

Course	Agricultural Science I
Unit	Introduction to Swine Production
Lesson	Introduction to the Swine Industry
Estimated Time	50 minutes

Student Outcome

Describe the importance of the swine industry in Missouri and the United States.

Learning Objectives

1. Describe the economic implications of the swine industry.
2. Define commonly used swine terms.
3. Explain how the swine industry evolved in the United States.
4. Explain how production systems differ.
5. Identify the business structures in the swine industry.
6. Identify career opportunities in the swine industry.

Grade Level Expectations

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. Activity Sheets
 -  AS 1 - A Career in the Swine Industry
2. *Introduction to Swine Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
3. *Introduction to Swine Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- Map of the United States

Supplemental Information

1. Internet Sites
 - Pig.com. Accessed July 3, 2007, from http://www.pig.com/designs/pig_facts.htm.
 - Swine Publications. MU Extension. University of Missouri-Columbia. Accessed July 3, 2007 from <http://extension.missouri.edu/explore/agguides/ansci/swine.htm>.
 - "Pigs, Pork, Swine." Accessed July 3, 2007, from <http://www.clover.okstate.edu/fourh/aitc/lessons/extras/facts/swine.html>.
 - "Missouri Swine Resource Guide." MU Extension. University of Missouri-Columbia. Accessed July 3, 2007, from <http://agebb.missouri.edu/swine/>.
 - Missouri Farm Facts-Swine. Accessed July 3, 2007 from <http://agebb.missouri.edu/mass/indepth/hogs/hgfacts.htm>.
 - "Today's U.S. Pork Industry." National Pork Producers Council. Accessed July 3, 2007, from http://www.nppc.org/about/pork_today.html.

Interest Approach

Place students in small groups. Provide a map of the United States to each group. Working as a group, have the students identify what they feel are the top five swine-producing states. Once all the groups are finished, have a representative from each group tell which states were chosen and why. List each state on the board and use this list to create a discussion as to why the states were chosen.

Communicate the Learning Objectives

1. Describe the economic implications of the swine industry.
2. Define commonly used swine terms.
3. Explain how the swine industry evolved in the United States.
4. Explain how production systems differ.
5. Identify the business structures in the swine industry.
6. Identify career opportunities in the swine industry.

Instructor Directions	Content Outline
Objective 1 <i>Emphasize the size of the swine industry across the United States and in Missouri. Record statistics concerning the swine industry on the board.</i>	Describe the economic implications of the swine industry. <ol style="list-style-type: none">1. In 2005, more than 105 million hogs were processed into over 21 billion pounds of pork.2. Around 67,000 swine producers operate nationwide.3. The swine industry generally ranks either fourth or fifth annually among all production agriculture industries in terms of farm cash receipts.4. More than \$11 billion worth of hogs are sold each year with a retail value of \$30 billion.5. In 2005, Missouri had approximately three percent of hog operations nationwide.6. The state ranked seventh in the number of hogs and pigs produced.7. Mercer, Sullivan, and Putnam counties, which have close to one million head of hogs, are the top three Missouri counties in swine production.
Objective 2 <i>Ask the class how many students have direct experience with swine. Discuss the terminology.</i>	Define commonly used swine terms <ol style="list-style-type: none">1. Farrow – to give birth2. Gilt – young female that has not yet farrowed3. Barrow – castrated male pig4. Boar – male pig used for breeding5. Sow – mature female hog6. Feeder pig – gilt or barrow between weaning and finishing

Instructor Directions	Content Outline
	<p>7. Market hog – gilt or barrow weighing from 240 to 270 pounds and ready for processing</p>
<p>Objective 3</p> <p><i>Ask the class if they think that more or fewer producers are involved in swine production today than 30 years ago. During the discussion, emphasize how the location of the industry and current focus of the swine industry are changing.</i></p>	<p>Explain how the swine industry evolved in the United States.</p> <ol style="list-style-type: none"> 1. Fewer producers – currently 67,000, compared to three million 40 years ago 2. Larger farms – ranging in size from 1,000 to 80,000 sows 3. Changing location – from the Corn Belt to North Carolina, Arkansas, Texas, Kansas, and Oklahoma 4. Focus on expanding exports
<p>Objective 4</p> <p><i>Divide the board into three categories. Label them “Farrow-to-Finish Production,” “Feeder Pig Production,” and “Feeder Pig Finishing.” Write the characteristics of each production system in the appropriate category.</i></p>	<p>Explain how production systems differ.</p> <p>Farrow-to-finish production</p> <ol style="list-style-type: none"> 1. Most common type of production system, involving the entire production process. 2. Gilts and sows are mated to boars or artificially inseminated. 3. Females farrow and are bred again when the piglets are weaned. 4. Pigs are moved to a nursery until they weigh approximately 50 pounds. 5. The pigs are then moved to finishing barns until they weigh 240 to 270 pounds. Upon reaching the weight goal, they are sold as market hogs. <p>Feeder pig production</p> <ol style="list-style-type: none"> 1. Involves producing pigs to sell to other producers to be fed for market. 2. Baby pigs are sold when they weigh approximately 50 pounds. <p>Feeder pig finishing</p> <ol style="list-style-type: none"> 1. Finishers purchase or receive pigs at approximately 50 pounds. 2. They feed the pigs until they reach a market weight of 240 to 270 pounds. 3. The pigs are then sold for processing.

