 4-H Pledge
“I pledge
My HEAD to clearer thinking,
My HEART to greater loyalty,
My HANDS to larger service,
My HEALTH to better living,
For my club, my community, and my country.”

The 4-H Grace
(Tune of Auld Lang Syne)
We thank thee Lord, for blessings great
on this our own fair land.
Teach us to serve thee joyfully,
With head, heart, health and hands.

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Welcome to the new and improved SWINE project. This project will give members the opportunity to learn about swine and the swine industry, whether they are from swine farms or not.

Members will gain skills in a “Learn to Do by Doing” atmosphere through activities, tasks and information sharing. This Swine Project will be broken down into several units:

**Introduction:**
- **Roll Calls** - for use throughout the project; variety provided for each unit.
- **Parts** - parts of the pig- proper names and location on the animal.
- **Pigtionary** - common terms used in the swine industry and their definitions as they pertain to this unit.
- **Overview** - life cycle, stages of swine growth and development, yesterday and forward to today.

**Health:**
Of swine for all ages and stages of swine production. This includes non-infectious and infectious disease processes.

**Nutrition and Supplementation:**
For all ages and stages of swine production, under current rules and regulations.

**Housing:**
For all ages and stages of swine production- focus on “Best Practices” as set out by CQA (Canadian Quality Assurance) and OMAFRA.

**Transportation and Management** - of all stages of the pig.

**Bio-Security, Traceability Act and Nutrient Management:**
Issues as they stand today.

**Careers:**
The many different facets of the swine industry - who is involved?

This project will also supply hands on activities for the members to work on, as well as project and research ideas.

**Record Keeping**
Emphasis will also be put on Record Keeping. Whether they are going to show their swine 4-H Project or just learn about swine, all of the members need to know how important record keeping is to any livestock enterprise in today’s marketplace. If the member is not showing a pig, their record book can be kept on a virtual pig, based on the usual size that 4-H members show and sell. This would require them to do more research on their own, in order to know what options are available for the animal in their care. The Virtual Pig can be found on www.thepigslist.com. Record keeping booklets will be provided for the members’ use. The Record Keeping book should be reviewed at every meeting, or as the Leader sees fit.
**How to Use this Manual**

The format of this Swine project will be laid out in such a manner that you can choose which unit or part thereof to use at any given meeting. There is more than enough material to run this project in a broad (as an overview or introduction to swine) or in a very specific manner (focus only on one age, or one unit).

It is also helpful to call upon experts in the swine field. (e.g. Veterinarians, Feed Representatives, AI unit personal, Swine farmers etc.)

At the beginning of each section, you will find an overview of the unit, followed by tips specific to each section, including materials required, and possible activities. Copy sheets for your members as you see fit.

Sections deemed particularly useful for members are marked with the icon. Possible roll call questions are provided in this section.

It is recommended that you cover the General Overview of the swine project as well as the *Pigionary and Parts Diagram of the Swine* periodically throughout this project as you deem necessary. If members are showing a project animal they will need to know these descriptive words if a judge asks them during a show. Also, if the members are showing a project animal they will need to become familiar with the *Record-keeping book*. ALL members whether they are showing a project pig or not must keep this book. If the member is not showing they can use a virtual pig of about the same age and still participate in this part of the project. Members not showing an animal could be expected to help out their fellow members at a show- **working as a team**.

**As a club volunteer your responsibilities are to:**
- Have a membership list made with fees collected (if applicable) by the end of the second meeting.
- Review project material in both the member and volunteer guide to familiarize yourself with and adjust the information to the age group.
- Arrange your own schedule using the meeting overviews and participate in each club meeting, achievement program and activities.
- Attend a volunteer training session.

**As a club member your responsibilities are to:**
- Participate in at least 2/3 of his/her own club meeting times.
- Complete the project requirements to the satisfaction of the club leader (s).
- Take part in the project Achievement Program.
Information on Parliamentary Procedure

What is Parliamentary Procedure?

- Set of rules used to conduct a well-organized meeting.
- May be used in meetings to make decisions or simply to run the meeting.
- Saves time and eliminates confusion if done correctly.

Motions:

- Procedure to have a topic discussed and recorded
- Any member may make a motion for their idea or plan
- The member raises their hand then addresses the chairperson/president/person in charge.
- The member is then called upon to speak, whereupon they state “Mr. / Ms. President, I move that…”
- Another member must now state “I second the motion”
- The president will now state the motion, debate or discussion will take place, the motion is put to a vote and the results are announced.

Nominations:

- Members help choose the officers for their club by formally presenting the name of a candidate to the club for a position to be filled.
- The Candidate is referred to as the nominee.
- The Chairperson must call for nominations by saying “Nominations are now open for the position of…”
- Before closing nominations the chairperson must call for any additional nominations three times.

Two types of nominations that could be used:

1. From the floor: chairperson asks for nominations, after the member has been addressed they will state the name and position to be filled, the name is written down.
2. By Written Ballot: each member writes down the name of a member they would like to nominate and ballots are read by the chairperson.
3. The chairperson must then ask if the nominee is willing to have their name stand for the position.
4. The chairperson must then ask for any additional nominations, if there are none then they will declare that the nominations are closed.

Elections:

- Nominations are closed and now the club can vote on the names by ballot or by show of hands (if this is done have the nominee leave the room)
- Vote for each position separately
- If there is only one person nominated for a position then the chairperson asks for a show of hands in agreement that the candidate be declared a unanimous decision.
Executive Duties

President
- Oversee organizing and running meetings, and payment of bills
- Acts as the chairperson of all meetings
- Needs to remain impartial to all discussions held

Vice-President
- Learns duties of the president so they may act as chairperson
- Helps with preparation of each meeting agenda and assists other members
- Attends to special guests
- Conducts meetings in absence of president

Secretary
- Assists the chairperson in preparing meeting agendas
- Prepares minutes for each meeting
- Deals with all correspondence and records
- Notifies members of special meetings
- Keeps list of members
- Has all papers and information available to everyone in the club
- Prepares reports for the club

Press Reporter
- Publicizes any upcoming events in the local newspaper or in the 4-H Association Newsletter
- Takes notes at general meetings and may send highlights of the project on to 4-H Ontario magazine or Region ASR.
- Organizes committees to help publicize any 4-H events
- Keeps a scrapbook of photo clippings of the club and its members

Treasurer
- Collects dues for any special event
- Keeps a record of any financial matters of the club, including receipts, bank statements and invoices to be paid
- Deposits funds in the bank
- Acts as one of the signing officers on all cheques
General Overview

The First Meeting of any/all Swine units:
Welcome the members and conduct an icebreaker to help members and leaders get to know each other.

Introduction - Leader’s Information

Suggestions to Begin this Section:
1. Call the meeting to order and begin with the 4-H Pledge. Post a copy of the pledge so everyone can see it.
2. Hold the Election of officers for this project, and select a group name if appropriate.
3. Discuss the member’s requirements for this project and any expectations you have of the members, such as achievement and record keeping books.
4. Complete the membership list in this meeting. Be sure that the members fill in their own contact sheets in case they need this information at a later date.
5. Choose a Roll Call Question from the list provided or add one of your own.
6. Review the Overview page and Pigionary - we recommend starting with these pages no matter where you choose to begin with this project. The Pigionary contains some of the common terms that the members will see throughout this project, and in any reading that they do about swine and the swine industry. You may want to review the Pigionary at the start of subsequent meetings, to ensure members are becoming familiar with these common terms.

ACTIVITY: When discussing the risks involved to the old method of raising swine (on page 16), brainstorm with your members to see what they can think of as risks to non-housed swine.

The answers generated by this activity should center around predators, disease, parasites, piglet crushing, frostbite, sunburn, insect bites, low productivity, had to house your own boar (separate housing away from the sows and piglets)...and anything else they or you as the leader feels would be a reasonable risk factor.

ACTIVITY: The Parts of the Pig

Supplies Needed:
Bristol board
Marker
Clear Mack Tack
Removable tape
ACTIVITY - The Parts of the Pig

Have the members review the diagram provided in this project. Their objective with this will be to name the external parts of swine on a blank diagram or on a live hog. Give them 15 minutes to review their diagram, you as a leader can make up a larger version that does not have the labels, now let them try to label the diagram correctly. This body part review should continue throughout the process of learning about swine at any level. If the members are showing, attending judging events, or demonstrations they will be asked at some point to name a certain part on the hog. This type of diagram can also be useful as an interactive event at fairs where the public can give it a try.

SUPPLIES:
Bristol board
Marker
Clear Mack Tack makes a great inexpensive protector for your diagram, it will help extend its use.
Removable tape (to put answers on with, cover these with mack tack also to protect them for reuse also)

After 5 minutes use an unlabeled diagram and have the members place the proper terms on the diagram. (Like pin the tail on the donkey!!)

After a few weeks of learning the parts of the swine, present the blank picture above to the members so they can practice filling in the blanks. As with the Pightonary, you may want to revisit this activity during future meetings - this activity can be used throughout the project.
The Roll Call Questions on the following pages are guidelines. You may use the questions provided or use your own questions.

**ROLL CALL QUESTIONS**

**HEALTH RELATED:**

- What is another name by which Swine are known? Answers can go around the room. You may get pig, barrow, gilt, sow, piglet, weanling, grower, finisher, hog, boar, grower, or some others.
- Name one thing that farmers can do to keep their pigs healthy? Answers can go around the room. You may get answers like feeding, watering, housing, medicine, vaccination, bio-security etc.
- Discuss the research the members were to do regarding Birth Defects.
- Hand out the sheet in this leaders section that has the correct information in brief on these defects.
- Write down six methods of giving an animal medication. The correct answers are, oral, topical, inhaled, intramuscular injection, subcutaneous injection and passive transfer.
- Name one thing that you have learned in this project that you did not know before. Go around the room and give each member a chance to answer the question.
- Name the most commonly used breeds of pigs used in Canada. Answers will be Yorkshire, Landrace, Hampshire and Duroc.
- How can you tell if a pig is healthy? Answer- bright eyes, eating and drinking well, moving about the pen etc.

**NUTRITION RELATED:**

- What are some sources of protein in the swine diet? Answers can be Plant: soybean meal, corn meal, wheat germ. Animal: meat meal, bone meal, fish meal, milk by products.
- What is mother’s first milk called? Answer- Colostrum. Go on to explain what this is, colour, nutrient value to the piglet and how it changes after 24 hours.
- Name some ingredients you may find in Swine feeds. Go around the room for answers.
- What is the most costly part of raising swine? Answer- the feed ration.
- How many feeding stages would a sow have? Answer- The sow would have three feeding stages - dry sow, gestating sow and lactating sow rations.
- What type of ration is best for the boar? Answer- the boars can be fed a ration similar to either the dry sow ration or the finisher pig ration depending on the age and size of the boar being fed.
- Name some foods that give your body the nutrition it needs to stay healthy and grow strong. Answers- milk- (ask what is in it)- protein, vegetables-vitamins, fruit-vitamins etc.
• Starting with the President go around the room and review what members discovered about different breeds of swine.

