W 1175

1-2 YEARS IN PROJECT

SWINE

Beginner Project Area Guide

Author:
Haley Webb, UT Extension Agent, Grainger County

Reviewed for Pedagogy:
Lynne Middleton, State 4-H Curriculum Specialist, Interim, University of Tennessee
Jennifer Richards, Extension Curriculum Specialist and Associate Professor, Department of Agricultural Leadership, Education and Communications, University of Tennessee

W 1175
1-2 YEARS IN PROJECT

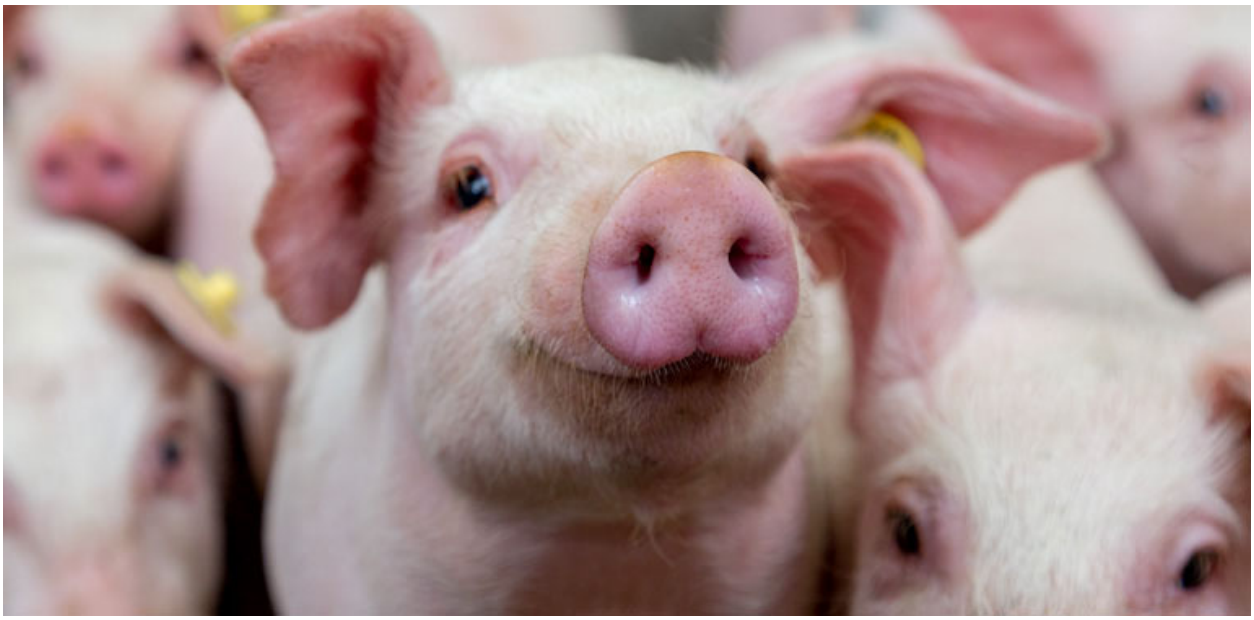
Swine General Industry and Terminology
Activity 1

Project Outcome:

- Understand terms that are frequently used when working with swine

---

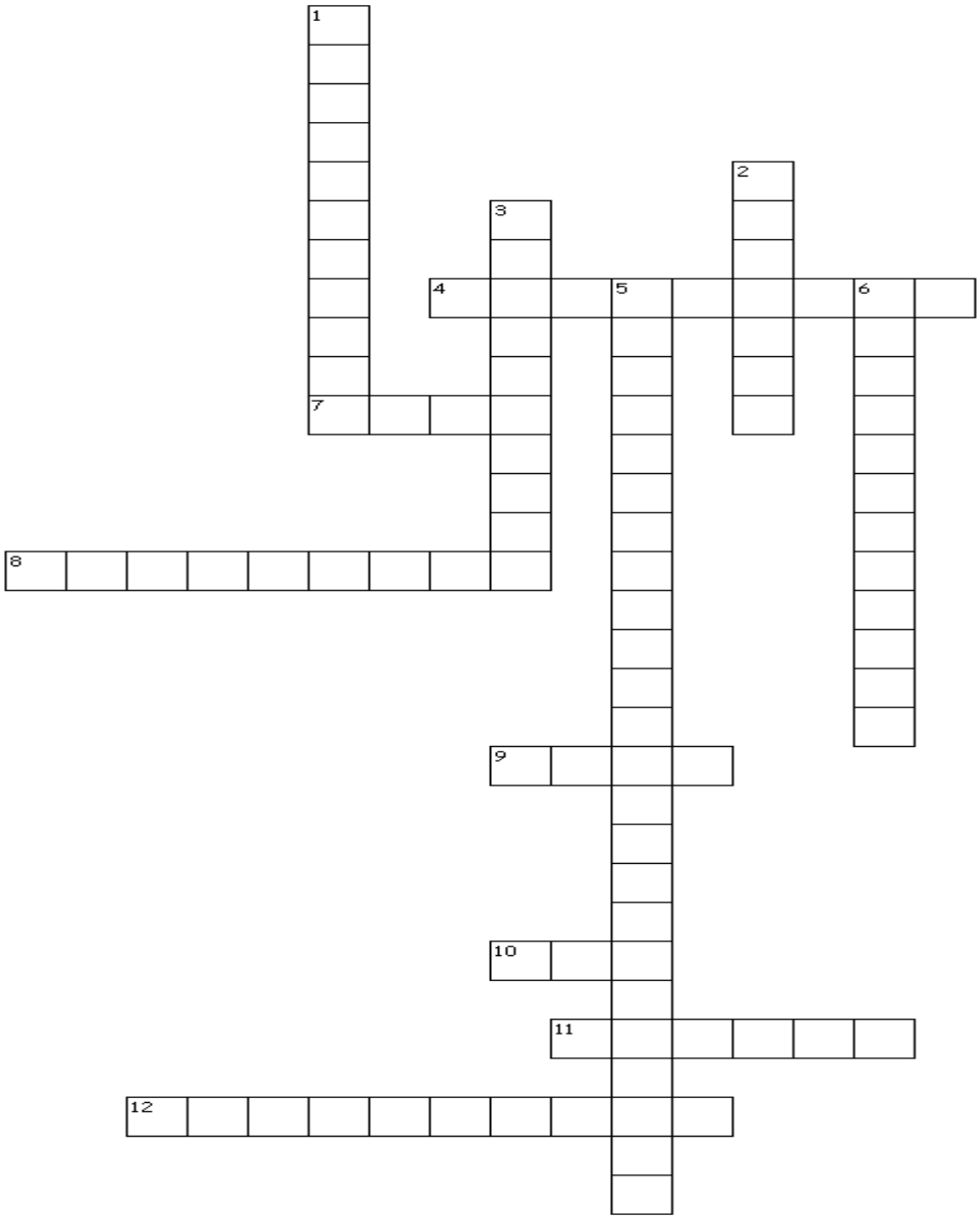
Whether you have raised pigs your whole life or never even touched a pig, there is some basic information you need to learn to have a successful 4-H swine project. Don't worry though – the activities in this project will guide you through learning what you need to know.



For the first activity, complete the crossword puzzle of basic swine terms on the next page by answering the questions on the page following the puzzle.

