

Lesson B2–3

Exploring the Swine Industry

Unit B. Animal Science and the Industry

Problem Area 2. Identifying and Understanding the Segments of the Animal Science Industry

Lesson 3. Exploring the Swine Industry

New Mexico Content Standard:

Pathway Strand: Animal Systems

Standard: I: Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.

Benchmark: I-A. Use classification systems to explain basic functions of animal anatomy and physiology.

Performance Standard: 1. Describe functional difference in animal structures and body systems. 2. Classify animals according to anatomy and physiology.

Student Learning Objectives. Instruction in this lesson should result in students achieving the following objectives:

1. Locate major physical characteristics of swine.
2. Describe common swine breeds.
3. Explain selection of superior animals.
4. Contrast various pork production systems and methods of marketing hogs.

List of Resources. The following resources may be useful in teaching this lesson:

Recommended Resources. One of the following resources should be selected to accompany the lesson:

Ensminger, M. E., *The Stockman's Handbook*. Danville, Illinois: Interstate Publishers, Inc. 1992

Lee, Jasper S. *Introduction to Livestock and Companion Animals 2nd Edition*. Danville, Illinois: Interstate Publishers, Inc. 2000 (Textbook and Activity Manual Chapter 8)

Other Resources. The following resources will be useful to students and teachers:

Gillespie, James R. *Modern Livestock & Poultry Production Sixth Edition*. Albany, New York: Delmar. 2002 (Textbook Section 5)

List of Equipment, Tools, Supplies, and Facilities

Writing surface
Overhead projector
Transparencies from attached masters
Copies of student lab sheet

Terms. The following terms are presented in this lesson (shown in bold italics):

Barrow
Boar
Farrowing
Feeder pig
Gilt
Meatiness
Meat-type hog
Pedigree
Piglet
Porcine Stress Syndrome (PSS)
Production testing
Prolificacy
Sow
Specific pathogen free
Type

Interest Approach. Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

Have a local hog producer bring in a small pig and have students ask specific questions about the pig, for example what they eat, what they are used for, and how to raise them. Call your local large animal vet, if you do not know some area producers. If you are unable to locate a real pig, you may use pictures of pigs and pig facilities to stimulate questions from students.

Summary of Content and Teaching Strategies

Objective 1: Locate major physical characteristics of swine.

Anticipated Problem: What are the major parts of a hog?

- I. To judge or describe a hog you must know the proper terms used for correct identification of the hog and the carcass.
 - A. There are terms used to classify swine by both sex and age. A **piglet** is a baby pig. A **barrow** is a male pig that was castrated at a young age. A **gilt** is a young female that has not given birth or farrowed. The term **sow** is used to describe an older female pig. The term **boar** is used to describe a mature male hog.
 - B. Hogs have been genetically modified by breeding practices to have a strong bone structure to be able to carry their weight. Consumer demands have also encouraged pork producers to raise a more meat-type hog that is lower in fat and higher in lean meat.
 - C. Knowing major meat cuts is very important because the main use of hogs is for meat. There are four primary carcass cuts that represent the most valuable meat. They are the picnic shoulder, ham, loin, and Boston shoulder. Other cuts of meat that are of lower value are usually ground into sausage.

Use TM: B2–3A to explain external characteristics and major meat cuts of swine.

Objective 2: Describe common swine breeds.

Anticipated Problem: What are the common swine breeds and characteristics of the breeds?

- II. There are many different breeds of swine. When choosing a breed, you must determine what characteristics are best for your facilities and type of operation. The most common goal is to raise the most efficient-growing hogs with the highest possible percentage of muscle. Deciding to use purebred or crossbred animals is another consideration. The following are some of the more typical breeds you would find in the U.S.
 - A. The Duroc breed originated in the eastern U.S. from red hogs raised before 1865. Originally, they were known as Duroc-Jersey hogs, but the Jersey was removed and they are

simply known as Duroc. All Duroc hogs are red and can vary from very light to dark. They have ears that droop forward over the eyes. It is a popular breed because of good mothering ability, efficient feed conversion, fast growth rate, and prolificacy. **Prolificacy** describes the ability to produce large numbers of offspring. The Duroc is known as a meat-type hog. A **meat-type hog** is a hog that produces the greatest amount of high value meat cuts.