**HOUSING RELATED:**
• What are the 3 main types of swine barns? Answer- Farrowing, weaner and/or grower barn and a finishing barn. Members may have different barns at their farm and encourage them to talk about what they do.
• When planning to build a swine barn name some of the important considerations that you need to make to ensure the animals' health and safety. Answers- water, feeders, good ventilation, dry floors, proper flooring for size of animal, space for the number of animals you are housing, proper lighting, biosecurity etc.
• For 10 animals how many nipple drinkers will you need? Answer- 1 for every 10 animals in loose housing or small pens.
• What is the recommended number of animals for grower/finisher animals per pen? Answer- 10-15
• What is the recommended trough space needed for grower pigs? Answer - 6 pigs per space with dry feed and no head barriers, 10 pigs per space where there are full head barriers, 14 pigs per space where there is feed and water mixed
• In hot weather how much floor space do pigs need? Answer- 10-15% more floor space.
• What type of environmental issues cause problems for pigs in the barn? Answer- temperature, humidity and air speed throughout the barn.
• Name 5 symptoms a pig will demonstrate if the temperature is not at the correct level for their age. Answers- Pigs huddled together indicate they are cold - Panting to alleviate heat build up. - Dunging in the eating and sleeping areas - Decreased feed consumption and slow growth rates - Outbreaks of disease such as scours.
• Name two common kinds of lighting found in swine barns today. Answer- incandescent and fluorescent
• What is a photoperiod when we discuss lighting in barns? Answer- the number of hours per day that light needs to be available, the number of hours varies with the age of the pig.
• Why would you need a footbath in your barn? Answer- this helps with disease prevention and transmission.
• Why would you put a big sign telling people they can’t come into your barn? Answer- for biosecurity reasons, other people can bring in diseases and also for safety seasons for both people and animals.
TRANSPORTATION RELATED:

- Name something that would cause a pig to be stressed. Answers—will vary from loud noises, light, no light, rough handling, lack of food or water, overcrowded pens etc.
- What kind of vision do pigs have? Answer—360-degree panoramic vision.
- Should piglets when first weaned be held in larger or smaller group pens? Answer—new weaned piglets should be held in smaller groups to avoid stress as much as possible, usually the first group will be their littermates.
- On any surface that the pig has to walk on what should the slope be no greater than? Answer—20 degrees.
- Should you ship a sick or injured pig? Answer—NEVER—if an animal is injured during transport have the inspector and/or a veterinarian assess the situation when the animal reaches its destination.
- You should always use a cattle prod to keep pigs moving along. True or false? Answer—False—these types of rods are to be used very sparingly if ever.

BIOSECURITY RELATED:

- Who or what poses the greatest biosecurity risk to a swine farm? Answers—Persons who have been in contact with other swine farms.
- What does the term “all in all out” mean? Is it a form of biosecurity? Answer—“All in all out” means just that. All the pigs come into a barn at the same time and they all go out of the barn at the same time. This is a form of biosecurity as it helps prevent the spread of disease among the herd. This method allows for a complete barn sanitation between loads coming into the barn.
- Is record keeping important to biosecurity? Answer—YES, record keeping is very important and should be done daily on the herd. Often if your barn is contracted you are required to keep many kinds of daily logs.

TRACEABILITY RELATED:

- Why do we need traceability? Answer: disease management, public confidence in our food supply chain, to be able to effectively deal with international trade partners, to be able to control and contain disease outbreaks etc.
- What does GPS mean? Answer: Global Positioning System
- How will they be using GPS in the Swine Industry in the future? Answer: By having every facility that houses or handles livestock mapped by the GPS system so they can locate that farm or facility if there is an outbreak of disease.
External Parts of the Swine
External Parts of the Swine

1. 11. 21.
2. 12. 22.
3. 13. 23.
5. 15. 25.
7. 17. 27.
8. 18. 28.
9. 19. 29.
10. 20.
These pages contain some common terms used in the swine industry. As you learn more about swine you will become more familiar with these terms. If you come across a term in any reading that you do for your swine project look it up, ask your leader, add it to your Pigtionary!!

PIGTIONARY

Artificial Insemination
Breeding a sow with semen from a collection bank using breeding rods. Short form seen is AI.

Barrow
A male pig that has been neutered/castrated

Bio-Security
Method used to protect the herd against the introduction or spread of disease.

Boar
Adult male pig kept for breeding

Castration
Removal of male piglets testicles, rendering them unable to breed.

Crossbreed
A pig whose parents are of different breeds.

Contagious Disease
A disease caused by a bacteria or virus that can be transmitted from one animal to another.

Dry Sow
A female pig that is not producing milk (open sow).

Early “Weaner”
A piglet weaned from the sow between 4 and 20 days of age.

Euthanasia
To humanely destroy an animal unfit to ship for consumption.

Farrow
To give birth to a litter of pigs.

Feeder Pig
A piglet after it is weaned from the sow, also known as a “weaner” pig.

Finisher Pig
A pig that is from 60 kg to market weight of 110 kg.

Gestation
The period of time that a sow is pregnant, about 115 days.

Gilt
A female pig that has never farrowed and is about 8+ months of age.

Grower pig
A pig weighing from 25 kg to 60 kg.
Livestock Unit
A measure used to compare odor produced by different animals.

Litter
A group of piglets born at one time from the same sow.

Market Hog
A barrow or gilt raised for meat production, weighs up to 110 kg.

Neuter
The removal of the testes to render a barrow sterile and unable to reproduce.

Non-infectious Disease
A disease not caused by a bacteria or virus and only affects one or very few animals.

Nutrient
Any chemical element or compound essential to the growth and development of an organism.

Nutrient Management
Matching the nutrients in manure and fertilizer to crop requirements in an environmentally friendly way.

Open Sow
A pig that is not pregnant or nursing (waiting to be bred) (dry sow).

Piglet
Newborn pig, weighs 1-2 kg.

Pork
Meat that is obtained from a pig.

Pork Producer
Farmers, the people who raise swine (pigs).

Runt
Smallest piglet in the litter.

Sow
Adult female pig that has farrowed.

Suckling pig
A baby pig that is still nursing from its mother.

Trace ability
The ability to trace, history, application, or location of an animal by means of recorded identification and information.

Weaner pig
A piglet that has been weaned from the sow.
Introduction

BRIEF OVERVIEW OF THE LIFE CYCLE OF THE PIG

“This little piggy…”
Where to begin in the life stages of the pig?

First, let’s look at some changes in the industry in the last 40 years.

Before the 1950’s it was very common for the family farm to raise all manner of farm animals, including pigs. They were usually raised for home use, and kept out of doors and in small shelters with straw bedding. Those were the “good old days” - or were they?

Can you name some common problems that raising pigs in this manner would have encountered? Let’s brainstorm for some answers.

Improvements in technology and growth in farm size resulted in great changes in the way pigs were raised and housed. Swine barns became specialized. From the 1950’s until the 1980’s the average swine barn housed between 50 and 100 sows. Bringing the animals indoors allowed the farmer to monitor herd health, control breeding, care for piglets and feed individual animals according to their needs. These changes resulted in an increase in productivity from 15 live piglets per year to an average of 22+ live piglets per year. Today the average swine farm is even more specialized and will house up to 500 sows on average.

The typical pig’s life cycle will look something like this:

Piglets are born in the Farrowing Barn and stay with the sow in specialized pens that limit the movement of the sow so the piglets can get out of her way so they are not crushed. Piglets weigh about 1-2 kg at birth and only drink milk from the sow, until they are weaned between the ages of 12 to 28 days (depending on the farm system). While they are in this barn the piglets will have their razor sharp milk teeth clipped, tails clipped between 1 and 6 days of age and at 6 days the piglet receives an iron injection. Male piglets are castrated. At about 3 weeks of age on average, the piglets are moved to a different barn, or part of the barn.

This second site is the Weaner Barn where the piglet will be sorted by size into small groups. They are still quite small in size about 7 kg on average and need a warm environment. They will eat about ½ kg of feed that has complete nutrition, and drink from drinker nipples that have metered water flow for maximum fluid intake. Piglets will remain in this barn until they have reached approximately 37 kg in weight.
This is usually at around 12 weeks of age. Some farms specialize just in **weanling pigs** and use an “**all in-all out**” method. This allows the farmer to thoroughly clean and disinfect the barn before the next group of weanlings arrive.

The third housing site is the **Grower-Finisher Barn**. The pig stays in this barn on average from about 12 weeks to 6 months of age. The pigs will remain in this barn until they reach market weight at around 100-110 kilograms. They are usually held in small group pens of 20-25. The gilts and barrows are sorted into pens by size, gender and temperament.

**Breeding Stock**: Some of the best gilts may be kept back as replacement animals in the sow herd. This means that they may be sent back to the farrowing barn where they will produce 2 litters of 8-12 piglets per year, with a gestation (pregnancy) of 115 days. Mature sows can reach a weight of 200 kg in size.

Today most breeding is done by **Artificial Insemination (AI)**, with fresh or frozen semen. This means that the farmer can select the best genetics from around the world to achieve his farm production goals. **Boars** are housed at a separate **breeding station**. Boars can weigh up to 270 kg.

We will cover all of these topics named above in greater detail as the project progresses.
HEALTH

BEST PRACTICES FOR ALL AGES OF SWINE
HEALTH
Overview & Non-Contagious Diseases
Leader’s Information

Suggestions to Begin This Section:
• Do one of the Roll Call questions if you choose.
• Introduce the topic of Health. You can go around the room and ask members for signs of a healthy pig, and then again for a sick pig.
• Fill in any blanks that the members don’t think of. Talk to the members about non-infectious disease.
• If you are covering the units in the order they appear, start to cover the first section of the record-keeping booklet. If a member is not showing a project animal, they are to have a virtual animal and keep records on that animal. Members that elect NOT to show a project animal will be expected to assist their group members at the achievement show. Record keeping is important in all aspects of livestock operations, and will continue to increase in importance as new and stricter animal husbandry regulations are made law.

Activity: Non-Infectious Disease Brainstorming (Leader’s answers on pages 3 and 4, member’s worksheet on page 12)

Activity: Being an Animal (page 5)
Supplies: Dark sunglasses, Vaseline, 4 paper cones (ears), 1 paper, cone for each nose, heavy coats for each “animal”

Activity: Word Search - Find the Poisons (page 6)

Activity: Birth Defects Research (Member’s worksheet on page 7, Leader’s answers on pages 8 and 9).