Word Bank for Crossword:

boar	barrow	sow	gilt
nursery pig	feeder pig	market hog	crossbred
purebred	farrowing	ear notching	segregated early weaning



ACROSS	**DOWN**
4. When the parents are different breeds of pig	1. What a piglet is called when they are from weaning weight to 25kg
7. The name of a female pig who has not given birth	2. When the parents are the same breed of pig
8. A pig giving birth	3. Swine when it's weight is ready for butcher
9. What is a male pigs called when used for breeding	5. A process of taking piglets at an early age from the farrowing crate
10. The name of a female pig who has given birth	6. A way to use identification in swine
11. What a castrated male pig is called	
12. What a pig of weaning age is called	

Answer Key:

ACROSS	**DOWN**
4. Crossbred	1. Nursery pig
7. Gilt	2. Purebred
8. Farrowing	3. Market hog
9. Boar	5. Segregated early weaning
10. Sow	6. Ear notching
11. Barrow	
12. Feeder pig	

Swine General Industry and Terminology
Activity 2

Project Outcome:

- Learn about the different types of swine production and how to differentiate them

---

Pork is a very popular form of meat that people consume. There are a few different types of swine production to keep a constant output. To learn about a few of them, fill out the chart below by using information found in this Penn State article: extension.psu.edu/swine-production

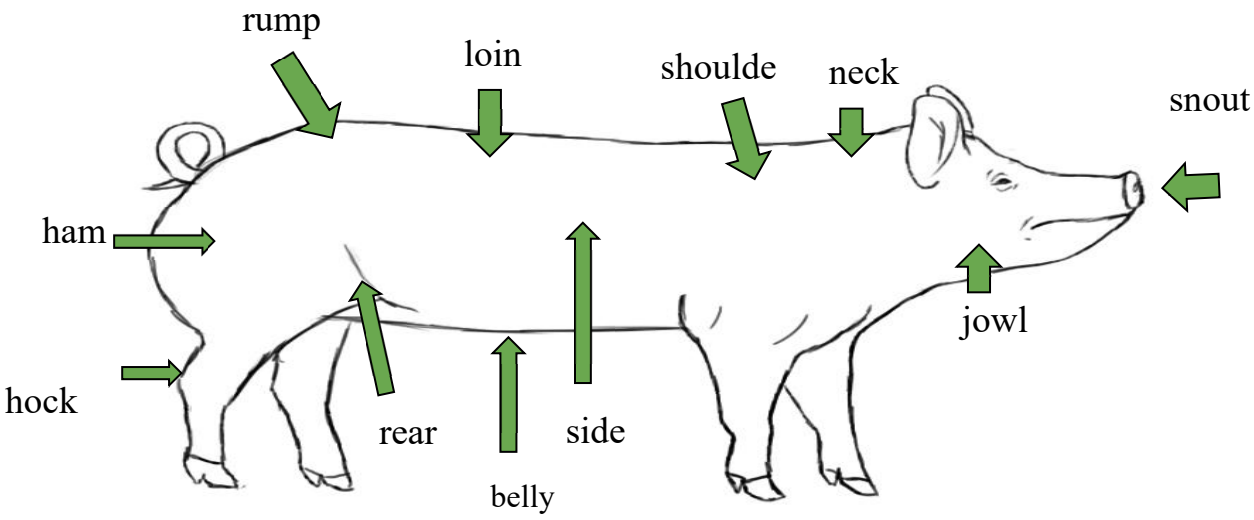
	Farrow to Finish	**Farrow to Feeder**	**Feeder to Finish**
Definition			
Swine weight range			
Personal positive reason to have this type of farm			

Swine General Industry and Terminology
Activity 3

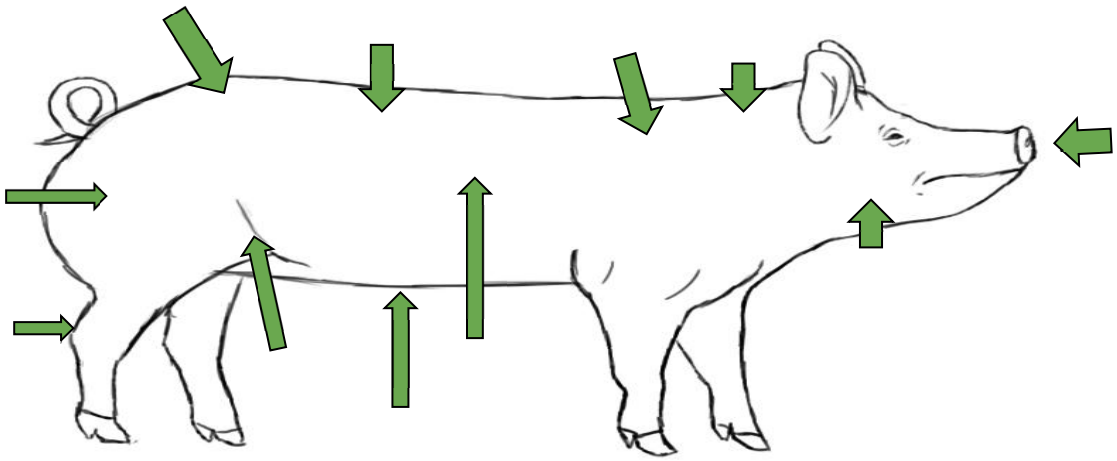
Project Outcomes:

- Be able to correctly label the parts of a hog

Below is a picture of a hog labeled with a few general parts and regions of the body that you will need to know. Study it, and next there will be the same hog, but it will be blank so that you can practice labeling on your own.



Use the photo below to test what you learned. Check your answers once you have finished!