- B. The Hampshire breed originated in England and were brought to the U.S. between 1825 and 1835; they were originally called the Thin Rind. They are black hogs with a white belt that encircles the forepart of the body, starting behind the head and neck. The Hampshire has ears that stand erect. Some of the characteristics the breed is known for include foraging ability, leanness of carcass, and muscling. They are commonly used as show animals and are used in various crossbreeding programs.
- C. The Yorkshire breed originated in Yorkshire, England where it was called Large White. Later, the hogs became known as Yorkshires. As their original name depicts, they are large white hogs with long bodies; black spots sometimes appear on their skin. These spots are an undesirable trait called freckles. Yorkshires have erect ears and are known for having large litters, good mothering ability, good feed efficiency, and rapid growth. The breed is used as a bacon-type hog and in crossbreeding programs.
- D. Compared to others, the Hereford is a newer breed. It is red with a white face, similar to Hereford cattle. The breeds that were used to develop the Hereford include Poland China, Duroc, and others. Their ears droop forward and the breed is known for being prolific, having good mothering ability, and possessing desirable foraging ability.
- E. Berkshire hogs originated in Berkshire and Wiltshire counties in England. They are black with six white points and erect ears. This medium-sized hog is known for its lean carcass.
- F. Poland China hogs originated in Ohio where the breed was developed between 1800 and 1850 using several different bloodlines. Originally called the Warren County hog, Poland China hogs are black with six white points: four feet, the face, and the tip of the tail. This large breed of hogs has forward drooping ears and produces carcasses with large loin eyes and very little back fat. Because of their desirable traits, they are commonly used in crossbreeding programs.

Use TM: B2–3B to list the common swine breeds.

Objective 3: Explain selection of superior animals.

Anticipated Problem: How do I know which hogs are better than others?

- III. Since there are so many breeds and uses for hogs, selection will vary on your personal production needs. Consider what is best for you before you make any selections—buying the wrong animals could lead to the failure of your entire business. Size, health, type, pedigree, and production testing are some of the many things that you may look for.

- A. Your type of production will determine the size of animals to purchase. You may need piglets, boars, gilts, or something in-between. Each animal will have different potential, and therefore, different characteristics to look for when making selections for production improvement.
- B. Health of animals, no matter what their size or gender, is very important to consider in herd improvement. Not only do you want to purchase animals that are disease free, you also want to protect your existing animals from diseases that may be brought in. You may want to consider purchasing animals from a SPF herd or a *specific pathogen free* herd. These swine are free from diseases like mange, leptospirosis, swine dysentery, and snout distortion at birth. Herds should be certified brucellosis and pseudorabies free. Never buy animals that do not have herd health information available from the breeder or seller. **Porcine Stress Syndrome (PSS)** is an inherited neuromuscular disease in heavily muscled animals. You can test for PSS before purchasing animals. Always observe animals brought into your herd for signs of parasites or diseases. If you suspect anything may be wrong, isolate the animal immediately to discourage the spread of anything to other animals.
- C. Selection for **type** simply means that you are trying to find an animal that is as close to ideal as possible. When selecting for type, you should consider meatiness, genetic defects, porcine stress syndrome, and pedigree. **Meatiness** describes how much meat and fat an animal has and is done by measuring back fat. A **pedigree** is a record of ancestry or heredity. You can avoid many inherited genetic defects by researching the animal's pedigree.
- D. **Production testing** is the best way to evaluate and make predictions on an animal's potential to be productive. Many swine registries for purebreds have a production registry, as well as a meat certification registry. You will look at many characteristics including offspring, health, appearance, back fat, ability to grow quickly, reproductive qualities and if standards of the breed are met.

Use TM: B2–3C to discuss various ways to select swine for herd improvement.

Objective 4: Contrast various pork production systems and methods of marketing hogs.

Anticipated Problem: What are the different production systems and how do they work?

- IV. Before considering what type of hog operation to start, you should first take inventory of what you have to work with. If you have existing buildings or feed storage facilities, you may want to use the hog system that would require the least amount of modifications to decrease startup costs. The four types of swine production systems are complete sow and litter systems or farrow to finish, purebred systems, feeder-pig production systems, and finishing feeder-pig systems.
 - A. Sow and litter systems require the most equipment because the pigs are farrowed and fed up to slaughter weight at the same farm. **Farrowing** is the process of a female pig giving birth. Two different approaches to this system are confinement or pasture systems. Con-

finement is becoming more popular because pigs can be marketed evenly throughout the year. The disadvantage is the startup costs are expensive, but the return will be greater with less labor and the ability to profit throughout the year. Pasture systems require a lower initial investment, but are more labor intense. Using pasture systems also limits production depending on the season. The sow and litter system is the most common swine operation.