At the end of this meeting, hand out the research sheet provided in this section. At the beginning of the following meeting, find out what the members learned, and discuss these answers with the aid of the answer sheet provided.
Answers: Non- Infectious Disease Brainstorming Activity
(Member’s portion on page 12)
**Trauma and Injury:** Look for **Cuts and Scrapes** on the pigs in any given pen. First look for an offending object. It may be something in the pen that is in poor condition is broken or worn out. Fix the offending object immediately. If you feel the cut needs treatment, you should follow the recommended code of practices or your contract information and use the proper wound dressing to help heal the cut. (e.g. iodine spray).

**Abscesses** are different from scrapes and cuts. This is a localized swelling under the skin. If you notice this and there appears to be only one on the animal, chances are that it’s treatable on the farm. Isolate the affected animal and lance the abscess, then treat it topically until it clears. However if the animal has many abscesses (3 or more) visible on the outside of the animal there may be more abscesses internally. Abscess can be cancerous or may be from an environmental cause. This needs to be determined by the farmer/manager. This will render the animal unfit for shipping and it will need to be euthanized.

If there is more than one pig in the pen with external abscesses, it is likely they are caused by an environmental factor and the farmer will need to take immediate action to find and fix this problem.

**Bruising:** is the pen overcrowded? Is the animal undersized or oversized and being picked on, or doing the picking? If either of these are the case, this is also fixable, by reducing pen numbers. Remove smaller animals to another group of a more appropriate size, or remove the larger offending animal to a more appropriate pen.

**Lameness:** If lameness is in an individual animal it may need to be snared to examine more closely. Clean and examine the hoof to be sure it is in good repair. Pare or trim hoof if needed and remove any offending debris that may be there. Check for heat or swelling in any of the leg or foot joints. This may indicate a more complicated problem like arthritis. If the lameness is seen in more than one animal in a pen, check the barn conditions. The barn should be dry and clean at all times. Intensive farming of swine has increased the rate of feet and leg problems because of the types of flooring the animals stand on. If this becomes a problem you may need to put down a layer of bedding. (e.g. over concrete flooring, for certain ages or stages of pigs).
**Nutritional Imbalances and Deficiencies:** Test your feedstuffs and be sure that it is the correct ration for the age and stage the pig has reached. Have the feed tested for mycotoxins. These toxins are a fungus found in feed that will decrease milk production in a sow, decrease breeding activity and can cause sudden weakness and even death. Salmonella is also something found in feedstuffs that can cause serious health problems. Studies have found that an increase in B12 in the diet of swine will reduce ear and tail biting. There will be more detail on this subject in Feed and Feed Handling section of this project.

**Allergies** in swine usually come from spores of molds and mycotoxins. They can also be caused by some types of bedding that may be used in barns, such as moldy straw or dusty shavings. Ammonia in the air can also cause allergy symptoms in swine. The symptoms may include sneezing and runny eyes. Excessive bites on the skin from flies and mosquitoes can also cause excessive itching. How can you as the farm manager of these animals help to rid of the problem?

**Old Age:** Age in itself does not mean the animal is not productive. However as animals age there are body changes, just like in humans. The organs begin to slow down and not work quite so efficiently. For example a sow that is too fat or too thin is either not interested in food or her digestive tract is slowing down. As the sow ages her ability to breed and litter size may decrease. In this case each animal needs to be judged on it’s own merit whether it stays on the farm or is replaced by a younger animal.

**Poisoning** can also lead to sudden weakness and death in swine. The pig gets weak, depressed, nervous and stops eating. Drooling and vomiting may also be present. Although because of the way swine are housed today there is less concern about poisonous plants being eaten, there are still other poisons and toxins on the farm that can cause major problems.
ACTIVITY: Being an Animal
This activity will demonstrate how STRESS can affect swine.

Supplies:
Dark sunglasses, Vaseline, 4 paper cones (ears), 1 paper, cone for each nose, heavy coats for each "animal"

Stress is a huge factor in swine no matter what age or stage in their life they are at!! Stress is the number one MANAGEMENT killer in hog barns today. A few practices that can contribute to this problem are over crowding, injury, disease, temperature, and too much movement in the barn i.e.: from pen to pen frequently. Poor handling and loading facilities, aggressive handlers, excessive noise, too little trough space for the number of animals in the pen all contribute.

Poor nutrition or spoiled feed at any and all stages of growth and production will cause extreme stress on swine. Lack of mineral balance is also an important factor. Most of these factors will be discussed at length in other chapters of this manual. How many negative consequences can arise from STRESS in swine??

1. Break into groups of three. One person in each group is the helper and the others are the animals.
2. Cover two pairs of sunglasses with Vaseline. If you do not have sunglasses, you can use cellophane and cardboard. Put on the sunglasses to get an understanding of how an animal sees.
3. To better understand how animals hear, make four cones out of paper to fit over the "animals" ears. Attach with tape, pins or string.
4. Make another cone to fit over the nose to mimic an animal’s ability to smell.
5. Because an animal doesn’t feel as well as a human, put a winter coat on to simulate their sense of touch.
6. Now, to simulate the 360-degree range of animal vision, have the animals in each group stand back to back and link arms. To increase a sense of black and white vision, dim the lights.
7. The third person in each group, the helper, should lead the "animal" around a course or through a doorway.
8. Change the positions so everyone gets a chance to be the animal and the helper. The two people acting as the animal must say what they see and hear because they are back to back and may not know what their other half is experiencing. This represents the animals mind in action.

DEBRIEF: How did you feel being the animal, and having to trust your helper? What kind of discomfort or stress did you feel being the animal? How did your body show stress in this situation?

We take our senses for granted and often assume that everyone senses their surroundings in the same way. Animals, however, sense the world very differently from humans. After “being an animal” with limited vision, smell, hearing and sense of touch, you should have a better appreciation for animals and their behavior.
ACTIVITY - Word Find

Find the Poisons!

<table>
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Word Find:
- Lead
- Cleaners
- Mercury
- Mold
- Salt
- Antifreeze
- Cleaners
- Sprays
- Fungus
- Warfarin
- Lye
- Iron
- Copper
Activity - Birth Defect Research

The following is a short list of Birth Defects- your research is to see if you can find out what the disorders are listed below. How does the animal get this? What does it cause? Is it inherited from the boar or sow? Can we keep and maintain an animal with this problem? Do we know what they look like on the animal? Can we keep the parents of this animal for future breeding consideration? Try to find at least one of these problems to report on for next week.

Cleft Palate:

Artresia Ani:

Arthrogryposis:

Cryptorchidism (Rudgling):

Hernia:

Hydrocephalus:

Rectal Stricture:
Birth Defects Research Answers in Brief

Birth Defects in swine are less common now than they were many years ago, partly due to the introduction of AI (Artificial Insemination). This allows the farmer to take advantage of a larger gene pool for breeding selections. AI avoids the incidence of inbreeding, which causes some of these defects in newborn piglets. It even reduce the incidence of certain diseases that are genetically inherited but do not show up until later in a pig’s life cycle.

**Cleft Palate**- is a hereditary deformity of the facial bones. Usually involving the upper palate of the mouth and sometimes the nose. This disorder is passed to the piglets from the mother. If a sow is throwing piglets with these deformities she should be culled. There have been instances where due to high stress and poor nutrition this disorder has appeared, but it would not be on a regular (every litter) basis.

**Artesia Ani**: is inherited from the boar, but it is a recessive trait. The piglet is born with about 5-10mm of intestine missing and has no anus. This disorder occurs in less than .05% of all animals in a herd so it is not very common. The piglet will not live to see weaning and is usually euthanized.

**Arthrogryposis**- is an inherited disease that causes joint contractures in piglets. It is a very recessive trait. That means that whatever animal is carrying the abnormality, it may never show up, or show up as one in thousands. This disease can be exacerbated (be made to present itself) if the sow is malnourished, has a Vitamin A or magnesium deficiency, or if the pregnant sow has eaten toxic plant material such as tobacco, thorn apple, hemlock or black cherry.

**Cryptorchidism (Ridgling)**: is a condition, which occurs when one, or both testes fail to descend into the scrotum and are retained in the abdominal cavity. Males with this condition are undesirable for breeding. Animals with this condition are also not desirable as market hogs as producers are often penalized for carcasses with Ridglings because the carcasses produce an odour associated with male hormones. This odour is often referred to as boar taint. This disorder occurs in about 1% of all male offspring.

**Hernia**: is one of the most common defects in pigs. The condition occurs when part of the abdominal tissue that supports different organs becomes weak and ruptures. The pressure in the abdomen will cause a bulge through this tear. How much of the organ leaks out determines how big the hernia will be. This problem is a huge economic loss for farmers as the pig cannot feed effectively and the growth is therefore affected. This leads to higher feed costs, and probably extra health considerations. They should never be considered for breeding stock and cull pigs sold for meat are worth less because of this disorder. Hernias
can be congenital or environmental (caused by rough handling). **Hydrocephalus** is an inherited congenital defect of the central nervous system that is present at birth. This disease occurs sporadically in all large animals. Piglets will present with weakness, tremor and sometimes seizures. The head may be markedly swollen due to increased brain pressure. The animal will have minimal time to live and should be humanely euthanized. If the sow that produces these piglet’s progressively has this problem she should be culled from the herd.

**Rectal Stricture**: can result from a birth defect, injury or previous infections, such as prolapse or diarrhea. A scar forms in the anal area that makes the opening too small for manure to pass through the rectum. The early stages of this problem can be difficult to detect. However, pigs with this stricture quickly stop eating and lose weight. They will appear pot bellied because of trapped contents in the gut. This condition is irreversible and these pigs will not respond to treatment.
HEALTH Overview & Non-Contagious Diseases

An unhealthy pig is a non-profitable pig. Just like you when you have the flu or a cold. You stop eating, you’re tired, you slow down - you stop performing your normal tasks. Well, so does the pig no matter what its age or stage of growth.

In this section of the Swine project we will explore some common swine diseases, how they can be prevented or how to treat the pigs that contract those diseases. We will also explore the effect that stress and environment play in the disease process.

But FIRST- how do you know that a pig is healthy? The following words or phrases describe a healthy animal.

- bright, alert, active
- interested in food
- breathing normally and quietly, without coughing or wheezing
- snout moist
- mouth not salivating
- eyes clear and bright
- back straight and relaxed with a normal stance
- clear skin and shiny hair with no cracks, bruises, discoloration or signs of scratching or rubbing

Now that we know what a healthy pig should look like, how can you tell by looking at your pig if it is sick or injured? The following words or phrases describe a sick or injured pig:

- lameness or unusual gait (way of walking)
- swollen limbs or joints
- head down and ears drooping
- abnormal laying down or standing position
- nose dry and may have discharge
- mouth may have excessive salivation
- irregular or noisy breathing
- does not respond to other pigs in the pen
- off feed and water

TYPES OF DISEASES

There are two general types of diseases that affect pigs, non-infectious and infectious.

**Non-Infectious Disease** is not caused by a bacteria or virus, and is usually not spread to any other animal or human. Many of these types of disease are within the farmers control to correct the problem.