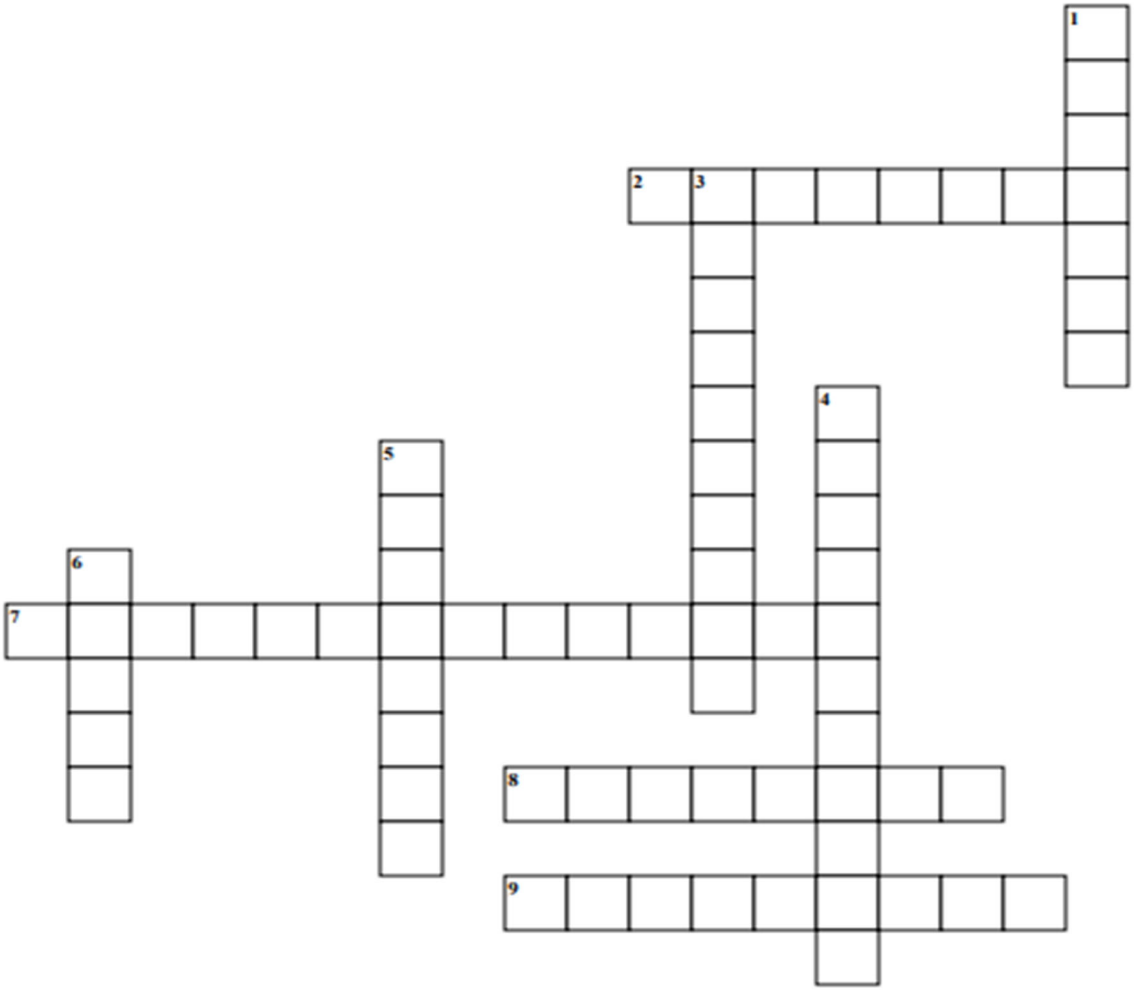


Don’t forget to go back and check your answers!

Swine Health and Welfare
Activity 4

Project Outcome:

- Define the following terms: vaccine, booster, antibiotic, bacteria, virus, colostrum, parasite, withdrawal time and biosecurity



Across

[2] contains antigens from viruses, bacteria, bacterial toxins, or parasites

[7] The time required after administration of a drug needed to assure that drug residues.

[8] Microscopic living organisms that are everywhere and can cause infection.

[9] The first secretion from the mammary glands after giving birth and is rich in antibodies.

Down

[1] A dose of an immunizing agent increasing or renewing the effect of an earlier one

[3] A medicine that inhibits the growth or destroyed microorganisms

[4] Procedures intended to protect humans or animals against disease or harmful biological agents.

[5] An organism that lives in or on another organism of another species and benefits by deriving nutrients at the other's expense.

[6] An infection or disease.

Answer Key:

Across

2. Vaccines
7. Withdrawal time
8. Bacteria
9. Colostrum

Down

1. Booster
3. Antibiotic
4. Biosecurity
5. Parasite
6. Virus

Swine Health and Welfare
Activity 5

Project Outcome:

- Distinguish among different types of injections: subcutaneous, intramuscular, intravenous

---

Read below the types of injections and their locations! We will use this in our next activity.

Intravenous (IV): Deposits the drug into the vein

- Commonly used for anesthetic agent administration
- Ear vein is the preferred site
- Sedation can be used to ensure good access
- Use with veterinary guidance and instruction

Subcutaneous (SQ): Deposits the drug under the skin

- Inject only into clean, dry areas
- Use the loose flaps of skin in the flank and elbow of small pigs
- Use the loose skin behind the ear on a sow
- Slide the needle under the skin away from the site of the skin puncture before depositing the compound

Intramuscular (IM): Deposits the drug into the muscle

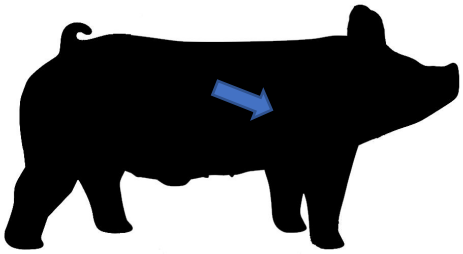
- Use a spot on the neck just behind and below the ear
- The neck areas should be used for IM injections
- Damage to the ham or loin can result in condemnation of the meat cut
- Use the proper needle size to ensure medication is deposited in the muscle

Swine Health and Welfare
Activity 6

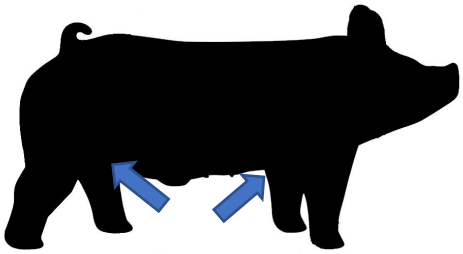
Project Outcome:

- Be able to locate proper injection site on the animal

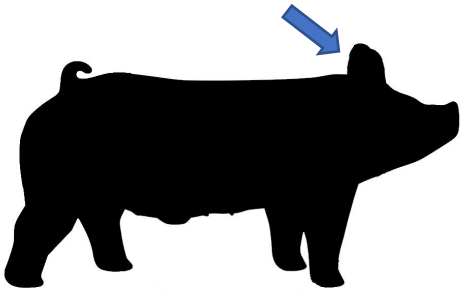
Label the photos below based on what injection type the photo shows.



_____



_____



_____

Answer Key: Intramuscular, Subcutaneous, Intravenous

Swine Health and Welfare
Activity 7

Project Outcome:

- Understand what gauge means as it relates to needle size and which gauges are appropriate for various age/size hogs

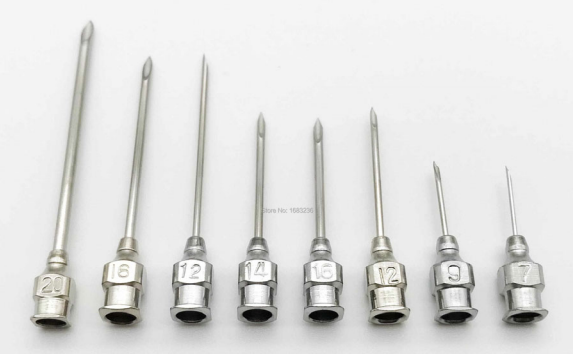
---

Below you will see two different charts showing the age groups of swine and their proper needle sizes.

Gauge in needles is the opening part on the end of a needle that varies in thickness. The smaller a gauge number is, the thicker it will be.

Intramuscular Injection	*Needle Gauge*	*Needle Length*
Baby pigs	18 or 20 Gauge	5/8" or ½"
Nursery	16 or 18 Gauge	¾" or 5/8"
Finisher	16 Gauge	1"
Breeding stock	14 or 16 Gauge	1" or 1 ½"

Subcutaneous Injection	*Length*
Nursery	½"
Finisher	¾"
Sows	1"



Helpful Definitions

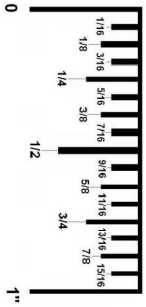
Baby pigs: Pigs who have not been weaned. Typically, pigs are weaned at 21 days of age.