- B. The goal of a purebred system is to produce breeding stock that other producers will want to use and therefore buy. This system requires intense management mainly because of registration paperwork and other records that should be kept. Purebred systems are the least common of the swine operations. Even though less than 1% of all hogs raised in the U.S. are registered purebreds, they are extremely important because they are constantly working to improve the breeds. In order to become a purebred system owner, you must know a great deal about genetics, showing and promotion of the breeds. Consumers are demanding lean pork and purebred system owners are working to use genetic programs to create animals that will meet consumer demands.
- C. Feeder-pig production systems include having the equipment to breed and farrow litters of piglets. A **feeder pig** is a pig that has been weaned and weighs approximately 40 pounds. This system simply farrows and weans and then sells the feeder pigs to feeders. It is necessary to keep a breeding herd of sows that should farrow 14 to 16 piglets each, to break even. Minimal investment is required, but management is intense because a steady supply of feeder pigs is necessary. Feed requirements are less for this type of system than others.
- D. Finishing feeder-pig systems are operations that buy feeder pigs at 40 pounds and feed them until they are at market weight or approximately 220 pounds. Profit acquired through this system requires getting the pigs to gain the most weight on the smallest feed investment. For this reason balancing rations is very important.

Use TM: B2–3D to discuss swine operation options.

Review/Summary. Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used to determine which objectives need to be reviewed or retaught with a different approach. Questions provided in the recommended textbooks may also be used to help review.

Application. Application can involve student activity with the provided labs.

Evaluation. Evaluation should focus on student achievement of the objectives for each lesson. Various techniques can be used, such as performance on the application activities. A sample written test is attached.

Answers to Sample Test:

Part One: Matching

1 = f, 2 = d, 3 = b, 4 = g, 5 = e, 6 = a, 7 = c

Part Two: Completion

1. barrow
2. boar
3. gilt
4. meatiness
5. meat-type hog
6. Farrowing
7. feeder pig

Part Three: Short Answer

Free from diseases like mange, leptospirosis, swine dysentery, and snout distortion at birth.

Test

Lesson B2–3: Exploring the Swine Industry

Part One: Matching

Instructions. Match the term with the correct response. Write the letter of the term by the definition.

- | | | |
|-----------------------|----------------------------|----------------|
| a. Pedigree | d. Type | g. Prolificacy |
| b. Sow | e. Piglet | |
| c. Production testing | f. Porcine Stress Syndrome | |

- _____ 1. An inherited neuromuscular disease in heavily muscled animals that you can test for before purchasing animals.
- _____ 2. Trying to find an animal that is as close to ideal as possible.
- _____ 3. An older female pig.
- _____ 4. The ability to produce large numbers of offspring.
- _____ 5. A baby pig.
- _____ 6. A record of ancestry or heredity.
- _____ 7. The best way to evaluate and predict an animal's production potential.

Part Two: Completion

Instructions. Provide the word or words to complete the following statements.

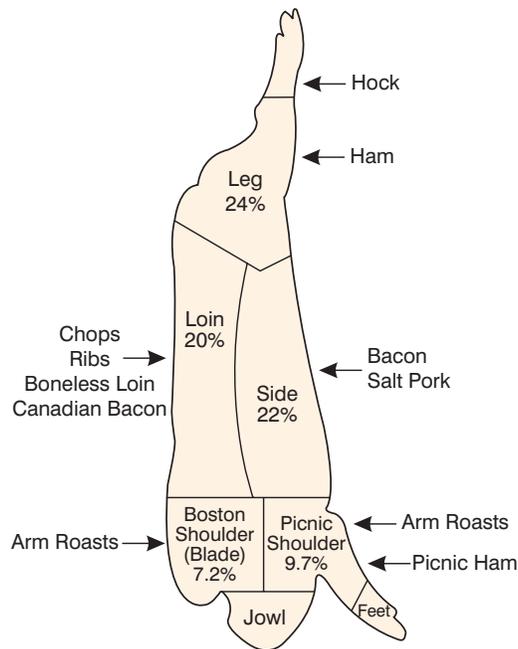
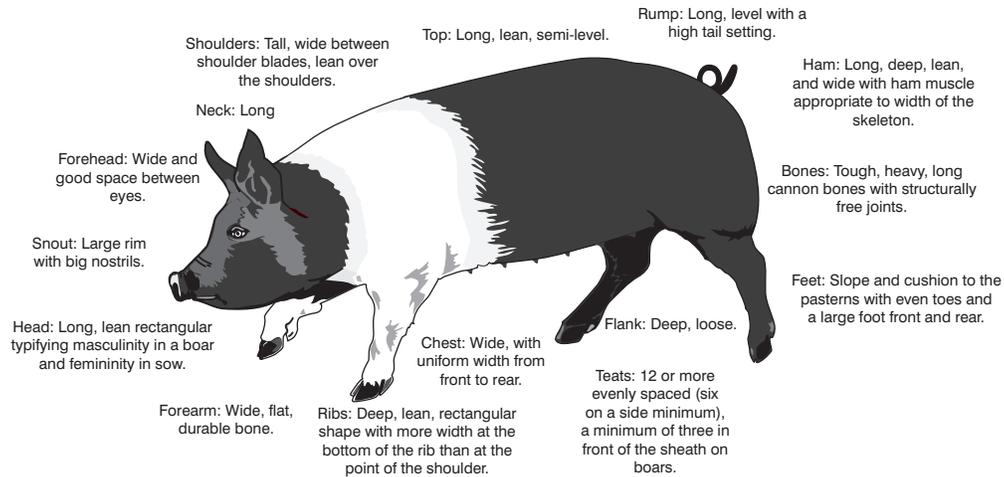
1. A _____ is a male pig that was castrated at a young age.
2. The term _____ is used to describe a mature male hog.
3. A _____ is a young female that has not given birth or farrowed.
4. _____ describes how much meat and fat an animal has. It is determined by measuring back fat.
5. A _____ produces the greatest amount of high value meat cuts.
6. _____ is the process of a female pig giving birth.
7. A _____ is a pig that has been weaned and weighs approximately 40 pounds.