<p>Objective 5</p> <p><i>Ask students what brand names or farm names they associate with the swine industry (e.g., Premium Standard Farms, Excel). Describe the influx of large corporations into the swine industry over the last several years. Focus on vertically integrated operations.</i></p>	<p>Identify the business structures in the swine industry.</p> <p>Privately owned family farms</p> <p>Network production</p> <ol style="list-style-type: none"> 1. A group of producers cooperate to decrease production costs and improve profits for each operation. 2. Can involve collective marketing arrangements, purchasing supplies at a discount for member operations, or cooperative production of swine. <p>Contract basis</p> <ol style="list-style-type: none"> 1. The individual producer signs a contract to produce pigs for a company. 2. The company owns the pigs and finances the operation. The producer provides the facilities, equipment, and labor. 3. The company makes many of the management decisions. 4. The producer is paid a fixed amount per animal. <p>Large-scale corporate farms</p> <ol style="list-style-type: none"> 1. Goal is efficient production of a uniform product. 2. May be a vertically integrated operation, meaning the company owns and controls all phases of the production process.
<p>Objective 6</p> <p><i>Describe the diversity of the swine industry. List some of the careers. Have students use AS 1 to research a career in the swine industry and report their findings to the class.</i></p> <p> AS 1 – A Career in the Swine Industry</p>	<p>Identify career opportunities in the swine industry.</p> <ol style="list-style-type: none"> 1. Producer 2. Breeding manager 3. Farrowing manager 4. Nursery manager 5. Feed mill technician 6. Artificial insemination technician 7. Animal geneticist 8. Animal health product sales representative 9. Veterinarian 10. Hog buyer 11. USDA inspector 12. Quality control supervisor

<p>Application:</p> <p>📄 AS 1 – A Career in the Swine Industry</p>	<p>Answers to AS 1 Answers will vary.</p> <p>Other activities</p> <ol style="list-style-type: none"> 1. Have students research information about swine numbers in your community using <i>Missouri Farm Facts</i>. 2. Have students compile a list of local businesses or careers directly related to swine production and the swine industry.
<p>Closure/Summary</p>	<p>Receipts from swine production total more than \$11 billion each year. The swine industry is evolving, with fewer producers and larger farms, changes in the location of swine production, a focus on increasing exports, and a growing interest in corporate hog production. Many career opportunities are available in this diverse industry.</p>
<p>Evaluation: Quiz</p>	<p>Answers to Evaluation</p> <ol style="list-style-type: none"> 1. c 2. d 3. d 4. a 5. Answers may include any three of the following: producer, breeding manager, farrowing manager, nursery manager, feed mill technician, artificial insemination technician, animal geneticist, animal health product sales representative, veterinarian, hog buyer, USDA inspector, or quality control supervisor. 6. A barrow is a castrated male, a boar is a male pig used for breeding, and a gilt is a young female who has not yet farrowed. 7. The individual producer signs a contract to produce pigs for a company. The company owns the pigs and finances the operation, and the producer provides the facilities, equipment, and labor. The company makes many of the management decisions. The producer is paid a fixed amount per animal. 8. Farrow-to-finish swine production is the most common type of production, covering the entire production process. Gilts and sows are mated to boars. Females farrow and are bred again when the piglets are weaned. The baby pigs are moved into a nursery until they weigh approximately 50 pounds.

	<p>They are then moved to finishing barns where they grow until they reach 240 to 270 pounds. Upon reaching the weight goal, they are sold as market hogs.</p>
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Lesson 1: Introduction to the Swine Industry

Name _____

A Career in the Swine Industry

Objective: Learn more about the swine industry by conducting an interview with someone in a related career.

Interview a person with a career in the swine industry. Record his or her name, occupation, and place of employment. Use the questions on this sheet as an aid when interviewing the individual. Write down the answers to questions, as well as any other information that is important. Then make a report about the career to the class.

Name:

Occupation:

Place of Employment:

How long have you worked in your present occupation?

Why did you choose this career?

What training was necessary for this career?

What skills do you use?

What previous jobs helped prepare you for this one?

What other jobs have you considered?

What are your career plans for the future?

What advice would you give someone who is considering a career in this area?

Comments:

UNIT - INTRODUCTION TO SWINE PRODUCTION Name _____

Lesson 1: Introduction to the Swine Industry Date _____

EVALUATION

Circle the letter that corresponds to the best answer.

1. How many hogs were processed in the United States in 2005?
 - a. 1.5 billion
 - b. 105,000
 - c. 105 million
 - d. 500,000

2. In what type of business structure does a group of producers cooperate to decrease production costs and improve profits for each operation?
 - a. Contract production
 - b. Corporate production
 - c. Vertically integrated production
 - d. Network production

3. How many swine producers operate in the United States today?
 - a. 367,000
 - b. 267,000
 - c. 167,000
 - d. 67,000

4. Where was most of the swine production in the United States located in the past?
 - a. Midwest
 - b. South
 - c. West
 - d. East

Course	Agricultural Science I
Unit	Introduction to Swine Production
Lesson	Breeds of Swine
Estimated Time	90 minutes or 2 50-minute blocks

Student Outcome

Identify the major swine breeds and their significance in the industry.

Learning Objectives

1. Describe the identifying characteristics and histories of the common swine breeds.
2. Determine factors that influence breed selection.
3. Explain how hybrid hogs are developed.
4. Explain the differences between inbreeding, outcrossing, and crossbreeding.

Grade Level Expectations

SC/LO/3/1/E/09-11/a

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. Activity Sheets
 -  AS 1 – Breeds of Hogs
 -  AS 2 – Researching Swine Breeds
2. *Introduction to Swine Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
3. *Introduction to Swine Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- Photographs of each swine breed to be discussed

Supplemental Information

1. Internet Sites
 - “Breeds of Livestock.” Oklahoma State University. Accessed July 5, 2007, from <http://www.ansi.okstate.edu/breeds/swine/>.
 - “The Different Breeds of Swine.” The Pig Site. Accessed July 5, 2007, from <http://www.thepigsite.com/backroom/69/breeds-of-swine>.
 - “Breeds of Swine.” Catawba Country Schools. Accessed July 5, 2007, from http://www.catawba.k12.nc.us/schoolpages/bunkerhill/eoc/thomas/animal%201/swinebreeds_files/frame.htm.
2. Print
 - Baker, Meelee, and Robert E Mikesell. *Animal Science Biology and Technology*. Danville, Ill.: Interstate Publishers, Inc., 1996.
 - Ensminger, M.E. *Stockman’s Handbook Digest*. Danville, Ill.: Interstate Publishers, Inc., 1992.