**Infectious Disease** is one that is caused by an infectious agent like a virus, bacteria or parasite. A CONTAGIOUS disease can be passed
from pig to pig, from human to pig, from pig to human!!

Let’s look at the chart below:

<table>
<thead>
<tr>
<th>Non-Infectious Diseases</th>
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<tr>
<td>Trauma or injury</td>
<td>Parasites- External-lice or mites</td>
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<tr>
<td>Birth defects (congenital abnormality)</td>
<td>Internal-worms</td>
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<tr>
<td>Allergies</td>
<td>Micro-Organisms- Bacteria</td>
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<td>Neoplasms (cancers)</td>
<td>Virus</td>
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<tr>
<td>Nutritional imbalances or deficiencies</td>
<td>Mycoplasmas</td>
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<tr>
<td>Stresses- management or production</td>
<td>Fungi</td>
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<tr>
<td>Old age- degeneration of organs</td>
<td>Yeast</td>
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For the first part of this unit we will focus on **Non-infectious Diseases** and brainstorm around how we as the hog farmer can correct some of the problems, or what solutions we may have to these disease problems. These are by no means all of the problems that any swine barn can get in the barn, but hopefully we can bring a few of them to your attention so that you can recognize other problems that may arise.
ACTIVITY: Non-Infectious Disease Brainstorming

Every member of the group gets a piece of paper or a card that has a **Non-Infectious Disease** topic on it. You must find the other members of the group, sit together and look at the **problem** in your category and how you could fix them if you can - or do you need help? You have 10 minutes to complete your group discussions; don't forget to appoint a spokesperson for your group. We will discuss these topics at the end of your brainstorming session. Use this sheet to record your answers.

**Trauma and Injury:**

**Nutritional Imbalances and Deficiencies:**

**Allergies:**

**Old Age**

**Poisoning**

**Stresses- (Management or production):**
Signs of Trauma and Injuries

Bitten Tails: This problem can cost a swine operation big dollars if not handled immediately. As soon as you notice that an animal has been the subject of tail biting remove that animal from the pen immediately to prevent further damage. Treat the affected animal promptly with the appropriate medication to prevent infection. If you notice that there is one pig that seems to be doing the biting, remove that animal from the pen. This behavior is on the rise also due to housing methods. Being housed on concrete, the pigs cannot participate in the normal rooting behavior of their species and the environment provides them less stimulation.

Nutritional Imbalances and Deficiencies:
The most common problem if the swine diet is not correct is loss ___________. The pig becomes weak and unthrifty looking with a poor hair coat and no interest in its surroundings. Evaluate each problem animal individually, and then look at the overall herd performance. If you find only one animal that appears to be doing poorly there may be an underlying disease causing the problem, (e.g. cancer, old age, poison) or that animal may be being bullied away from the feed. The pig needs to be removed from the pen for further examination to determine the cause of the problem and if the animal is viable and able to be saved.

HOWEVER, if all of the pigs in the pen do not measure up, the manager needs to take action to correct the problem immediately.
HEALTH
Contagious/Infectious Diseases
Leader’s Information

Suggestions to Begin this Section:
- If the Birth Defect research activity was given at the previous meeting, go around the room discover what the members have found out about Birth Defects in swine. Hand out the sheet in the previous that has the correct information on these defects.
- Introduce the topic of Contagious/Infectious disease in swine. Inviting a Veterinarian to come in this week to talk about some of these diseases would be helpful, as they would have the most up to date knowledge of the important diseases in swine herds at the present time. Have a question and answer period and a thank you for attending.
- Give a reminder of record keeping booklet updates.

Activity: Bacteria Transfer Experiment (on page 16)
Supplies Needed: Cooking oil, cinnamon, water-cold and warm, soap.
Activity – Bacteria Transfer Experiment

Supplies:
Cooking oil, cinnamon, water-cold and warm, soap.

In this section there was a lot of talk about SANITATION! What roll do you as the farmer have to play in disease transmission? Let’s try this quick experiment and see what results we get.

Three members are needed to demonstrate this experiment.

Procedure:
1. Rub 1 tablespoon of cooking oil all over your hands until they are completely coated. Sprinkle 1 teaspoon of cinnamon on hands and rub it around until it’s evenly disturbed. The cinnamon will act like bacteria. It’s all over your hands!
2. Wash hands as follows, rubbing them briskly for 20 seconds…

   Volunteer #1 washes hands in cold water with no soap.
   Volunteer #2 washes hands in warm water with no soap.
   Volunteer #3 washes hands in warm water with soap.

Have the group observe what is happening to each volunteer’s hands. Record the results.

The most effective method of removing the bacteria was ______________

The least effective method of removing the bacteria was ______________

My Conclusions are…
I can remove bacteria from my hands by:
Using_________water, ___________and by using _____________.

How does this activity demonstrate the need for superior SANITATION when handling livestock?

Why? When might this be especially important?

Conclusion drawn:
The most effective way to control the spread of infectious disease in the barn from animal to animal or animal to person is to be very careful about hygiene. This is especially true when handling sick animals.

The most effective way to remove the bacteria was warm water and soap.
The least effective way to remove the bacteria was cold water with no soap.
HEALTH

Contagious/Infectious Diseases

Our focus during this meeting is on some of the CONTAGIOUS DISEASES in SWINE.

There is no possible way to cover every disease in this project. On “ThePigSite.com and Ontario Pork there are over 251 swine diseases listed!! We can however present you with the most common and how best to manage them. Infectious diseases cost swine producers in Canada approximately $650 million dollars every year. On a per pig basis the number is $7.00-$10.00 per pig produced every year.

For those of you who have a swine farm, what would the cost of one of these diseases be to your farm? That can add up to a lot of lost dollars if any of these villains take control of the swine barn.
**Contagious/Infectious Disease**

**E. Coli:** or technically known as COLBACILLOSIS. The digestive systems of ALL animals including humans are home to billions of essential bacteria; E.coli is one of these essential bacteria that are naturally occurring.

Most types of E. coli do not cause illness in healthy animals or humans. E.coli is the most common intestinal tract disease in piglets up to one week of age. The other term for E.coli is Baby Pig Scours or White Scours. When the bacteria of E.coli stick to the inside lining of the gut, they multiply and produce poisonous substances called toxins. These toxins cause fluid loss in the body and therefore dehydration.

**Symptoms in young piglets:**
- severe diarrhea
- weakness and depression, wasting and not wanting to nurse
- sunken eyes
- dehydration
- and if left untreated-death

Like a lot of “bugs”, E.coli has mutated over the years making it harder to treat. It has become resistant to many of the original medications that could once cure the problem. E.coli- is now a “super bug” and that brings with it super problems for the farm. Antibiotics may help to lessen the severity of the disease process, but may not eradicate it altogether.

**Prevention:**
1. Strict sanitation in the farrowing area. A thorough washing and disinfecting between each litter of piglets. This helps to reduce the number of bacteria present. Raised, dry, clean floor in the farrowing crate area can prevent contamination of the piglets.
2. Provide a suitable environment for piglets that is warm, dry and draft free. Chilled piglets are slow to move and may or may not get enough colostrum from the sow to provide proper immunity. This would make it more likely for that piglet to become infected with E.coli.
3. Immunity (the ability to resist infection or disease). Piglets get their immunity from the antibodies in mother’s first milk (colostrum). The number of antibodies the piglet will get depends on the vaccination and health practices that the sow has received prior to farrowing.

Because E.coli has developed into a **“super bug”** there are new studies that consider introducing a PHAGE (bacteriophage), a virus that attacks the E.coli bacteria only and leaves the good bacteria alone. This would be given to the pig orally through their feed. These PHAGES are considered alternatives to antibiotic treatment.
**Coccidiosis (Coccidia):**

Coccidiosis is caused by a small parasite that multiplies inside the cells lining the small intestines. As the parasite goes through its lifecycle it destroys the lining of the small intestines. This reduces the ability for the intestine to digest and absorb nutrients from the feed. This disease is common and widespread in sucking piglets. It is occasionally seen in growing and finishing pigs as well, especially when the animals are moved or housed in continually populated and infected pens.

Coccidiosis should be suspected if there is a diarrhea problem in sucking pigs from 7-21 days of age. Coccidiosis does NOT respond to antibiotics, and there is NO vaccine to prevent this disease.

**Symptoms**

**Sows:**
There will be NO symptoms in the sow as she is the carrier of the disease.

**Piglets:**
- Piglets will have diarrhea as the major early sign of the disease. In later stages of the disease the diarrhea will change in colour from yellow to gray green or bloody according to the severity of the condition.
- Dehydration is very common in young piglets.
- Piglets are unable to gain weight because of the diarrhea and dehydration so their bodies waste away. They look thin and sunken in.

**Weaners and Growers:**
This age of piglet will also have diarrhea. They will show poor growth rates.

**Causes/Contributing Factors:**
- Dirty pens
- Poor hygiene in the farrowing pens.
- Wet floor surfaces or floors that are in poor condition i.e. Cracks
- Creep feeding on the floor, where the animals can eat more of the oocysts (eggs that are part of the disease lifecycle).
- Flies
- Continually used housing without cleaning and disinfecting.

_The best defense against this disease in your barn is STRICT SANITATION!_

**Atrophic Rhinitis (AR):**

Rhinitis is inflammation of the tissues inside the nose. This disease in a mild form is very common. During the process of infection the delicate nasal cartilage becomes damaged and may shrink up or distort. If
breeding females were infected with AR early in life, they will have a distortion of the face.

There are 2 forms of the disease: the *mild and non-progressive* infection or irritation occurs during a period of 2 to 3 weeks. The inflammation does not progress and the nasal bones repair themselves and return to normal. The more serious form of the disease is “*Progressive Atrophic Rhinitis (PAR)*. Toxin producing strains of the bacteria *Pasteurella multocidia* is present in the herd causing a progressive inflammation and subsequent damage to the nasal passages. This disease can interfere in both sucking and growing pigs.

ALL herds will show some degree of non-progressive atrophic rhinitis.

**Symptoms**

Sows:
There will likely be no clinical symptoms in a mature sow. However, they may carry the pasteurella organism, which under stress can shed to her piglets and may cause the piglets a more severe problem. If the sow had the progressive disease as a growing animal, there may be some distortion of the face.

Piglets, Weaners and Growers:
- Early signs can be seen in sucking pigs, like sneezing, snuffling and a runny nose.
- Sneezing can also sometimes show bloodspots.
- Young pigs may have runny eyes with tear staining and/or conjunctivitis (redness in the whites of the eyes and swelling).
- There may begin to be a twisting, shortening and wrinkling of the nose and upper jaw as the bones of the face become affected by the disease.

All of the above factors will cause a young pig to reduce its feed intake, therefore there would be a reduction in weight gain. They would develop poor body condition, which in turn would leave them vulnerable to other diseases such as Pneumonia.