Nursery: Pigs who have been weaned and not moved to the finishing phase. Typically, they stay here until 42-56 days of age.

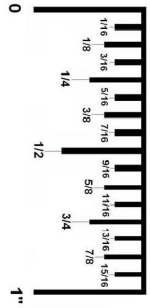
Finisher: These are pigs who are gaining weight to go to slaughter. These pigs will be in this phase until they are 280 pounds. This is usually 125-120 days of age.

Breeding stock: Pigs who are used to breed – sows and boars.

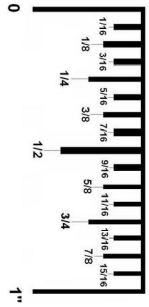
Use the rulers below to draw needles of different lengths.



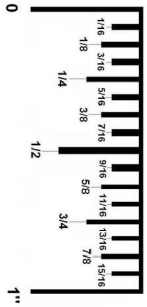
5/8”



1/2”



¾”



1”

Swine Health and Welfare
Activity 8

Project Outcome:

- Identify the signs of healthy and unhealthy swine

Now that you know about antibiotics, different injection methods, where to place a needle, and the size differences, let's move on.

Can you document three signs of a healthy pig and three signs of a sick/unhealthy pig?

Healthy Signs:	**Sick Signs:**

Here are a few in case you cannot think of any:

Healthy Signs: bright open eyes, alert, energized, no discharge, eating and drinking normally

Sick Signs: loss of appetite, mood change, coughing, nasal discharge, dark urine

Look at the photos below and determine which pigs are healthy and which pigs are unhealthy.

1.

4.

2.

5.

3.

6.

Answer Key:

Healthy pigs: 1, 3, 6

Pigs with signs of illness: 2, 4, 5

Swine Health and Welfare
Activity 9

Project Outcome:

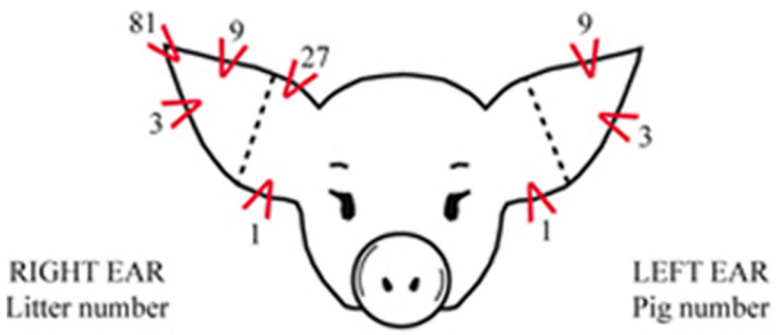
- Be able to differentiate among the different procedures that are performed on baby pigs

---

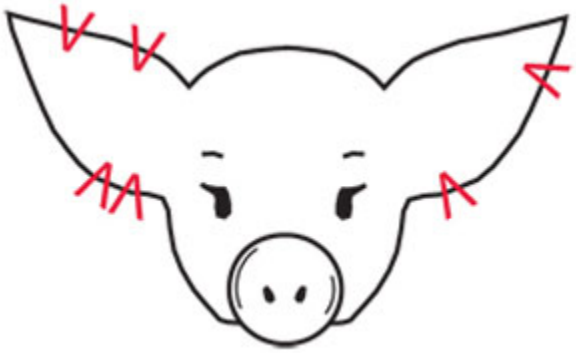
Standard procedures performed on baby pigs include iron injection, needle teeth clipping, tail docking, and ear notching. There is a reason for all of these, which you can learn about below.

Iron injection	Given between one and seven days of birth, this is to correct the development of iron deficiency that leads to anemia.
Needle teeth clipping	These tiny pointed teeth are snipped off to prevent damage when nursing on the sow, as well as if the piglets were to bite at each other.
Tail docking	This is when the piglet's tail is clipped short to prevent other pigs from biting it.
Ear notching	This is a form of identification; it tells the litter number (right ear) and the individual number from that pig litter (left ear).

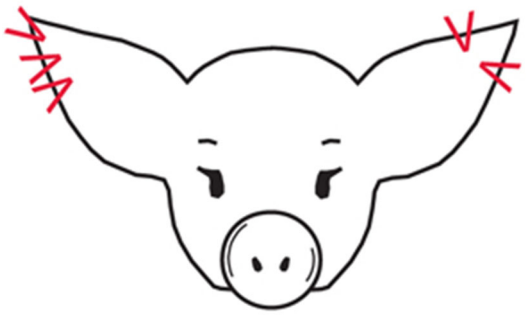
Let's learn how to read ear notches!



Now that you can read an ear notch let's practice!



Litter Number _____
Pig Number ____



Litter Number _____
Pig Number _____

Answer Key:

Pig One - Litter Number 38, Pig Number 4

Pig Two - Litter Number 87, Pig Number 12

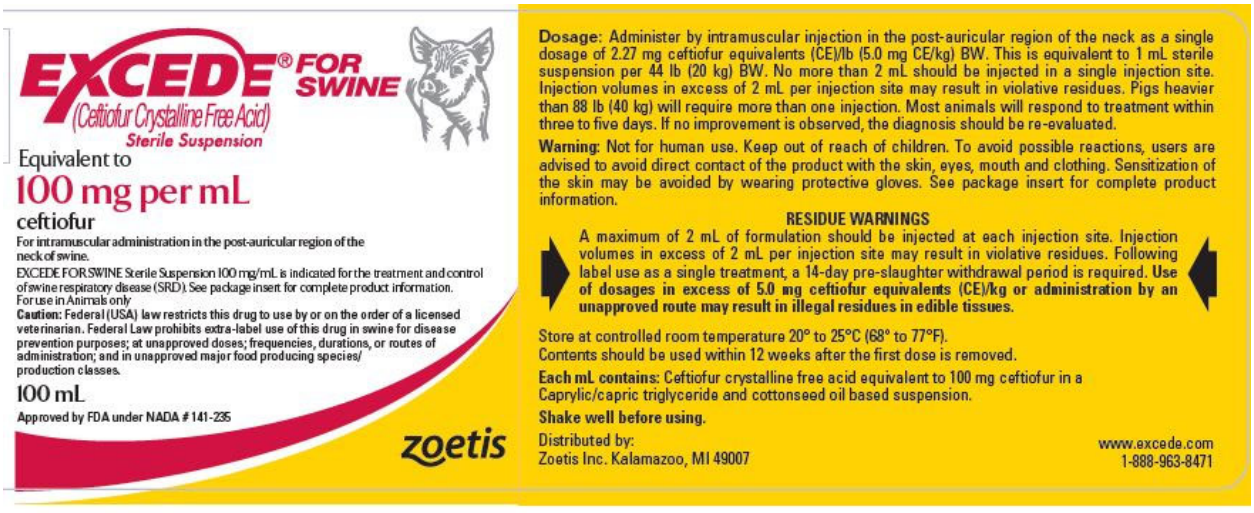
Swine Health and Welfare
Activity 10

Project Outcome:

- Identify the important parts of a medication label

Medication labels are extremely important to understand, from knowing that what is in the container properly fits what you need to give your hog, to knowing how much to give and for how long. As a group, you will be shown a medication label and should be able to answer the following questions.