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- ❑ Gillespie, James R. *Modern Livestock and Poultry Production*. 5th ed. Albany: Delmar, 1997.
 - ❑ Lee, Jasper S., et al. *Introduction to Livestock and Poultry Production*. Danville, Ill.: Interstate Publishers, Inc., 1996.
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Interest Approach

Show photographs of the different breeds of swine. Ask students to identify and discuss the physical difference between the breeds. Have students create two different categories that illustrate the differences (ear type and coloration). Ask several students to discuss what categories they chose and how these categories distinguish differences between the breeds.

Communicate the Learning Objectives

1. Describe the identifying characteristics and histories of the common swine breeds.
2. Determine factors that influence breed selection.
3. Explain how hybrid hogs are developed.
4. Explain the differences between inbreeding, outcrossing, and crossbreeding.

Instructor Directions	Content Outline
<p>Objective 1</p> <p><i>Ask the class how many breeds of hogs they can name. Discuss the fact that there are relatively few breeds of swine compared to other animal species. Discuss ear type and coloration, which are the major visible differences between breeds. Hand out AS 1 and have students fill in the chart as you discuss the different beef breeds.</i></p> <p> AS 1 - Breeds of Hogs</p> <p><i>After completing the lesson, hand out AS 2 and have each student choose a different swine breed association. Students should complete AS 2 for the next class period.</i></p> <p> AS 2 - Researching Swine Breeds</p>	<p>Describe the identifying characteristics and histories of the common swine breeds.</p> <p>Berkshire</p> <ol style="list-style-type: none">1. Black with six white points and erect ears2. Produce high quality meat3. Imported from England in the early 1800s <p>Chester White</p> <ol style="list-style-type: none">1. White with small drooping ears2. Once popular for their durability and ruggedness3. Good mothering ability4. Originated in Pennsylvania in the early 1800s <p>Duroc</p> <ol style="list-style-type: none">1. Red with drooping ears2. Used to produce fast-growing market hogs3. Developed in the United States in the mid-1800s by crossing red hogs from New York and New Jersey <p>Hampshire</p> <ol style="list-style-type: none">1. Black with a white belt around the front of the body and erect ears2. Used to produce lean, heavily muscled offspring3. Imported from England during the early 1800s <p>Landrace</p> <ol style="list-style-type: none">1. White with large, droopy ears that cover the entire face

Instructor Directions	Content Outline
	<p>2. Used as a maternal breed because of their mothering ability</p> <p>3. Imported from Denmark in the 1930s</p> <p>Pietrain</p> <ol style="list-style-type: none"> 1. Spotted with erect ears 2. Leanest and most heavily muscled hogs; often carry a stress gene linked to meat quality problems 3. Used to produce terminal sires 4. Imported from Germany and Poland <p>Poland China</p> <ol style="list-style-type: none"> 1. Black with six white points (like Berkshires) but with drooping ears 2. Have been used to increase growth rates, but popularity has decreased because it has not kept up with the trend toward leanness 3. Originated in Ohio in the first half of the 19th century <p>Spotted</p> <ol style="list-style-type: none"> 1. Black and white spots and drooping ears 2. Have been used because of their rapid growth, but their numbers are small in comparison with other breeds used by the swine industry 3. Originated in Indiana from the Poland China breed 4. Purebred association formed in 1914 <p>Yorkshire</p> <ol style="list-style-type: none"> 1. White with erect ears 2. Used for mothering traits 3. Used for lean, heavily muscled, fast-growing market hogs 4. Imported from England in the early 1800s
<p>Objective 2</p> <p><i>Ask students who raise swine for projects which breeds they prefer. If few or no swine producers are present, begin by reviewing the various types of production systems. Stress to students that most commercial producers use a variety of breeds.</i></p>	<p>Determine factors that influence breed selection.</p> <ol style="list-style-type: none"> 1. Breeds used in the past 2. Litter sizes 3. Leanness 4. Muscle 5. Current growth rates 6. Efficiency in the conversion of feed to pork

Instructor Directions	Content Outline
<p>Objective 3</p> <p><i>Describe the trend in the swine industry toward larger operation that demand consistent genetics. Discuss with the class that companies have genetically selected hogs to be used for specific purposes.</i></p>	<p>Explain how hybrid hogs are developed.</p> <ol style="list-style-type: none"> Hybrid hogs are developed by crossing multiple breeds and selecting for desired traits. Companies offer hybrid hogs varying in use from a maternal to a terminal emphasis.
<p>Objective 4</p> <p><i>Review the Animal Reproduction unit from IML and discuss the various types of breeding systems.</i></p>	<p>Explain the differences between inbreeding, outcrossing, and crossbreeding.</p> <p>Inbreeding - mating two related animals in an attempt to concentrate desired traits in offspring</p> <ol style="list-style-type: none"> Closebreeding - mating closely related animals Linebreeding - mating animals that are slightly or distantly related (only one shared ancestor) <p>Outcrossing - mating unrelated animals of the same breed, which is more popular and safer than inbreeding because inbreeding can concentrate undesirable and even detrimental traits</p> <p>Crossbreeding - mating animals of two different breeds, resulting in a hybrid offspring that should maximize heterosis, or hybrid vigor</p>
<p>Application:</p> <p> AS 1 – Breeds of Hogs</p> <p> AS 2 – Researching Swine Breeds</p>	<p>Answers to AS 1 See Objective 1</p> <p>Answers to AS 2 Answers will vary based upon breed students choose.</p> <p>Other Activities:</p> <ol style="list-style-type: none"> Conduct more in-depth research on the history and development of breeds of swine used in the United States. Students can search the Internet for information on different breeds.
<p>Closure/Summary</p>	<p>Several breeds may be used in swine production. Producers should select breeds that fit their needs and use them in a breeding program that will improve their herd.</p>