**Causes/Contributing Factors:**
- The disease is more prevalent in young herds, particularly those containing large numbers of gilts.
- Large permanently populated farrowing houses.
- Multi suckling increases the spread of the infection.
- Poor ventilation and low humidity.
- Dusty atmosphere can predispose the development of the disease.
- Toxic gases can predispose the pig to the development of the disease.
The presence of diseases such as Enzootic Pneumonia (EP), Porcine Reproductive and Respiratory Syndrome (PRRS), and Aujeszky’s disease leave an animal already compromised, and therefore more susceptible to Atrophic Rhinitis (AR).

**Good management, (clean barns that are not overcrowded, warm draft free air and the use of vaccines) will help to keep this disease in check.**

**Transmissible Gastroenteritis (TGE):**
TGE is a viral disease that produces diarrhea and vomiting in all ages of pigs. Outbreaks of this disease can be severe with mortalities of 100% in nursing pigs up to three weeks old. Because this disease is a virus there is no effective treatment.

**Symptoms:**
- Diarrhea that is severe in nursing litters and milder in older animals in the barn.
- Vomiting in pigs of all ages.
- Reduced feed consumption.

Older pigs usually recover within a few days, but piglets that do survive are stunted and gain weight slowly. This slow progress is due to damage done by the virus to the intestines.

**Causes/Contributing Factors:**
- A “healthy carrier” often brings this virus into the barn. An apparently normal animal that had been infected at one time and now sheds the virus.
- The virus is also what is termed “tractable”, meaning vehicles, birds, dogs, cats, air and people can spread it.
- The virus can live for several days on manure and body secretions, and for several months if frozen.
- The virus can become endemic (particular to a specific barn or farm) in the barn and produce chronic diarrhea and high rates of mortality, especially in the nursery.

**BIOSECURITY is your best defense against this virus entering your herd. Also be sure to buy in new livestock from known free TGE herds. Be sure that all transportation vehicles are cleaned and disinfected. Never transport feed or grains in the same vehicle that pigs have just traveled in. In other words BEST MANAGEMENT PRACTICES at all time by every member of the team involved in the barn management.**
PMSW, or Post Weaning Multisystemic Wasting Syndrome is a disease that has become of great concern in Canada the USA and Europe. The disease is associated in part with Porcine Circovirus (PCV) because its DNA is very similar. This disease erupted in epidemic proportion in Ontario and Quebec in the fall and winter of 2004. Why such a violent eruption occurred is not understood, but it did spur researchers, farmers and other groups to look more closely at their farm practices to gain a measure of control.

Symptoms:
Weaners and Growers
- Slow and progressive with a high mortality rate in affected pigs
- Begins at about 6-8 weeks of age, weaned pigs lose weight, become emaciated, their hair coat is rough; skin is pale and may appear to be jaundiced.
- Sudden death.
- Enlarged lymph nodes
- May have diarrhea
- May have respiratory distress
- Uncoordinated
- Clinical cases may keep occurring in a herd over many months, reach a peak after 3 months and then gradually decline.

Causes and/or Contributing Factors:
- Infected faeces
- Mechanical means via clothing, equipment, trucks etc.
- Possibly birds and rodents
- Circovirus has been detected in semen of apparently healthy boars.
- Mixing and stress
- Continual production
- High stocking density

Diagnosis:
It is difficult to diagnose this disease, as most herds will have some antibodies to PCV, so blood testing will not help to narrow down the disease. This problem is also hard to diagnose, as it resembles many other diseases that swine may get. It is likely that many small mild outbreaks go undetected. The best method to date of obtaining an accurate diagnosis is an autopsy to look at the major organs and tissues for lesions (especially those in the lymph system).

New vaccines are being developed but are not in wide use at this time, because the strains of the disease are mutating. It is hoped that by developing a vaccination program in the farrowing herd, that the passive immunity will protect the weaner and grower pigs.
PRRS- Porcine Reproductive and Respiratory Syndrome
The VILLIAN of all Diseases!!

This swine disease was first discovered in the 1980's in the US. It was called the “mystery swine disease” or “blue ear disease”. The virus seemed to be of undetermined cause at that time but it was noted that it did spread from pig to pig.

There has been much study on this disease and more is known today. However, as of the date of writing this project there is still no effective treatment. This disease has the great capability to mutate just when researchers think they have it figured out. It has a liking for the normal macrophages that are found in the swine lung. The virus multiplies and devours the normal macrophages leaving behind debilitating disease. The cost to Canadian swine producers is upwards of $650 MILLION dollars annually.

Symptoms
Sows:
- Increase in the number of stillborn piglets- 25-35%
- Mummified fetuses
- Weak new born piglets
- Premature farrowing
- Anorexia in the lactating sows lasting 1-4 months depending on the initial health status of the sow.
- Fever in the lactating sow
- Ears may appear blue on the sow and she may have some skin discoloration
- Cough
- Long term this disease may render the sow sterile or at the very least unable to re breed for 4-8 months.

Newborns:
- Infection suppresses the immune system of the piglet
- Respiratory disease, a thumping respiration pattern.
- Mouth breathing
- Chronic weight loss, daily gains decrease by 85% and mortality increases by 10-25%
- Disease process crosses the placental barrier in the 2nd and 3rd trimester

Post Weaning:
- Nasal discharge
- Laboured breathing
- Depressed appetite with accompanying weight loss or poor gain.
- Susceptible to other diseases as they are immune compromised
- Increased mortality rate
- Undersized, stunted growth, which can cause losses of $7-10 per pig in production.
Treatment:
There is no totally effective treatment at this time. This disease has the ability to mutate. Prevention appears to be the primary control source at this time. Test all gilts and boars to be sure they are not carrying or shedding this virus. Isolate any new animals for 45-60 days and be sure to test them to determine their status.

*There are now various vaccines available on the market BUT they are only effective if given BEFORE PRRS exposure!!*

One of the vaccines must be given at a dose of 2ml IM between 3 weeks and 18 weeks, and only if they are disease free.

This is much like a human getting a flu shot. The flu shot changes every year, and if you are ill, they will not give you the shot until you are feeling better.

The best defense against this disease in your herd is:
- Biosecurity
- Quarantine or complete herd closure
- Test and quarantine all incoming animals
- Test all semen used on the farm, as the virus can be shed into the semen.
- Shower in and shower out protocol for all barns
- Personal downtime with no swine contact for 1-72 hours.

The farm should combine testing and removal of infected breeding stock and partial depopulation of weaned pigs and any animals that appear infected. It could take up to 2 years to eradicate and get the herd to disease free status again. Watch for other possible sources of disease transmission such as:
- Needles
- Fomites (coveralls, boots, hands of personal)
- Aerosol transmission- ventilation systems, outside air
- Mosquitoes or other mechanical vectors, birds, rodents
- Mechanical incidence such as fluctuations of temperature that increase stress on the animals.
HEALTH
Injections and Medications
Leader’s Information

Suggestions to Begin This Section:
• Do the Roll Call question from the list if you choose.
• The two hot button diseases at the time of writing this project are in this section. These diseases are deadly to a herd and costly to the farm that contracts them in their barn. Talk about these diseases. Have any members had these diseases hit their barn? What action was taken? What was noticed within the herd?

ACTIVITY: Rules for Injecting Pigs Questionnaire (Member’s section page 25, answers page 26)

ACTIVITY: Giving an Injection (Leader’s tips on page 27, Member’s sheets on pages 29 and 30)

Supplies Required: Needle barrels of different sizes, needle ends of different sizes and gauge, oranges, coloured water.
SOME RULES FOR INJECTING PIGS:

- Do not give injections into the ham. Why?

- Avoid injecting through dirty skin. What might this cause?

- If a disinfectant is used to clean the needles and syringes, rinse thoroughly before using. If this was not done what could you cause?

- Inject small amounts of medication at one site. No more than 10cc for an adult sow or boar and 2cc in baby pigs. What could overdoing these amounts cause in the animal?

- Change needles at least every litter or every 10 pigs. Why?

- Change needles when bent, dull or contaminated with manure. Why?

- Do not straighten or reuse a bent needle. What might this cause?

- Clean needles and syringes with hot water between uses, or better yet, use disposable needle tips and wash the barrels between uses. What would this practice prevent?
Answers for Rules for Injecting Pigs:

- **Why not give an injection into the ham of the pig?** It is the most valuable part of the carcass for meat and you do not want scar tissue or bruising to be found in this area of the animal. The animal could be severely discounted at market or not used at all. Money lost to the farmer.

- **Injecting through dirty skin?** Run the risk of introducing infection through the skin and into the body, which may develop into a disease process.

- **Injecting small amounts of medication into one site?** If you overdo the amount of medication in one site there are a few issues. One of the issues is tissue damage at the injection site. Too much medication all in one site can also cause skin lumps that may or may not go away. This would cause a discounted carcass, as the lumps would be visible on inspection.

- **Changing needles at least every litter or 10 pigs?** A few reasons for this practice are that needles become dull after repeated use. This can tear the skin of the animal very easily. Needle ends tend to develop little barbs on them from repeated use. You also run the risk of transferring infection from a sick animal to a healthy animal without knowing it.

- **Changing needles when bent, dull or contaminated?** Using bent or dull needles can lead to the needle end breaking off in the animals skin. This will set up a host of problems for you as the farmer. If the broken end cannot be taken out you must mark the spot on the animal where it is and record the incident. You must then contact your marketing agency with the information prior to shipping this animal. They have the right to refuse this animal. Any kind of contamination whether manure, blood, or dirt of any kind can set up an infection in the injected animal.

- **Do not straighten bent needles.** A bent needle is weak; by straightening it you make that needle weaker and run a greater risk of breakage.

- **Cleaning needles and syringes or using disposables?** This practice will go a long way to prevent the spread of disease and infection in a herd. It will also minimize the risk of broken needles in carcasses. If a disinfectant is used rinse thoroughly. First of all if you are using a disinfectant to wash your syringes and needles, be sure it is a disinfectant that is approved for use as stated by your contract or manual. Next, if you do not rinse well some disinfectants will leave behind a residue that can react with your injectable medications. This is a form of contamination and may cause problems for the animal injected.
Activity – Giving an Injection

Supplies:
Needle barrels of different sizes, needle ends of different sizes and gauge, oranges, coloured water.

Using the guide for proper placement of injection and recommended size of needle and gauge have the members practice injecting an orange. The orange can be cut into half or quarter depending on how many members you have. Have a senior member or possibly another adult present to ensure that this is done safely with no mishaps. Stress in the beginning of this exercise that this is not a game and anyone caught misusing the equipment in any way will be asked to leave the room, or at the least sit out and no longer touch the equipment provided. If you do not have any of the necessary equipment on hand you can readily find these items at your local feed store, veterinary office, or possibly a farmer that lives near by. Have members study the picture of the injection sites.
HEALTH

Injections and Medications

ABOUT INJECTION PROCEDURES:

- Read the product label, it will recommend how the medication is to be given.
- Observe and note the withdrawal times for the medication that is to be given. This withdrawal date must be recorded as it is unsafe and against the law to ship any animal that has active medication in its system.
- Consult your veterinarian on proper use of all drugs. If your veterinarian recommends a dosage or administration procedure that is different from the label directions, the withdrawal time also may change. Depending on your contractor, you may need a written prescription from the Veterinarian stating their recommendation and the withdrawal time they recommend.