1. What is the name of the medicine?
2. What is the active ingredient in this medicine?
3. How should you store this medicine?
4. How much of this medicine should a hog weighing 88 pounds receive?
5. How will this medicine be given to the hog?
6. What is the withdrawal time for this medicine?
7. Are there any side effects or warnings to be aware of?



Answer Key:

1. Excede for Swine
2. Ceftiofur
3. Room temperature (68-77 degrees Fahrenheit)
4. 2 milliliters (mL)
5. In the muscle
6. 14 days
7. None listed

Swine Nutrition and Feeding
Activity 11

Project Outcome:

- Define nutrition-related terms used in swine care

Getting the proper nutrition and food into your swine project's system is just as important as getting them into your own system. Use the table below to research the terms and match them to their definitions.

1. Monogastric	A. Having a stomach with only a single compartment
2. Omnivore	B. The feed mixed with another feed to improve the nutritive balance of the total and is intended to be further diluted and mixed to produce a supplement or a complete feed
3. Feedstuff	C. Made up of 20 simple building blocks called amino acids; helps to build muscle and other body proteins
4. Concentrate	D. The mixture of feed ingredients that helps to meet the nutritional needs of the animal
5. Protein	E. The body's fuel supply
6. Energy	F. An animal that has the ability to eat and survive on both plant and animal matter

Answer Key: 1. A, 2. F, 3. D, 4. B, 5. C, 6. E

Swine Nutrition and Feeding
Activity 12

Project Outcome:

- Learn about the feedstuffs used for swine and how they differ

---

Use the photos below to learn about the different types of feeds. Here is a word bank to use:

Whole Shelled Corn	Cracked Corn	Ground Corn
Whole Soybeans	Soybean Meal	White Salt
Trace Mineralized Salt	Limestone	Dried Molasses

1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

9. 

1.	2.	3.
4.	5.	6.
7.	8.	9.

Answer Key:

1. Dried Molasses	2. White Salt	3. Limestone
4. Soybean Meal	5. Whole Soybeans	6. Ground Corn
7. Trace Mineralized Salt	8. Cracked Corn	9. Whole Shelled Corn

Swine Nutrition and Feeding
Activity 13

Project Outcome:

- Be able to correctly draw a nutrition label from a hog feed bag

---

Now that you know about nutrition and feeding, you can do this next activity.

Every feed back has a label, or feed tag.

Label the parts of the feed tag below: **name of feed, ingredients, instructions, distributor and guaranteed analysis.**

MG Pig Starter 20% - Gen 2.0

Purpose Statement

Guaranteed Analysis

Crude Protein	min	20.00%	Phosphorus	min	0.50%
Lysine	min	1.15%	Salt	min	0.20%
Crude Fat	min	2.50%	Salt	max	0.70%
Crude Fiber	max	4.00%	Selenium	min	0.45 ppm
Calcium	min	0.50%	Zinc	min	100 ppm
Calcium	max	1.00%	Phytase	min	200 FTU/lb*

(Pichia pastoris, Trichoderma reesei)

List of Ingredients

Grain Products, Plant Protein Products, Processed Grain By-Products, Dried Whey, Calcium Carbonate, Sodium Chloride, Sodium Selenite, Monocalcium Phosphate, Potassium Chloride Copper Sulfate, Diatomaceous Earth (flow agent), L-Lysine, Porcine Digest, Dried Fermentation Biomass, Cereal Food Fines, Hemicellulose Extract, Origanmum Oil, Soybean Oil, Hydrated sodium calcium aluminosilicate, Zinc Oxide, Reed-Sedge Peal, Phosphoric Acid, Amorphous Silica Lactic Acid, Fumaric Acid, Calcium Propionate, Citric Acid, Potassium Sorbate, DL-Methionine Dicalcium Phosphate, L-Threonine, Mineral Oil, Copper Lysine Complex, Magnesium-Mica, Copper Proteinate, Zinc Proteinate, Saccharin Sodium, Vitamin E Supplement, L-Tryptophan, Ferrous Sulfate, Yucca Schidigera Extract, Iron Propionate, Roughage Products, Dried Aspergillus oryzae Fermentation Product, Selenium Yeast, Dried Bacillus lichenlformis Fermentation Product, Driec Bacillus subtilis Fermentation Product, Sodium Silico Aluminate, Manganese Proteinate, Manganese Sulfate, Zinc Sulfate, Dried Schizosaccharomyces pombe Fermentation Product, Chromium Propionate, Calcium Pantothenate, Niacin Supplement, Copper Chloride, Menadione Nicotinamide Bisulfate, Riboflavin Supplement, Vitamin A Supplement, Vitamin B12 Supplement, Folic Acid, Pyridoxine Hydrochloride, Vitamin D3 Supplement, Thiamine Mononitrate, Dried Aspergillus niger Fermentation Product, Ethlyenediamine Dihydriodide, Biotin.

Feeding Directions

Feed as the complete ration to pigs weighing 11 to 44 pounds.

CAUTION: Follow label directions. The addition to feed of higher levels of this product containing selenium in not permitted.

WARNING: This product, which contains added copper, should not be fed to sheep or related species that have a low tolerance to copper.

Manufactured by: M-G, Inc.
PO Box 697 • Weimar TX 78962
1-800-460-8581

NET WEIGHT: 50 lb. (22.7 kg) OR BULK

Swine Reproduction
Activity 14

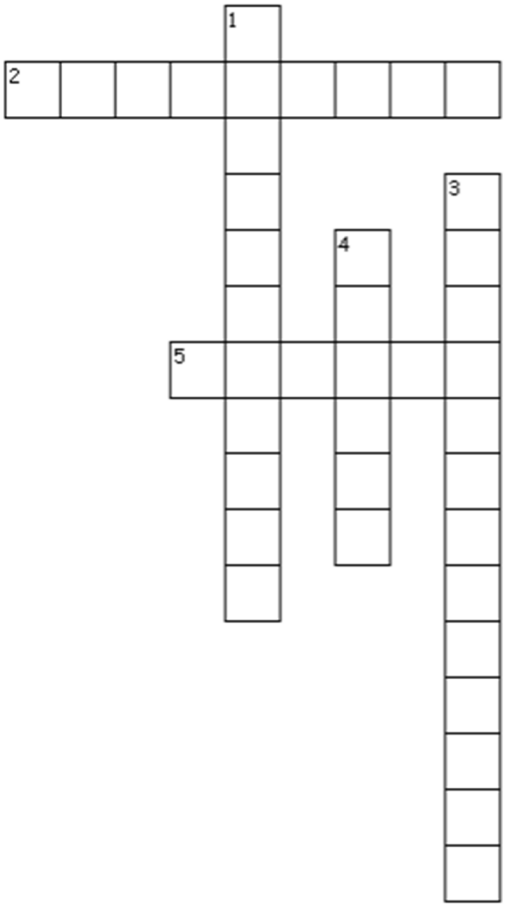
Project Outcome:

- Identify different terms used in swine reproduction

The crossword puzzle below contains vocabulary about reproduction. Once you are finished, check your answers on the next page.