Evaluation: Quiz**Answers**

1. i
 2. c
 3. e
 4. f
 5. d
 6. d
 7. c
 8. Answers should include three of the following: breeds used in the past, litter sizes, leanness, muscle, current growth rates, or efficiency in the conversion of feed to pork.
 9. Inbreeding is mating two related animals in an attempt to concentrate desired traits in offspring. Crossbreeding is mating animals of two different breeds, resulting in a hybrid offspring that should maximize heterosis, or hybrid vigor.
 10. Hybrid hogs are developed by crossing multiple breeds and selecting for desired traits.
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Lesson 2: Breeds of Swine

Name _____

Breeds of Hogs**Objective:** Identify the distinguishing characteristics of major swine breeds.**Fill in the table with information about each breed of swine listed.**

Breed Name	Color	Ear Type	Other Facts
Berkshire			
Chester White			
Duroc			
Hampshire			
Landrace			

Pietrain			
Poland China			
Spotted			
Yorkshire			

Lesson 2: Breeds of Swine

Name _____

Researching Swine Breeds

Objective: Become more familiar with the various breeds of swine.

Obtain the address of one of the major swine breed associations from your instructor. Write a letter to the association requesting information, pictures, videos, etc., for that breed.

When you receive the material from the breed association, prepare a report for the class. Your report should answer the following questions.

- What is the official name of the breed association?
- What is the history of the breed?
- When was the breed association formed?
- What are the standards for registration?
- What characteristics would disqualify an animal for registration?
- What are the important traits of the breed?

EVALUATION

Match the breed on the right with the best description on the left.

- | | |
|---|------------------|
| _____1. Black with six white points and drooping ears | a. Spotted |
| _____2. Belted | b. Berkshire |
| _____3. Leanest breed; used for terminal sires | c. Hampshire |
| _____4. White with erect ears; maternal breed | d. Duroc |
| _____5. Red; fast growing | e. Pietrain |
| | f. Yorkshire |
| | g. Landrace |
| | h. Chester White |
| | i. Poland China |

Circle the letter that corresponds to the best answer.

6. Crossbreeding is an attempt to maximize
- a. uniformity.
 - b. color.
 - c. efficiency.
 - d. heterosis.
7. Which breeding system involves mating unrelated animals of the same breed?
- a. Crossbreeding
 - b. Inbreeding
 - c. Outcrossing
 - d. Linebreeding

Complete the following short answer questions.

8. What are three factors that influence breed selection?

9. What is the difference between inbreeding and crossbreeding?

10. How are hybrid hogs developed?

Course	Agricultural Science I
Unit	Introduction to Swine Production
Lesson	Principles of Swine Selection
Estimated Time	50 minutes

Student Outcome

Use available information to select swine.

Learning Objectives

1. Identify the parts of a hog.
2. Identify the wholesale cuts of a hog.
3. Determine the criteria used in the selection of slaughter and feeder hogs.
4. Determine the criteria used in the selection of breeding hogs.

Grade Level Expectations

SC/EC/3/B/09-11/a

SC/LO/1/B/09-11/d

SC/LO/3/E/09-11/a

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. PowerPoint Slides
 - PPt 1 - Parts of a Hog
 - PPt 2 - Wholesale Cuts of Pork
 - PPt 3 - Leanness in Pork
 - PPt 4 - Leg Structure
 - PPt 5 - Swine Ratios
2. Activity Sheet
 - AS 1 - Parts of a Hog
3. *Introduction to Swine Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
4. *Introduction to Swine Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- Photograph of a high-quality market hog, gilt, or boar
- Photograph of a poor-quality pig

Supplemental Information

1. Internet Sites
 - "Mississippi 4-H Livestock Judging Manual." Mississippi State University Extension Service. Accessed July 6, 2007, from <http://msucares.com/pubs/publications/p2289swine.pdf>.
 - "Using Expected Progeny Differences for Swine Selection." Department of Animal Science. North Carolina State University. Accessed July 6, 2007, from <http://mark.asci.ncsu.edu/Publications/factsheets/801s.htm>.

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- ❑ “Boar Selection - Using Expected Progeny Differences.” College of Agriculture. University of Kentucky. Accessed July 6, 2007, from <http://www.uky.edu/Ag/AnimalSciences/pubs/asc153.pdf>.
 - ❑ “Swine Care, Selection and Showmanship.” Animal Science Publications. MU Extension. University of Missouri-Columbia. Accessed July 6, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02306.htm>.
 - ❑ “Selection of Swine Breeding Stock.” Oklahoma Cooperative Extension Service. Oklahoma State University. Accessed July 6, 2007 from <http://www.ansi.okstate.edu/youth%20extension/files/selection.swine.breeding.stock.pdf>.

2. Print

- ❑ Boggs Donald and Merkel, Robert. *Live Animal Carcass Evaluation and Selection Manual*. 4th ed. Dubuque: Kendall/Hunt Publishing Company, 2003.
 - ❑ Gillispie, James R. *Modern Livestock and Poultry Production*. 5th ed. Albany: Delmar, 1997.
 - ❑ Lee, Jasper S. et al. *Introduction to Livestock and Poultry Production*. Danville, Ill.: Interstate Publishers, Inc., 1996.
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Interest Approach

Show a photograph of a high-quality market hog, gilt, or boar. Compare to a photograph of a poor-quality pig. Discuss the differences between the two animals.