Part Three: Short Answer

Instructions. Provide information to answer the following question.

Why would you want to buy hogs from a specific pathogen free herd?

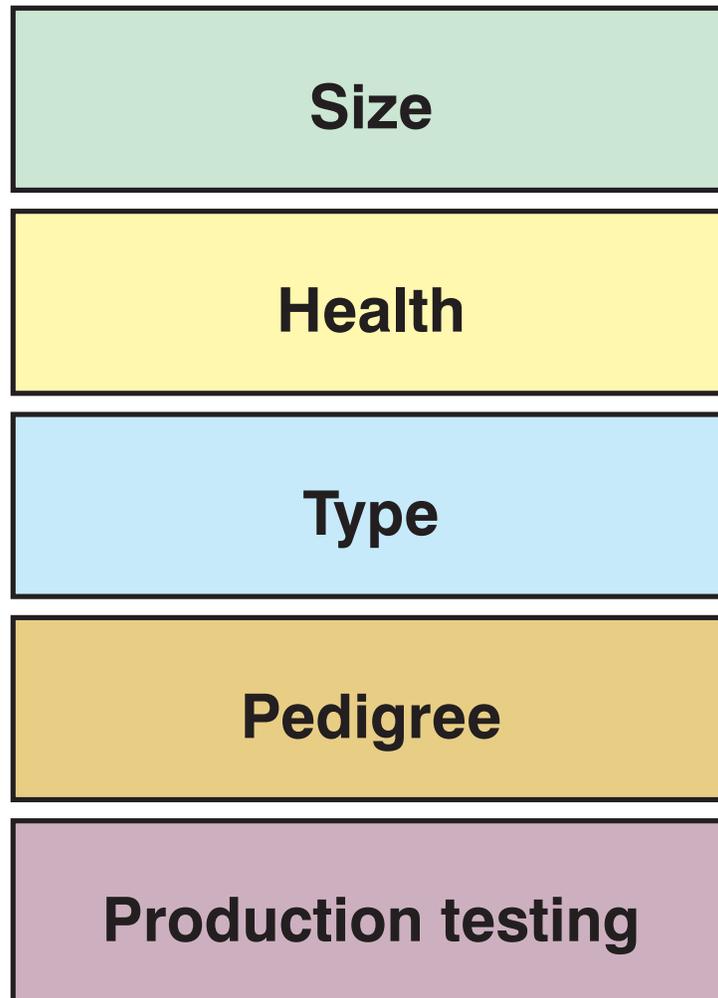
SWINE EXTERNAL PARTS AND MEAT CUTS



COMMON SWINE BREEDS

- **Duroc**
- **Hampshire**
- **Yorkshire**
- **Hereford**
- **Berkshire**
- **Poland China**

FACTORS TO CONSIDER FOR HERD IMPROVEMENT



FOUR TYPES OF SWINE PRODUCTION SYSTEMS

- **Complete sow and litter systems**
- **Purebred systems**
- **Feeder-pig production systems**
- **Finishing feeder-pig systems**

Lab Sheet

Purpose:

Determine what equipment is necessary to start a specific hog operation.

Materials:

Research materials
Writing utensil
Paper (2 pieces)

Procedure:

1. Pick one type of hog operation.
2. On one sheet of paper write the type of operation at the top and list as many items as you can that would be necessary to carry out your type of operation. List all equipment, supplies, housing facilities, feed, medicine, and any other items you would need.
3. On the second sheet of paper, draw a basic picture of what the setup would look like.
4. Attach the sheets and turn them in.

Extension:

Acquire supply catalogs and list the price of all items necessary for your operation.