Use this word bank:

Estrous	Litter	Gestation	Parturition	Estrous Cycle



Across	**Down**
2. The time period of being pregnant	1. The action of giving birth
5. Piglets born from the mother	3. Averaging 21 days
	4. A time when a female is in heat

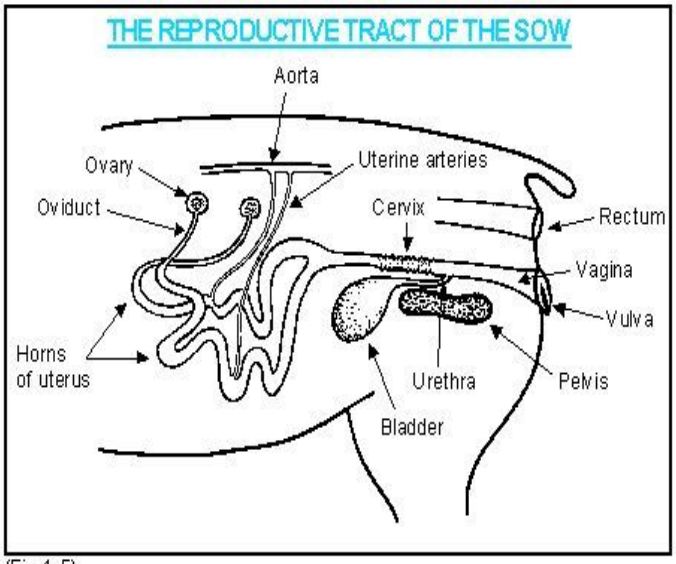
Answer Key:

Across	**Down**
2. Gestation	1. Parturition
5. Litter	3. Estrous Cycle
	4. Estrous

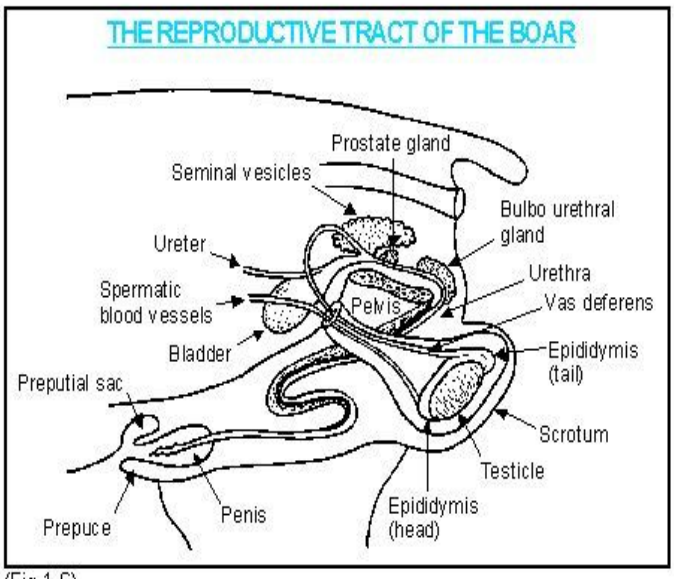
Swine Reproduction
Activity 15

Project Outcome:

- Distinguish between male and female reproductive tracts



(Fig.1-5)



(Fig.1-6)

Female

Vulva - External genital organ of the female pig
Vagina - A muscular canal that opens at the surface and extends inward toward the cervix
Ovary - Produces estrogen, progesterone and the egg
Uterus - Pair of tubes or horns that connect to the oviduct and the cervix

Male

Penis - External genital organ of the male pig; retracts into the sheath
Testicle (testes) - Produces hormones such as testosterone and sperm
Scrotum - Contains the testes; outside of the body to keep testes cool
Vas Deferens - Heavily muscled tube through which sperm move rapidly when being ejaculated

Both

Bladder - Contains and stores urine
Urethra - Discharges urine from the body

Use the terms listed here to fill in the blanks:

Vulva	Bladder	Uterus	Vas Deferens	Penis	Ovary
Urethra	Testicle (Testes)		Ovaries	Scrotum	Vagina

Both males and females have external (outside the body) genitalia. The female genitalia is called the _____ and the male genitalia is called the _____. Male pigs have _____ that produce sperm, and female pigs have _____ that produce the egg. Male pigs have a _____ that holds the testes outside the body. The _____, on the female, is a canal that opens inward from the vulva to the cervix. _____ is the pair of tubes that connect the cervix and the oviduct in the female. The _____ carries the sperm out of the body when it is being ejaculated. Both male and female pigs have a _____ that holds the urine and a _____ that discharges the urine from the body.

Answer Key:

Both males and females have external (outside of the body) genitalia. The female genitalia is called the **vulva** and the male genitalia is called the **penis**. Male pigs have **testes (Testicle)** that produce sperm, and female pigs have **ovaries** that produce the egg. Male pigs have a **scrotum** that hold the testes outside the body. The **vagina**, on the female, is a canal that opens inward from the vulva to the cervix. **Uterus** is the pair of tubes that connect the cervix and the oviduct in the female. The **vas deferens** carries the sperm out of the body when it is being ejaculated. Both male and female pigs have a **bladder** that holds the urine and a **urethra** that discharges the urine from the body.

Swine Genetics and Selection
Activity 16

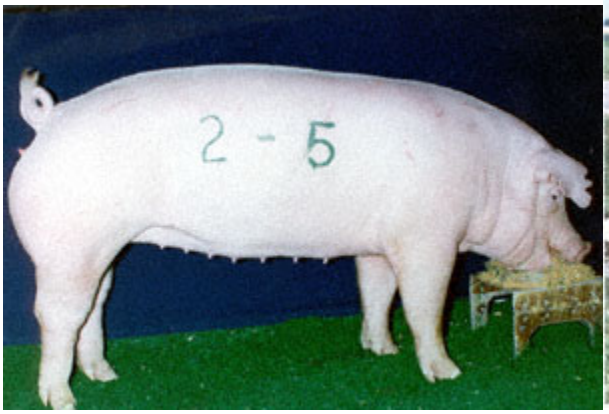
Project Outcome:

- Identify and be able to explain the purpose of the following breeds: Yorkshire, Landrace, Chester White, Duroc, Hampshire, Berkshire

---

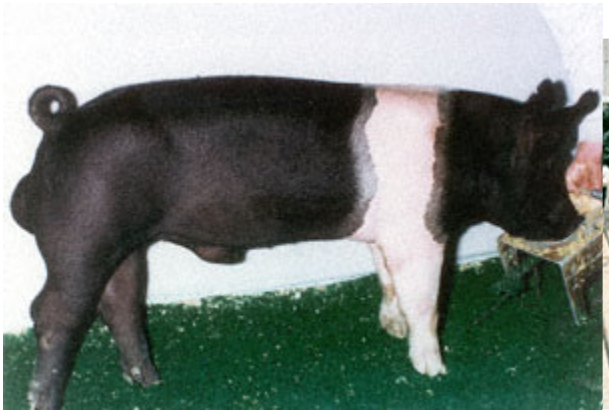
Yorkshire

Landrace



Chester White

Duroc



Hampshire

Berkshire

Use the chart below to identify the differences in these breeds of swine and then research their purposes. Here are some websites to help in your research:

breeds.okstate.edu/swine
porkcheckoff.org/pork-branding/facts-statistics/major-swine-breeds
www.showpig.com/EDUCATION/Breeds%20of%20Swine.pdf

	Characteristics	**Purpose**
Yorkshire		
Landrace		
Chester White		
Duroc		
Hampshire		
Berkshire		

Answer Key:

Breed	Characteristics	Purpose
Yorkshire	White with erect ears	Known for muscle with a high proportion of lean meat and low backfat
Landrace	White with droopy ears	Length of body, a high percentage of carcass weight in the ham and loin, and the ideal amount of finish
Chester White	White with droopy medium-sized ears	Known for their mothering ability, durability and soundness
Duroc	Red Pigs with drooping ears	Valued for their product quality, carcass yield, fast-growth and lean-gain efficiency
Hampshire	Black and white hogs with a white belt	Lean muscle, high carcass quality, minimal backfat and large loin eye
Berkshire	Black with white points	Fast and efficient growth, reproductive efficiency, cleanness and meat flavor and value

Swine Genetics and Selection

Activity 17

Project Outcome:

- Define the following terms: Sire, Dam, Genetic Selection, Pedigree, Expected progeny differences (EPD), Selection indexes

---

We use terms that help us when we are talking about genetics and breeding. Use the lists below to match the terms to their definition. Draw a line from each term to its definition.