Communicate the Learning Objectives

1. Identify the parts of a hog.
2. Identify the wholesale cuts of a hog.
3. Determine the criteria used in the selection of slaughter and feeder hogs.
4. Determine the criteria used in the selection of breeding hogs.

Instructor Directions	Content Outline
<p>Objective 1</p> <p><i>Display PPT 1 and pass out AS 1 to students. While correctly labeling the diagram, point out that the swine industry has a unique terms for describing the parts of a hog.</i></p> <p> PPT 1 - Parts of a Hog</p> <p> AS 1 - Parts of a Hog</p>	<p>Identify the parts of a hog.</p> <ol style="list-style-type: none">1. Snout2. Cheek3. Jowl4. Eye5. Ear6. Poll7. Neck8. Shoulder9. Back10. Loin11. Rump12. Tail13. Ham14. Hind Leg15. Hock16. Hind flank17. Toe18. Belly19. Side20. Foreflank21. Foreleg22. Dewclaw23. Pastern

<p>Objective 2</p> <p><i>Describe what a wholesale cut of pork is. Display PPT 2 and discuss the different wholesale cuts of pork.</i></p> <p>☐ PPT 2 – Wholesale Cuts of Pork</p>	<p>Identify the wholesale cuts of a hog.</p> <ol style="list-style-type: none"> 1. Shoulder butt 2. Picnic shoulder 3. Loin 4. Side 5. Leg
<p>Objective 3</p> <p><i>Ask students what traits a high-quality slaughter hog has. Describe the swine industry's push for leaner pork because of consumer demands. Use PPT 3 to show leanness in a market hog.</i></p> <p>☐ PPT 3 – Leanness in Pork</p>	<p>Determine the criteria used in the selection of slaughter and feeder hogs.</p> <p>Slaughter hogs</p> <ol style="list-style-type: none"> 1. Leanness - must be mostly fat free to produce lean pork; should have an hourglass shape and be trim through the lower body 2. Muscle - should be heavily muscled, with good muscle expression 3. Size/age - should reach a market weight of 240 to 270 pounds, at an age of 140 to 170 days 4. Soundness - should have good feet and legs and be able to get up and down and move with relative ease <p>Feeder pigs</p> <ol style="list-style-type: none"> 1. Health - should be purchased from healthy herds and vaccinated against the major swine diseases 2. Soundness - must be able to move with ease 3. Lean/muscle - should be extremely lean and show muscle expression at 50 pounds to maintain leanness until market weight 4. Frame size - should be large framed because large-framed hogs mature later and stay leaner at higher weights
<p>Objective 4</p> <p><i>Ask the class what factors are used in selecting breeding hogs. Point out that the ultimate purpose of breeding animals is to produce lean, high-quality pork. Use PPT 4 to show the differences in skeletal soundness. Use PPT 5 to explain SPI, TSI, and MLI.</i></p>	<p>Determine the criteria used in the selection of breeding hogs.</p> <p>Visual</p> <ol style="list-style-type: none"> 1. Reproductive soundness <ol style="list-style-type: none"> a. A priority in selection b. Requires two functional testicles in boars c. Requires a fully developed vulva and a minimum of six and preferably seven teats per side in females

<ul style="list-style-type: none"> ☐ PPt 4 – Leg Structure ☐ PPt 5 – Swine Ratios 	<ol style="list-style-type: none"> 2. Skeletal soundness <ol style="list-style-type: none"> a. A priority in selection b. Must have proper skeletal angulation and move with ease to survive, grow, and reproduce in confinement on concrete floors 3. Growth/production <ol style="list-style-type: none"> a. Should be fast growing, based on the age of the hog at 230 pounds b. Should come from large litters and have a large body capacity 4. Frame size - should be large framed to produce lean animals at high weights 5. Leanness/muscling - should be leaner and more muscular than average with an adjusted backfat scan at 240 pounds between .6 and 1.1 inches and a loin eye area of more than six square inches <p>EPD information for SPI, MLI, TSI - All three indexes assign an average parent a specific value, while a higher value indicates a superior animal.</p> <ol style="list-style-type: none"> 1. Sow Productivity Index (SPI) <ol style="list-style-type: none"> a. Looks at EPDs for 21-day litter weight and number born alive b. Used when selecting animals for these reproductive traits 2. Terminal Sire Index (TSI) <ol style="list-style-type: none"> a. Looks at EPDs for the number of days to 230 pounds and for backfat b. Used to select terminal sires 3. Maternal Line Index (MLI) <ol style="list-style-type: none"> a. Looks at EPDs for both reproductive traits (21-day litter weight and number born alive) and growth data (days to 230 pounds and backfat) b. Used to select replacement gilts
<p>Application:</p> <ul style="list-style-type: none"> ☐ AS 1 – Parts of a Hog 	<p>Answers to AS 1</p> <ol style="list-style-type: none"> 1. Ear 2. Eye 3. Cheek 4. Snout 5. Jowl 6. Pastern 7. Dewclaw 8. Foreleg 9. Foreflank