What term for use of medication is NOT listed on the bottle?

ABOUT NEEDLE GAUGE and LENGTH:

Just like with any other job, you need the right tool to do the right job and to do a good job. This especially applies to administering injections to livestock. The higher the gauge number of a needle tip the thinner (finer) the needle. This type of needle end will also have a smaller bore (opening). The finer needles are normally used for subcutaneous injection so as not to harm delicate skin tissues. These needles also tend to be shorter in length. E.g.: SQ gauge would likely range from 16 (thicker) to 20 (finest) and in length from ½” to ¾”.

The lower gauge numbers mean that the needle is thicker and the bore (opening) is wider. Often medications that are given into the muscle are thicker; therefore you need this bigger needle and opening to allow the medications to pass into the muscle easily, minimizing any damage to surrounding tissues. E.g.: IM needles tend to be 16 (thicker) to 20 (finer) and range in length from 5/8” to 1 ½”.
ACTIVITY: Giving an Injection

We will practice **Subcutaneous Injections** first (SQ).

The needle is to be inserted at an angle to avoid reaching the muscle.

- $\frac{1}{2}-\frac{3}{4}$” needle for pigs less than 4.5kg.
- $\frac{3}{4}-1$” needle for pigs over 4.5kg.

Most SQ injections are given using shorter needles, so you don’t enter the muscle by mistake, and also the gauge (bore) of the needle tends to be smaller so as not to damage delicate skin tissues.

With an orange cut in half so you can see where the coloured water is going, practice inserting the needle through the rind of the orange. The coloured water should not enter the pulp part of the orange or you have put the needle in too far.

If the type of orange used has the thick white membrane you may see just a small amount of colour. If you were actually using the hide of an animal or human you would see the medication form a small bump on the skin as shown below.
Now let's practice **Intramuscular Injection** (IM).

The needle is directed straight into the skin in order to reach the muscle. 

1”x18-20 gauge needle for pigs up to 11.5kg.

1” or 11/2” x 16-18 gauge needle for larger pigs. IM injection needles tend to be longer so they will reach into the muscle area of the pig. The bore (gauge) will likely also be larger as this type of injectable medication tends to be thicker.

With your orange cut into pieces, practice putting the needle straight into the orange part and injecting the coloured water. The needle should go in straight up and down and all the dye should show up in the pulp of the orange. Notice how much more difficult it is to inject the liquid. It will likely require you to use very firm pressure to get the “medication” all into the “muscle” of the orange.

Look at the diagrams shown here for technique and sites to be used on pigs.
HEALTH

Other Ways of Giving Medications

Suggestions to Begin this Section:
- Do the Roll Call question from the list or one of your own.
- Try to bring in a castrator, tail docker and ear tags, notchers or tattoo guns used on swine to show to members.
- This section covers other routes of medication administration, what each is, and how it is done. How to calculate dosing for various sizes of animals will be discussed as will safe storage and handling of medications and medicated feeds.

Activity: Water Calculation Activity (located on page 36).
The solution to this calculation is:
The pigs in this example would require 200L of water per day.
The amount of medication required for the 100 pigs according to manufacturers instructions would be 180gm.
HEALTH

Other ways of giving medications

There are four other methods to administer medication to animals or humans besides the two injectable methods we covered at the last meeting.

These four methods are:

1. **Oral**- as given in water, feed or as a drench.
2. **Inhaled**- as a spray used in the mouth or nose.
3. **Topical**- as with salves, cream and ointments
4. **Passive Transfer**- that a piglet would get when born from a vaccinated sow and immunity to some disorders are passed through the milk to the piglets. This protection is short term in nature.

### Sample Dosage Calculation Table

The following table is presented to provide you with a guideline for calculating dosages. The doses presented are for 1ml/10kg and 1 ml/15 kg.Weights have been included both in pounds and in kilograms. This is a guideline only, and is intended to assist you in the calculation of dosage amounts for your animals. Medications are administered at various dosage rates. You must refer to label directions or, if applicable, veterinary instructions for the administration of medications.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Weight (lbs)</th>
<th>Dosages</th>
<th>Weight (kg)</th>
<th>Weight (lbs)</th>
<th>Dosages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1ml/10 kg</td>
<td>3ml/45 kg</td>
<td>1ml/10 kg</td>
<td>3ml/45 kg</td>
</tr>
<tr>
<td>5</td>
<td>11.3</td>
<td>0.5</td>
<td>0.3</td>
<td>120</td>
<td>270.0</td>
</tr>
<tr>
<td>10</td>
<td>22.5</td>
<td>1.0</td>
<td>0.7</td>
<td>125</td>
<td>281.3</td>
</tr>
<tr>
<td>15</td>
<td>33.8</td>
<td>1.5</td>
<td>1.0</td>
<td>160</td>
<td>360.0</td>
</tr>
<tr>
<td>20</td>
<td>45.0</td>
<td>2.0</td>
<td>1.3</td>
<td>165</td>
<td>371.3</td>
</tr>
<tr>
<td>25</td>
<td>56.3</td>
<td>2.5</td>
<td>1.7</td>
<td>170</td>
<td>382.5</td>
</tr>
<tr>
<td>30</td>
<td>67.5</td>
<td>3.0</td>
<td>2.0</td>
<td>175</td>
<td>393.8</td>
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<tr>
<td>35</td>
<td>78.8</td>
<td>3.5</td>
<td>2.3</td>
<td>180</td>
<td>405.0</td>
</tr>
<tr>
<td>40</td>
<td>90.0</td>
<td>4.0</td>
<td>2.7</td>
<td>185</td>
<td>416.3</td>
</tr>
<tr>
<td>45</td>
<td>101.3</td>
<td>4.5</td>
<td>3.0</td>
<td>190</td>
<td>427.5</td>
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<tr>
<td>50</td>
<td>112.5</td>
<td>5.0</td>
<td>3.3</td>
<td>195</td>
<td>438.8</td>
</tr>
<tr>
<td>55</td>
<td>123.8</td>
<td>5.5</td>
<td>3.7</td>
<td>200</td>
<td>450.0</td>
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<tr>
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<td>6.0</td>
<td>4.0</td>
<td>205</td>
<td>461.3</td>
</tr>
<tr>
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<td>146.3</td>
<td>6.5</td>
<td>4.3</td>
<td>210</td>
<td>472.5</td>
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<tr>
<td>70</td>
<td>157.5</td>
<td>7.0</td>
<td>4.7</td>
<td>215</td>
<td>483.8</td>
</tr>
<tr>
<td>75</td>
<td>168.8</td>
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<td>5.0</td>
<td>220</td>
<td>495.0</td>
</tr>
<tr>
<td>80</td>
<td>180.0</td>
<td>8.0</td>
<td>5.3</td>
<td>225</td>
<td>506.3</td>
</tr>
<tr>
<td>85</td>
<td>191.3</td>
<td>8.5</td>
<td>5.7</td>
<td>230</td>
<td>517.5</td>
</tr>
<tr>
<td>90</td>
<td>202.5</td>
<td>9.0</td>
<td>6.0</td>
<td>235</td>
<td>528.8</td>
</tr>
<tr>
<td>95</td>
<td>213.8</td>
<td>9.5</td>
<td>6.3</td>
<td>240</td>
<td>540.0</td>
</tr>
<tr>
<td>100</td>
<td>225.0</td>
<td>10.0</td>
<td>6.7</td>
<td>245</td>
<td>551.3</td>
</tr>
<tr>
<td>105</td>
<td>236.3</td>
<td>10.5</td>
<td>7.0</td>
<td>250</td>
<td>562.5</td>
</tr>
<tr>
<td>110</td>
<td>247.5</td>
<td>11.0</td>
<td>7.3</td>
<td>255</td>
<td>573.8</td>
</tr>
<tr>
<td>115</td>
<td>258.8</td>
<td>11.5</td>
<td>7.7</td>
<td>260</td>
<td>585.0</td>
</tr>
</tbody>
</table>
It is very important that each farm have its own comprehensive vaccination and drug administration plan as well as safe storage practices. There must be a log of every medicated item used on every animal on the farm. This practice is in accordance with the CQA or any other Contract Provider. There are products on the market that are not approved by some Contract Providers and therefore the farm must know what is and is not allowed for use on their swine under their shipping contract. If the animal is being shipped to another facility for finishing, the treatment records or copies of them must accompany the animal.

**DRUG STORAGE:**
All drugs used on the farm must be stored according to manufacturer’s instructions. This will insure that the medication maintains its integrity and that when it is given to the animal it will be effective.

1. Store drugs in a clean, dark cupboard or refrigerator (according to label directions).
2. Check to be sure that your refrigerator is between 2 and 7 degrees Celsius.
3. Check all expiry dates on all drugs regularly and discard all drugs that are past the expiry date. Discard all drugs that have changed in appearance (i.e. discoloured or thickened).
4. Never put a needle back into a medication bottle after it has been used on a pig. Use one needle in the top of the medication to fill the syringe and another needle to actually inject the animal.

**WATER MEDICATION:**
- The use of water medication is a convenient way to deliver medication to large groups of animals. When animals are already sick water consumption is also more likely to occur than feed consumption.
- Water medication must comply with your farm plan and contract protocols. Read the manufacturers directions carefully to ensure proper dosing of the medication.
- When calculating dosages for water medication keep in mind that pigs consume a volume of water equal to approximately 6-10% of their body weight per day. If necessary weigh a sample of the pigs to be treated to get an estimated body weight.
- Water medicators must be calibrated on a regular basis. Follow the manufacturers instructions carefully to ensure that it is delivering the volume of medication that is required. Make any necessary adjustments and keep RECORDS.
- When using a water meter keep in mind that water evaporates thereby changing the amount of medication given to the animals. The consumption rate of water by the pigs will increase if the barn is hot. If pigs are sick and have diarrhea they will drink more than usual. You need to look at all these factors to determine how best to medicate these pigs.
- It is recommended to only mix enough medication for one day.
and to dose the medication over 8 hours of time.

- Remember to turn off the regular water supply if necessary, when supplying medicated water and to turn the regular water on again when the dosing is finished.
- It is not necessary to use a water medicator to distribute water medication. You can mix and deliver medicated water by hand to a trough. If you choose to deliver the medication this way remember to read the instructions carefully and calculate your dosage.