Term

1. Sire
2. Dam
3. Genetic selection
4. Pedigree
5. Expected progeny differences (EPD)
6. Selection indexes

Definition

a. The difference between the average performance of the individual and the average performance of all progeny in the population
b. The female or mother of an animal
c. A diagram that depicts the biological relationships between an organism and its ancestor; includes the dam and sire
d. The male or father of an animal
e. Using traits such as litter size, litter weights, growth rate, feed efficiency, backfat thickness, pork quality and structural correctness to select an animal
f. Simplify selection by weighting EPDs by appropriate economic values to estimate the net merit of a selection candidate under a predefined breeding objective or goal.

Answer Key:

1. D 2. B 3. E 4. C 5. A 6. F

Swine Genetics and Selection
Activity 18

Project Outcome:

- Understand and be able to use EPD terms

Term	Definition
Expected progeny difference (EPD)	The difference between the average performance of the individual and the average performance of all progeny in the population
Number born alive (NBA)	Predicts the number born alive for daughters' litters relative to their farrowing group average. An individual with an EPD of +0.5 would be expected to produce daughters that would farrow litters with 0.5 more pigs than a sow with EPD 0.0.
Number weaned (NW)	The number of pigs that a dam raised to 21 days of age, adjusted for parity and number after transfer. You most likely will not see this on an EPD, but it is often used to calculate other things.
Litter weight (LWT)	Predicts the 21-day weight for a sow's daughters' litters. An individual with an EPD of +3.5 would be expected to produce daughters that would wean litters 3.5 pounds heavier at 21 days than a sow with an EPD of 0.0.
Days to 250 (DAYS)	Predicts the growth performance of offspring in days to 250 pounds live weight. An individual with an EPD of -3.0 would be expected to produce progeny that reaches 250 pounds five days faster than progeny of a parent with an EPD of +2.0.

Now that you know what each definition is, let's put it to use! Use the chart below to see if you can pick the best pig. When we read EPDs we want the highest number possible in NBA, NW and LWT. We want the days number to be lower. This means that it has taken them fewer days than normal to reach 250 pounds.

Pig Number	NBA	NW	LWT	DAYS
1	12	12	1.81	-11.29
2	11	10	1.68	-9.2
3	10	9	1.70	-1.3
4	9	7	.93	+2.1

Answer Key:

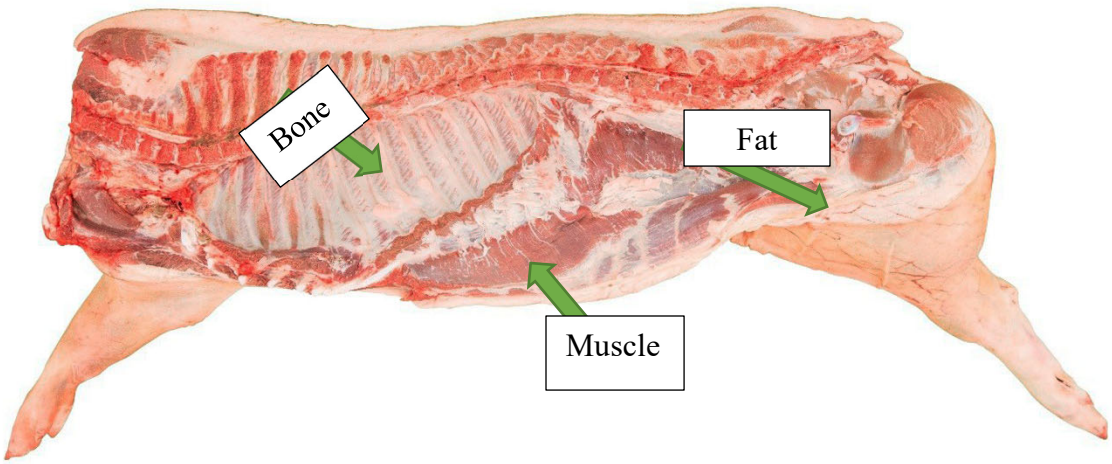
In order 1, 2, 3, 4

Swine Carcass and Pork Production
Activity 19

Project Outcome:

- Differentiate between muscle, bone, and fat on a pork carcass.

Use the photo below to learn what muscle, bone and fat look like on a pork carcass



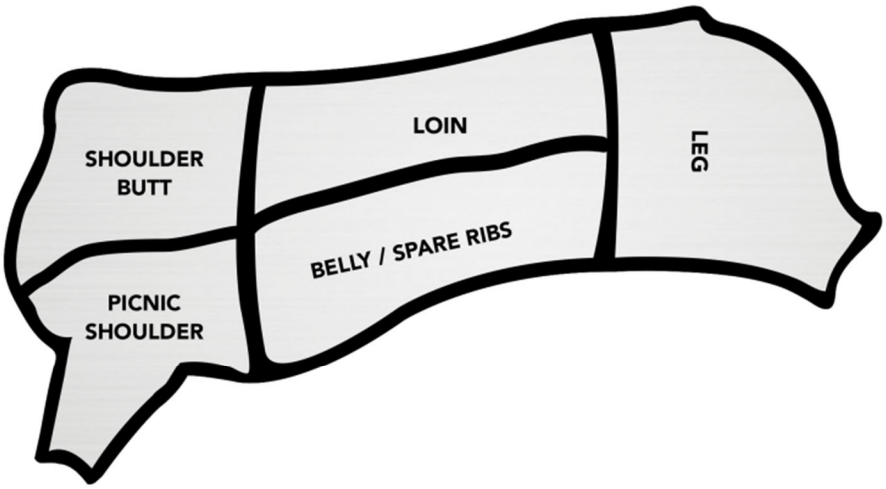
Now that you can see the differences, use the photo below to find different places on the carcass that have bone, muscle and fat. Draw and label arrows on these places.