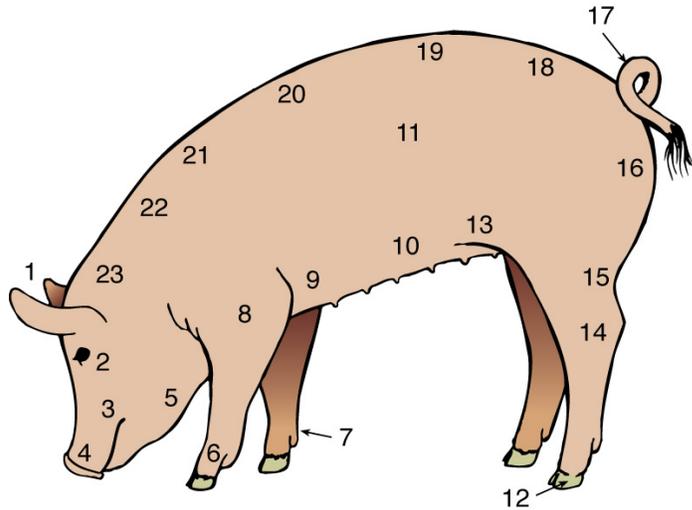
	<ol style="list-style-type: none"> 10. Belly 11. Side 12. Toe 13. Hind flank 14. Hock 15. Hind leg 16. Ham 17. Tail 18. Rump 19. Loin 20. Back 21. Shoulder 22. Neck 23. Poll <p>Other activities</p> <ol style="list-style-type: none"> 1. Show a video on swine selection and evaluation. 2. Obtain two market hogs to use in a live evaluation exercise. One animal should be lean and muscular; the other should be fatter and more lightly muscled. Have the students evaluate the hogs for leanness and muscle. If possible, send the hogs to the local locker plant and measure backfat and the loin eye area. Discuss the results with the class.
Closure/Summary	<p>Everyone involved in the swine industry should be familiar with the parts of a hog and the wholesale cuts of pork. Slaughter and feeder pig selection focuses on lean and muscular animals that can grow quickly and efficiently. Breeding hogs must be reproductively sound and skeletally sound and be able to produce lean, muscular, and fast-growing offspring. Producers can use the Sow Productivity Index, Terminal Sire Index, and Maternal Line Index to select breeding animals.</p>
Evaluation: Quiz	<p>Answers</p> <ol style="list-style-type: none"> 1. d 2. h 3. g 4. j 5. b 6. c 7. f 8. a 9. i

-
- | | |
|--|----------------------------------|
| | 10. e
11. b
12. d
13. c |
|--|----------------------------------|
-

Parts of a Hog

Objective: Identify the parts of a pig.

Label the parts of a hog on the drawing below.

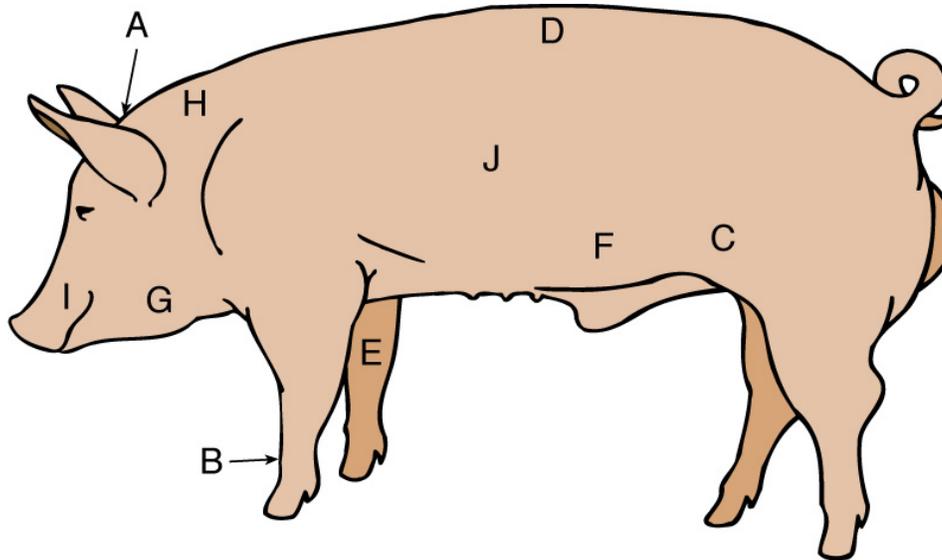


- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____
- 9. _____
- 10. _____
- 11. _____
- 12. _____

- 13. _____
- 14. _____
- 15. _____
- 16. _____
- 17. _____
- 18. _____
- 19. _____
- 20. _____
- 21. _____
- 22. _____
- 23. _____

EVALUATION

Write the letter from the diagram in the blank next to the name of that part of the pig.



1. ___ Loin

6. ___ Hind flank

2. ___ Neck

7. ___ Belly

3. ___ Jowl

8. ___ Poll

4. ___ Side

9. ___ Cheek

5. ___ Pastern

10. ___ Foreleg

Circle the letter that corresponds to the best answer.

11. Typically, how old is a market hog when it reaches 240 to 270 pounds?
- a. 110 to 140 days
 - b. 140 to 170 days
 - c. 190 to 220 days
 - d. Over one year
12. What does SPI mean?
- a. Special Pork Index
 - b. Swine Production Index
 - c. Size/Productivity Index
 - d. Sow Productivity Index
13. What shape does a lean hog have when viewed from the top?
- a. Circle
 - b. Rectangle
 - c. Hourglass
 - d. Oval

Complete the following short answer questions.

14. Why is skeletal soundness important in breeding hog selection?
15. Why should feeder pigs have a large frame?

16. What are the five wholesale cuts of pork?

a.

b.

c.

d.

e.

17. What is the difference between TSI and MLI? For what should each be used?

Course	Agricultural Science I
Unit	Introduction to Swine Production
Lesson	Production Systems
Estimated Time	50 minutes
Student Outcome	

Compare various production systems.

Learning Objectives

1. Determine the facility requirements for the different production systems.
2. Explain how production costs differ for each system.
3. Explain why the potential returns differ for each system.
4. Explain the available marketing options for each system.