### Estimated Water Intake for all ages and stages:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Weight (kg)</th>
<th>Intake (L/per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestation</td>
<td>Variable</td>
<td>Variable</td>
</tr>
<tr>
<td>Lactation</td>
<td>12 to 20</td>
<td></td>
</tr>
<tr>
<td>Piglets</td>
<td>Variable</td>
<td></td>
</tr>
<tr>
<td>Weanling</td>
<td>5 kg</td>
<td>1.0 to 2.0</td>
</tr>
<tr>
<td>Weanling</td>
<td>7 kg</td>
<td>1.5 to 2.5</td>
</tr>
<tr>
<td>Finisher</td>
<td>15 kg</td>
<td>2.5 to 3.5</td>
</tr>
<tr>
<td>Finisher</td>
<td>25 kg</td>
<td>3 to 4</td>
</tr>
<tr>
<td>Finisher</td>
<td>50 kg</td>
<td>5 to 7</td>
</tr>
</tbody>
</table>
Prominent Pump & Meter Setup

Figure #1: Bypass Setup

Water meters must be installed upright and horizontal for them to work properly.

Figure #2: Water Meter Reading

- Each number roll-over represents 1000L of water flow
- For X0.1 each number represents 100L
- For X0.01 each number represents 10L
- For X0.001 each number represents 1L
- For X0.0001 each number represents 100ml
- Read only to full numbers and in clockwise direction
ACTIVITY:
We are now going to do a sample calculation of how much water medication to give to our pig.

Bacterial Pneumonia in Pigs

The directions for treating respiratory disease with a brand of Oxytetracycline, HCL (Hydrochloride), and Neomycin that is provided in a 100 gm pouch is:
“200 gms (2 pouches) per 225 L of drinking water for 4 to 5 days”. 
The precautions state- “prepare fresh solution each day”.

The 100 pigs in the pen average 20kg and each should drink between 1.2 and 2L (6-10% of it’s body weight) of water per day. If we use 10% the whole group they would require _____L of water per day?

(# of pigs x weight per pig x 10% = _____)
Calculate the amount of medication required for this amount of water, according to the manufacturers label directions.

It is very important that you never over or under medicate. Medication directions must be followed accurately or damage to livestock or consumers could occur.
CQA does not allow ANY form of off label medication.

MEDICATED FEED:

Medicated feed provides even more challenges for the swine farm than medicated water. The Canadian Food Inspection Agency (CFIA) routinely tests livestock products at processing for residual medication. Canada has been found thus far to be approximately 99.6% residue free. This is an excellent marker. This high standard speaks well of the conscientious farmers and managers as well as good farm practices and record keeping. However, there are many steps and precautions that are needed to maintain this standard.

All feed medications used in Canada must be approved by the Veterinary Drug Directorate of Health Canada. These approved products will bear a Drug Identification Number (DIN) and will be listed in the Medicating Ingredients Brochure (MIB). Medications that are listed in the MIB present no problem related to drug residues. To receive approval they are thoroughly researched to show they did not leave residue in the meat when the appropriate withdrawal time was applied. Regulations also require that feed mills properly tag bagged feeds with a label that shows what type of animal it is to be fed to and what the withdrawal period is. Bulk feeds must be accompanied by a detailed label/tag.
Most decisions about whether or not to add a particular type of feed medication will be made through consultation with the herd’s veterinarian. Also your medication program MUST fall into the parameters of the farm contract system.

Most contracts will provide the producer with what is and is not allowed for use under their system.

**ON FARM MIXING** of medicated feed requires close monitoring. The mill calibration is the first step in being sure that the correct amount of medication is mixed into the feed. The order the ingredients are added, the amount of mixing time and the distribution system for feeding the medicated feed, all have an impact on how the producer can best deliver the medicated product. Concerns with regards to feed mixing and delivering it to the animals goes beyond cross-contamination by medications. Producers must remember that,

A. Animals, birds or other organisms if stored incorrectly may contaminate improperly stored feeds and feed ingredients.

B. Medicated feeds are prime targets for growth of molds and fungi.

C. Storage areas must be maintained and all bins well marked to ensure the feed ingredients are properly maintained. Mark your bins well so there is no confusion as to what the bin contains.

D. Feed mixing and distribution equipment must also be maintained and inspected routinely to avoid cross-contamination by medicated feed as well as by biological hazards. Flush your mixing system regularly following the mixing of medicated feed.

E. KEEP RECORDS of all medicated feed on the farm (when and how it is being fed to the animals). Also be sure that the withdrawal time is recorded and strictly adhered to.

**PURCHASED FEED:**
The purchase of a complete feed, premixes and supplements or other feed ingredients from commercial feed mills offers a different set of risks to consider.

- Discuss with your mill how they handle complete feed and feed ingredients to prevent contamination. Be sure of their quality control program. Do they have HACCP or ISO certification?
- Be sure all feed bins are clearly identified and provide that identifier to your feed mill.
- Producers must check each feed delivery slip, tag and initials carefully within 24 hours of delivery. If there is any doubt about the correct feed being delivered, (if the feed appears, smells or if the texture is different), you can refuse delivery. Also before feeding you can have the feed ingredient tested to be sure it is safe to feed
- All Master formulas (recipes) for rations must be kept for a period of two years from the last date of manufacture. All veterinary
prescriptions given to the herd for medication in feed must be kept on file for one year.

- You can also keep a small sample of the feedstuffs in the freezer for future testing if there may be questions or issues surrounding the medicated feed.
- Keep tags on file. These tags for medicated feed should contain the date the prescription was written, name and address of the client, name and level of medication in the feed and any special manufacturing instructions. Feeding directions including the number and type of animal to receive the medication, caution and warning statements where applicable, signature of the veterinarian and the client’s signature indicating an understanding of the prescription being used in the farms feed.

**DRUG DOSAGE AND WITHDRAWAL PERIODS:**

All drugs manufactured and sold in Canada are required by law to include specific information on their labels. Most manufacturers also provide an insert, which gives the producers more information that will not fit on the label. Labels become soiled or can come off of bottles so consider keeping a file of package inserts that are used on the farm.

Extra-label drug use happens any time that you do not follow the directions on the label. This can be the dose given, the route a medication is given, the length of time the treatment is given, the species or age of animal the medication is given to, or if the medication is given for a purpose other than that stated on the label.

When extra label use happens, the withdrawal times for the product will differ. Be sure to handle treated animals appropriately. Pay careful attention to the directions provided by your veterinarian. Under the CQA off label use is NOT allowed under any circumstances.
Below are three other procedures performed on piglets for health reasons and identification ease for the farmer. Review these 3 procedures and discuss the benefits of doing them or not.

Castration: is a procedure done on all male pigs that are not being kept for breeding stock. This procedure is done at 7-10 days of age. An incision with a sterile scalpel to expose the testicles and remove them. Because most farms now use Artificial Insemination very few male piglets are ever not castrated.

Tail Docking is always done on piglets. This helps to reduce the incidence of tail biting. One third to one half of the tail is removed with disinfected side cutting pliers.

Identification can be done in a few different ways. One of the methods is notching. Each notch on the ear has a specific meaning within that herd. Ear tags are increasingly used. In addition, some producers will tattoo their animals.
HEALTH

Artificial Insemination

Suggestions to Begin this Unit:

• Do the Roll Call question from the list or one of your own choosing.

• This meeting will cover the topic of Artificial Insemination. Inviting an AI technician from one of the many Genetic Companies that are in Ontario today is a great way to cover this topic. They have lots of display material, handouts and other items on this subject. If you cannot find a technician in your area maybe one of the local swine farmers will come to help with this topic. A list of AI companies will be put into the reference section of this manual.

• This section will also cover different breeds of swine and some of the benefits and drawbacks of crossbreeding swine.

• This meeting is also a good time to review a few of the diseases that were covered earlier in the project.

• The members also need to have their workbooks looked over, cover any problems with their project animal that they may be having, how much time they are spending working with their project animal. Be sure everyone knows when and where the achievement day is going to take place. Be sure the members know where their project swine is going once the achievement day is over.

Activity: Review Questions (page 41)

Activity: EBV Calculation Exercise (on page 50)
ACTIVITY - REVIEW QUESTIONS:

1. A neutered or castrated male pig is called a gilt.

2. A pig whose parents are of different breeds is said to be a crossbred.

3. A female pig that has had at least one litter of piglets is called a gilt.

4. A piglet is a newborn pig.

5. A non-infectious disease cannot be transmitted from animal to animal.

6. A boar is a mature male pig.

7. A weaner pig weighs about 100kg.

8. The meat we get from a pig is called pork.

9. “Barrow” means to give birth to a litter of piglets.

ACTIVITY: Review Question Answers:

HEALTH
Artificial Insemination

Less than 10% of all swine farmers in business today keep an active boar on the farm. They may keep several barrows (neutered) pigs in the breeding herd for the purposes of heat detection so they can then artificially inseminate when the sows heat cycle is detected. Depending on the size of the herd you may have to house and feed many boars—this would increase housing cost, feed cost, electrical costs.

There are many reasons why swine farmers have switched to using AI on their sows:

- Larger genetic pool to draw from for herd health improvement, increased litter size and better quality carcasses.
- Lower incidence of disease introduced into the herd as all semen is rigorously tested for many diseases that plague swine herds today. Boars are harder to handle than sows and piglets. AI is a more cost effective alternative to keeping boars on the farm.
- By using AI you spare some stress on the sow of having a boar at her for days until the boar senses she is no longer in active heat.
- Swine producers are trained to do their own insemination and this helps reduce the risk of disease, and the sows and gilts respond better to someone they know than to a stranger.

The sows will be bred twice (double mated) 12-24 hours apart during her estrus. This increases the chances of the female conceiving and becoming pregnant.

*How do the AI units select our “Super boars”?*

Ontario Swine Improvement Inc. (OSI) is an organization that is devoted to the improvement of the swine industry in Ontario. OSI Genetics AI unit may maintain a group of 100 or more top quality purebred and crossbred boars from which semen can be purchased by swine farmers. There are at least 12 other licensed AI units in Ontario that also sell semen to swine farmers. Each year they weigh and backfat measure more than 50,000 boars and gilts for performance. Representatives from the company can go to breeding farms and electronically perform the testing and give the EBV's of the animals tested immediately.

These EBV numbers help with the selection of lean, fast growing, high producing swine that are needed to keep up with market demand for high quality lean meat. These units also test for the presence of diseases to help eradicate some of the most virulent of organisms on swine farms today.
So what are these EBV’s??

EBV stands for **Estimated Breeding Values**. These values are used to measure the genetic worth of an animal. EBV is used to rank an animal’s standard among its peers. EBV is used to choose the best genetically superior animals for mating purposes. EBV is an estimation of the genetic value of an animal for breeding stock. EBV takes into account the heritability of the trait, the genetic level of the herd the pig was tested in, genetic trends in the breed, the amount of information available on the pig and the influence of management on the animal’s performance.

So how do we get these EBV’s??

EBV values are available for a number of traits that are found in the animal. All of the numbers put together help producers and AI units select the best quality animals in the province for their breeding program.