Swine Carcass and Pork Production
Activity 20

Project Outcomes:

- Identify and distinguish among the wholesale cuts of a pork carcass

---



The picture above shows the wholesale cuts of pork that you need to remember. You can research the cuts below and fill in what product(s) are able to come from each area. Some might be very familiar, depending on what your parents keep at home in the fridge or freezer! Highlight the food products that you like to eat!

ham/leg:

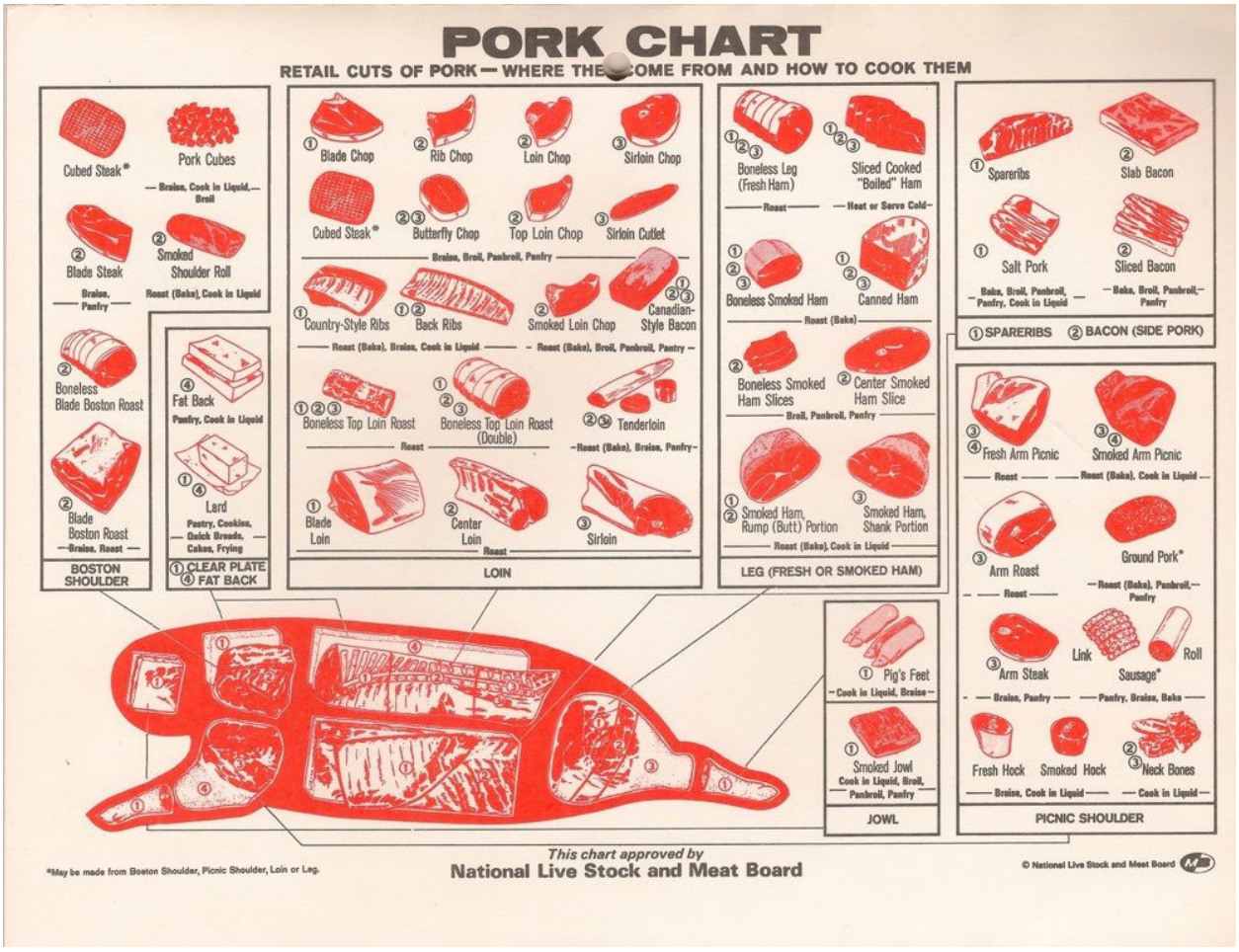
loin:

shoulder:

side/belly:

spareribs:

If you are not familiar with cuts of pork, use the chart below to help you identify some cuts that come from various wholesale cuts!



Swine Equipment and Record Keeping
Activity 21

Project Outcome:

- Identify the following equipment used in swine production: Snare, Scalpel, Ear notcher, Multi-use syringe, Disposable syringe, Hog board, Paint stick, Needle teeth clippers, Ear tag pliers, RFID tag

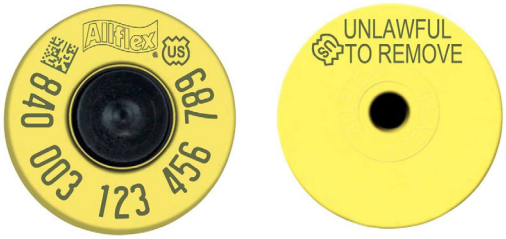
---

You will use a lot of different equipment when working with your hog project. Use the list of common equipment below to match with the photos.

Word Bank:
Snare
Scalpel
Ear notcher
Multiuse syringe
Disposable syringe
Hog board
Paint stick
Needle teeth clippers
Ear tag pliers
RFID tag


10
20
30
40
50
60cc
5
10
15
20
25
30cc
5
10
15
20ml
10cc
5cc
3cc


AllFlex
840 003 123 456 789
UNLAWFUL
TO REMOVE


MADE IN U.S.A.
ALL-WEATHER
PAINTSTIK
HECHO EN EE. UU.

Answer Key (in order from left to right and then down):

Scalpel	Ear notcher
Multiuse syringe	Ear tag pliers
Disposable syringe	RFID tag
Hog board	Needle teeth clippers
Paint stick	Snare

Swine Equipment and Recordkeeping
Activity 22

Project Outcome:

- Understand the importance of proper recordkeeping and how it relates to all areas of production

---

The reason records are important is to keep up with profit (how much money is made) or loss (how much money is lost). Keeping a record of how much feed is being used or a record of what inventory has been purchased can help you keep up with how much you are spending and what your return is on the amount of money.

List the date, the number of pigs you are feeding, the type of feed used, and the quantity of feed used. Document your records each time you feed your pigs. If the number of pigs you are feeding changes, document why it changed.

Date	Number of Pigs	Type of Feed Used	Quantity of Feed Used	Comments

Date	Number of Pigs	Type of Feed Used	Quantity of Feed Used	Comments
----	----	-----	TOTAL FEED	

Date	Number of Pigs	Type of Feed Used	Quantity of Feed Used	Comments
			TOTAL FEED	
----	----	-----		

Financial Records

List any expenses or income you incur during the project. List any and all purchases you make including supplies, equipment you may use, and even feed. At the end of the project, you can determine if you made or lost money.

Date of Transaction	Description of Transaction	Expense	Income	Total
EX: 3/2/23	Purchased two pigs	$250	--	$ - 250
EX: 3/2/23	Purchased 5 bags of feed	$15 per bag x 5 bags = $75	--	$ - 325

Congratulations!

You have completed the Beginner Swine Project Area Guide!

By completing this project book, you have learned about the basics of raising pigs and producing pork for Tennessee. Continue to seek opportunities to apply what you have learned to your project work so far and learn new things along the way. Make sure to upload any records to your digital 4-H portfolio.

Other opportunities of knowledge growth include:
Livestock Judging
Swine Skillathon Opportunities
UT Youth Livestock Judging Camp

INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF TENNESSEE

AG.TENNESSEE.EDU
Real. Life. Solutions.™