Grade Level Expectations

SC/LO/1/B/09-11/b

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. Activity Sheet
 -  AS 1 – Feeder Pig Budget
2. *Introduction to Swine Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
3. *Introduction to Swine Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplemental Information

1. Internet Sites
 - Chiba, Lee I. "Swine Production Systems." *Swine Production Handbook*. College of Agriculture. Auburn University. Accessed July 6, 2007, from <http://www.ag.auburn.edu/~lchiba/sw02productionsystems.pdf>.
 - "Production Systems." United States Environmental Protection Agency. Accessed July 6, 2007, from <http://www.epa.gov/oecaagct/ag101/porksystems.html>.
 - Pitcher, Paul. "Swine Facilities." School of Veterinary Medicine. University of Pennsylvania. Accessed July 6, 2007, from <http://cal.vet.upenn.edu/swine/fac/hm.html>.
 - "Swine Publications." MU Extension. University of Missouri-Columbia. Accessed July 6, 2007, from <http://extension.missouri.edu/xplor/agguides/ansci/swine.htm>.
 - "Swine Production and Environmental Stewardship." United States Environmental Protection Agency. Accessed July 6, 2007, from <http://www.epa.gov/agriculture/swine.pdf>.

2. Print

- ❑ Ensminger, M. E. *Stockman's Handbook Digest*. Danville, Ill.: Interstate Publishers, Inc., 1992.
 - ❑ Gillispie, James R. *Modern Livestock and Poultry Production*. 5th ed. Albany: Delmar, 1997.
 - ❑ Lee, Jasper S. et al. *Introduction to Livestock and Poultry Production*. Danville, Ill.: Interstate Publishers, Inc., 1996.
 - ❑ Taylor, Robert, E., and Bogart, Ralph. *Scientific Farm Animal Production*. 3rd ed. New York: Macmillan Publishing, 1988.
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Interest Approach

Ask students how many of them are willing to take out a loan for hundreds of thousands of dollars to be involved in agriculture. Discuss the costs associated with swine production, particularly for facilities.

Communicate the Learning Objectives

1. Determine the the facility requirements for the different production systems.
2. Explain how production costs differ for each system.
3. Explain why potential returns differ for each system.
4. Explain the available marketing options for each system.

Instructor Directions	Content Outline
<p>Objective 1</p> <p><i>Ask students about the types of swine facilities with which they are familiar. Record the responses. Discuss the change to large total confinement operations in swine production. Have students complete AS 4.1.</i></p> <p> AS 1 - Feeder Pig Budget</p>	<p>Determine the facility requirements for the different production systems.</p> <p>Farrow-to-finish production</p> <ol style="list-style-type: none">1. Farrowing house2. Nursery3. Growing/finishing barns4. Gestation/breeding barns5. Feed handling and storage6. Manure storage <p>Feeder pig production</p> <ol style="list-style-type: none">1. Farrowing house2. Nursery3. Gestation/breeding barn4. Feed handling and storage5. Manure storage <p>Feeder pig finishing</p> <ol style="list-style-type: none">1. Growing/finishing barns2. Feed handling and storage3. Manure storage
<p>Objective 2</p> <p><i>Ask students what costs a producer would incur in producing hogs. Record the responses and discuss them in connection to the different production systems. Explain the large investment required to build a 300-sow facility.</i></p>	<p>Explain how production costs differ for each system.</p> <p>Producers will have two types of costs: fixed and variable costs.</p> <ol style="list-style-type: none">1. Fixed - similar for all producers despite the type of production system used<ol style="list-style-type: none">a. Depreciationb. Interest on loansc. Repairsd. Taxes

Instructor Directions	Content Outline
	<ul style="list-style-type: none"> e Insurance 2. Variable - differ depending on the production system <ul style="list-style-type: none"> a. Feed - major variable cost in raising swine b. Medications c. Veterinary care d. Equipment e. Facilities f. Cost of the stock <p>Costs for the various production systems differ.</p> <ul style="list-style-type: none"> 1. Farrow-to-finish production <ul style="list-style-type: none"> a. Has the most costs because producers own the animals for the longest time b. Must purchase breeding stock and maintain a breeding herd as well as raise market hogs 2. Feeder pig production <ul style="list-style-type: none"> a. Has costs similar to farrow-to-finish production b. Producers do not have to pay for the feed and facilities needed to finish slaughter hogs for market 3. Feeder pig finishing <ul style="list-style-type: none"> a. Has the fewest costs b. Producers do not have the expenses connected to breeding and raising young pigs
<p>Objective 3</p> <p><i>Ask students how various types of swine production generate returns. Record the responses. Discuss the variability of hog prices throughout the year.</i></p>	<p>Explain why potential returns differ for each system.</p> <p>Farrow-to-finish production</p> <ul style="list-style-type: none"> 1. Returns come from the sale of slaughter hogs. 2. Market hogs typically weigh 240 to 270 pounds and have an average price of \$40 to \$60 per cwt. <p>Feeder pig production</p> <ul style="list-style-type: none"> 1. Income is derived from selling feeder pigs. 2. Prices generally range from \$30 to \$55 with an average of \$45. <p>Feeder pig finishing</p> <ul style="list-style-type: none"> 1. Returns come from the sale of slaughter hogs. 2. While they may receive the same amount of money as farrow-to-finish producers, feeder pig finishers must pay for the feeder pigs.

Objective 4

Ask students where producers could sell hogs. Record the responses. Ask about local markets close to or in the community. Describe the differences between the various marketing options.

Explain the available marketing options for each system.