- Backfat measurements adjusted to 100kg (mm)
- Days to 100kg of weight
- Loin eye area on measurement (sq. cm.)
- Carcass lean yield on slaughter (% dress)
- Feed conversion (kg/kg)
- Total number of pigs born per litter
- Disease free status
- Other traits as developed

EBV’s are designed to maximize economic returns by including the above traits. There are also a split in looking at the EBV numbers into two groups that of a-

**Sire Line Index (Terminal)**

Terminal usually means that all offspring from this line will go to market. The AI units look at and rank the animal for:

- Growth Rate- 45%
- Feed Conversion-37%
- Lean Yield- 16%
- Loin Eye Area- 2%

**Dam Line Index (Maternal)**

Maternal usually indicates that the line would be appropriate for use as replacement animals. The AI units look at the ranking of maternal animals for:

- Litter Size- 53%
- Growth Rate- 22%
- Lean Yield- 6%
- Loin Eye Area- 1%
Breeding Basics:

- Boars that are housed in the AI breeding barns are trained to mount a dummy.
- Hygienic techniques are used: boar is cleaned, gloves are worn, and sterile collection bags are used.
- There are also strict quality control guidelines in place for the handling of semen.

After semen collection the sperm is checked for motility, morphology and other quality controls. Sperm is a very perishable product, and its highest fertility time is when first collected. A sperm extender is put with the seminal fluid to prolong the life of the sperm.

The sample must have a minimum of 3 billion vigorous and healthy sperm cells for at least 4 days for the sample to be viable for use by the customer. Fresh semen must be used within four to five days of its collection. Currently about 70% of all semen used is used in the fresh state. Frozen semen however can be kept indefinitely, however studies have shown that frozen semen isn’t as viable as fresh and the sperm do not survive as long. They also freeze boar semen for species preservation or special breeding stock. Frozen semen results in about a 50-70% conception rate and a litter with 2 fewer pigs than with fresh semen.

The two main reasons for breeding failure are not catching the sow at the proper time in her cycle and storing semen incorrectly. Semen is very temperature sensitive so your storage unit has to maintain at a constant 16-18 degrees Celsius to ensure the best results.
ARTIFICIAL INSEMINATION

For Years the Goldenpig® has been Considered the Quality Standard in Disposable AI Catheters

Goldenpig®
More than 35 million inseminations are performed worldwide using the Goldenpig catheter
006957 (ZS778)

XL Goldenpig®
Longer than the conventional Goldenpig. Great for hands-free AI
016735

Goldengilt®
For gilts, we offer a smaller diameter, tapered, and longer sponge tip
016624

Deep Goldenpig®
Intravaginal insemination of low dose concentrations is possible
016311

The Number One AI Catheter, with Over 35 Million Inseminations Performed per year Worldwide.

The specific shape, texture of its foam and dimensional characteristics (internal and external diameters) make the Goldenpig the ideal catheter for the genital tract of the sow or gilt. It is easy to insert, no need to screw as with traditional spiral type catheters.

Easy to use, it decreases semen backflow without inhibiting the uterine contractions. The size of the tip makes it too large to penetrate the bladder area.

The yellow color is a registered trademark of IMV International Corp.
USPTO Reg. No. 2,222,162
This diagram allows you to see the interior of the sow, and the placement of the breeding rod that the semen will pass through.

**INTRAUTERINE INSEMINATION**

DeepGoldenpig™

*Take your AI doses farther...*

Reduce sperm concentration to 1 billion cells per dose with this tested combination. Over 3,000 sows tested in field trial.

1. Ovaries  
2. Uterine horns  
3. Follicles  
4. Uterus (site of semen deposition)

5. DeepGoldenpig  
6. Cervix  
7. Vagina

The use of the DeepGoldenpig™ for intrauterine insemination does not replace semen quality, good heat detection, AI timing, boar stimulation of the female during AI, good animal husbandry practices or good breeding sow management. In summary, all other details pertaining to good AI practices still need to be observed for the success of the intrauterine insemination technique.

HEAT DETECTION
- Group all weaned and repeat sows together in the service area.
- Accurate records are vital to identify problem sows early.
- Sows in the service area should have direct contact with a mature boar.
- Teaser boars should be rotated, ‘Variety’ is important.
- To obtain optimum performance from A.I., twice daily heat detection is essential.

SOW HANDLING AND STIMULATION
- Lactating sows feed-intake should be maximised in the last two weeks before weaning to speed up their return to estrus and maximise their ovulation rate.
- Feed sows to appetite during the weaning to service period to achieve a faster return to service.
- It is critical during Artificial Insemination to simulate the events which occur in a natural mating.
- Sows respond to tactile/audio/visual and odour stimuli.
- If a teaser boar is not available, then it is beneficial to use a synthetic boar odour.
- Gentle handling is essential in the service area. Stress leads to adrenaline release which has a negative effect on semen transport in the uterus.
- Boar contact should be maintained and the sand bag left in place for a period after the service is complete to stimulate post-service uterine contractions in the sow.
- Feed should be restricted for three days after service to create a favourable hormonal environment for embryo survival in the served sow. After this period sows should be fed to condition.

SERVICE TIMING

<table>
<thead>
<tr>
<th>Heat First Detected</th>
<th>Timing of First Service</th>
<th>Timing of Second Service</th>
</tr>
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<tbody>
<tr>
<td>Sunday</td>
<td>Monday (PM)</td>
<td>Tuesday (PM)</td>
</tr>
<tr>
<td>Monday (AM)</td>
<td>Monday (PM)</td>
<td>Tuesday (PM)</td>
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<td>Tuesday (AM)</td>
<td>Wednesday (AM)</td>
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<td>Tuesday (AM)</td>
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<tr>
<td>Tuesday (PM)</td>
<td>Tuesday (PM)</td>
<td>Wednesday (PM)</td>
</tr>
<tr>
<td>Days Following</td>
<td>Immediately</td>
<td>24 hours later</td>
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</table>

This serving schedule is designed for a unit that weans its sows on a Thursday morning. A single dose of semen will give effective cover within a sow’s reproductive tract for 24 hours.
**STEP 1**

Taking the bag with one wing held firmly by each hand, gently pull the two wings outwardly apart. Continue this until the catheter entry hole is clearly open. At this point you should feel a resistance to any further separation of the two wings.

**STEP 2**

Next, take the catheter by the shaft and gently but firmly in a pushing and twisting motion slide the catheter shaft into the bag through the entry hole. The catheter should make a tight leak proof seal with the bag wall.

**STEP 3**

The tip of the catheter should be lubricated and gently entered into the pre-cleaned vulva.

From here the catheter is inserted into the vagina at an upward angle to avoid the urinary tract.

Gentle pressure in combination with a twisting action should be used to insert the catheter, until it is firmly locked in the cervix.

**STEP 4**

Once a lock is achieved the bag should be inverted and raised in one hand, while the other hand is used to apply pressure on the sow's back to aid stimulation.

It is not necessary to force the semen from the bag as the sow will draw the semen from the bag by means of her natural uterine contractions. A service will usually take 2-3 minutes in total.

**STEP 5**

Following insemination, do not remove the catheter immediately from the sow. Instead kink the end of the catheter shaft that is protruding from the vulva, and hold this chink by inserting it into the strengthened plastic ring at the top of the empty semen bag. This may be left in place for 5-10 minutes after service to aid sow stimulation and minimize semen backflow.
COMMON BREEDS OF SWINE IN ONTARIO

YORKSHIRE: Colour- white 44%
   Ears- erect used
   Origin- England
Production Features-
   A maternal (mother) breed.
   Sows have large litters.
   Are good mothers with lots of milk.
   Market pigs are lean and grow quickly

LANDRACE: Colour- white 33%
   Ears- flopped used
   Origin- Denmark
Production Features:
   A maternal breed similar to the Yorkshire

HAMPshire: Colour- black with a white belt 7%
   Ears- erect used
   Origin- United States
Production Features-
   A sire breed.
   Heavily muscled with low backfat

DUROC: Colour- sandy red 14%
   Ears- flopped used
   Origin- United States
Production Features-
   A sire breed.
   Good growth and feed efficiency.
   Good carcass muscling.

The four breeds above are the most commonly used in Ontario. Some are used as pure bred others are crossed with a different breed. There are pros and cons for crossing breeds.

Each breed has important reasons for use within swine herds in Ontario. The white breeds produce large litters of piglets, are good mothers and milk well. Thus their litters grow well. These traits are referred to as reproductive traits. Unfortunately, reproductive traits are not passed on from one generation (sow and boar) to the next (piglets). These traits are said to have low heritability.

Crossbreeding however may improve this situation. Crossing of different breeds results in an increase in performance called heterosis or hybrid vigor. Traits such as growth rate and feed efficiency are of medium heritability also improve when breeds are crossed.
Therefore using crossbred sows, hybrid vigour in both the sow and litter will result in:

- Larger litters of heavier pigs farrowed by crossbred sows
- Greater survival in crossbred litters from birth to weaning.
- Superior pre-weaning and post-weaning growth rate in the crossbred litters.

By breeding one pure animal to another pure animal of a different type is called an F1 cross.

Semen prices per straw vary greatly depending on the type of semen you purchase, the volume of semen you purchase, availability of certain breed semen, frozen or fresh, proximity to the breeding facility for delivery and also if you prefer a technician to inseminate or if the farmer does this himself.

**ACTIVITY:**

Loving Larry the boar has an EBV of −2.3mm for back fat and an EBV of −4.2 days for days to 100kg.

Loving Larry sounds like a great boar! These results mean that he is genetically 2.3mm leaner and 4.2 days faster growing than the average boar in Ontario.

Now what would it mean if his EBVs had been +2.3mm and +4.2 days??

Answer: ______________________________________________________

CONCLUSION: _________________________________________________

On the next page is a table that the farmer may receive from a breeding unit to help him decide what type of semen may be best for his herd. Look at the EBV’s presented on the sheet.
SELECT BOARS RECOMMENDED FOR IMPROVED SOW PRODUCTIVITY - YORKSHIRE

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</tr>
</tbody>
</table>

Our best terminal York boars - 13.50 / service
Our elite terminal boars, ranking on or higher on the Sire Line Index - $20.00 / service, no discounts

Swine Project - Health - 4-H Ontario

Ordering Deadline
7:00 AM
1-800-493-BOAR
Ext 23

Purchasing and Shipping Information

Pictures of purebred boars are available on the OSI Website: [www.osi-inc.on.ca](http://www.osi-inc.on.ca)
Around the World, there are more than 29 different breeds of pigs that are raised for pork. The Yorkshire, Landrace, Duroc and Hampshire are popular breeds on Canadian farms.

<table>
<thead>
<tr>
<th>Breed Name</th>
<th>Breed Name</th>
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<tbody>
<tr>
<td>Chester White</td>
<td>Hereford</td>
<td>Oxford Sandy Black</td>
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<tr>
<td>Duroc</td>
<td>Italian Landrace</td>
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