Farrow-to-finish/feeder pig finishers

1. Buying stations
 - a. They are owned and operated by packers.
 - b. They purchase hogs at a set price, which is generally based on the lean yield from the last three loads sold by the producer.
 - c. Producers deliver the hogs to the local station or send them directly to the processing plant.
2. Auction markets
 - a. They sell market hogs to the highest bidder.
 - b. They are usually privately owned.
 - c. The owner charges the producer a fee.
3. Network marketing - Independent producers cooperate to ship their hogs together to market a larger number of animals and get a better price for their hogs.
4. Lean-based systems
 - a. Producers send hogs directly to packing plant to be processed.
 - b. Carcasses are measured for backfat and muscling.
 - c. Measurements are put into a formula that calculates the percentage of muscle containing five percent fat.
 - d. The packing plant pays a premium for hogs with more than 49 percent muscle. Hogs with a lower percentage are penalized in price.
5. Niche markets
 - a. In value-added marketing, a pork producer might sell the actual food product to consumers or food distributors.
 - b. Producers may cooperate with meat processors or packing houses in value-added ventures; the producer pays the processor for slaughtering the hogs and processing the meat and then sells the meat.
 - c. Some producers may have their own slaughtering and processing facilities.
 - d. Producers hope to take a larger share of the profits along the food distribution channel.

	<p>Feeder pig producers</p> <ol style="list-style-type: none"> 1. They have a contract with a company or with individual feeder pig finishers that states the purchase price for each pig produced to the specified weight and/or age.
<p>Application:</p> <p> AS 1 - Feeder Pig Budget</p>	<p>Answers to AS 1</p> <p>Costs:</p> <p>Stock - $50 \text{ pigs} \times 50 \text{ pounds per pig} \times \\$0.90 \text{ per pound} = \\$2,250$</p> <p>Vaccinations - $\\$2 \text{ per pig} \times 50 \text{ pigs} = \\100</p> <p>Feed -</p> <p>250 pounds (market weight) - 50 pounds (starting weight) = 200 pounds</p> <p>$200 \text{ pounds} \times 3 \text{ pounds (feed to gain)} = 600 \text{ pounds of feed per pig}$</p> <p>$600 \text{ pounds of feed per pig} \times \\$14 \text{ per cwt} \times 50 \text{ pigs} = \\$4,200 (600 \times .14 \times 50)$</p> <p>Total cost:</p> <p>$\\$2,250 + \\$100 + \\$4,200 = \\$6,550$</p> <p>Returns:</p> <p>$\\$52 \div 100 \text{ pounds} = \\0.52 per pound</p> <p>$50 \text{ pigs} \times 250 \text{ pounds per pig} \times \\$0.52 \text{ per pound} = \\$6,500$</p> <p>Recommended action:</p> <p>No, I will not purchase the pigs, because it is not profitable.</p> <p>Other activities</p> <ol style="list-style-type: none"> 1. Prepare a detailed map showing the facilities required for a total confinement swine operation with 300 sows.
<p>Closure/Summary</p>	<p>The three swine production systems differ in the facilities required, costs, and potential returns. Producers must try to reduce costs and maximize returns to make a profit. Returns vary depending on production levels and market prices. The markets available to farrow-to-finish producers and feeder pig finishers are buying stations, auctions, network marketing, lean-based systems, and niche markets.</p>
<p>Evaluation: Quiz</p>	<p>Answers</p> <ol style="list-style-type: none"> 1. c

-
2. d
 3. b
 4. a
 5. Farrowing house, nursery, growing/finishing barns, gestation/breeding barns, feed handling and storage, and manure storage
 6. In auction markets, hogs are sold to the highest bidder, while they are purchased at a set price at buying stations.
 7. Farrow-to-finish producers have the most costs because they own the animals for the longest time. They must purchase breeding stock and maintain a breeding herd as well as raise market hogs.
 8. While they have the same potential return on a market hog as farrow-to-finish producers, feeder pig finishers must pay to purchase feeder pigs out of the returns.
-

Lesson 4: Production Systems

Name _____

Feeder Pig Budget**Objective:** Plan a budget taking into account costs and potential returns.

You are considering raising feeder pigs as an FFA SAE project. Your father has a concrete pen with a small shelter capable of holding 50, 250-pound pigs. You can borrow a self-feeder and waterer from your neighbor for your first set of pigs. Your neighbor is also willing to sell you 50 feeder pigs weighing 50 pounds for \$.90 per pound. You expect to purchase complete swine feed for \$14.00 per 100 pounds. The feed to gain ratio of the pigs will be 3:1, meaning that the pig will eat three pounds of feed for each pound it gains. The local veterinarian recommends vaccinating the pigs for health reasons, which will cost \$2 per pig. The futures market quotes market hog prices at \$52 per cwt.

Put together a budget showing costs, total cost, and returns. Show your calculations. Then circle the statement that reflects the recommended action based on the planned budget.

Costs**Returns**

Recommended action:

Yes, I will purchase the pigs.

No, I will not purchase the pigs, because it is not profitable.

EVALUATION

Circle the letter that corresponds to the best answer.

1. Which type of producer requires the fewest facilities?
 - a. Farrow-to-finish producers
 - b. Feeder pig producers
 - c. Feeder pig finishers
 - d. Corporate producers

2. Which of the following marketing options allows a producer to take a larger share of the profits along the food distribution channel?
 - a. Buying stations
 - b. Auction markets
 - c. Lean-based systems
 - d. Value-added marketing

3. What is the major production cost of raising hogs?
 - a. Vaccines
 - b. Feed
 - c. Equipment
 - d. Facilities

4. Which marketing option involves very specific calculations of the hog's percentage of muscle?
 - a. Lean-based marketing
 - b. Auctions
 - c. Buying stations
 - d. Direct sales to retailers

Course	Agricultural Science I
Unit	Introduction to Swine Production
Lesson	Herd Health
Estimated Time	50 minutes

Student Outcome

Develop a herd health program.

Learning Objectives

1. Identify the major swine diseases.
2. Explain what techniques reduce the spread of disease.
3. Identify herd health programs used for each production system.
4. Explain the proper techniques for administration of medications.

Grade Level Expectations

Resources, Supplies & Equipment, and Supplemental Information

1. PowerPoint Slides
 - PPT 1 - Injection Sites
2. Activity Sheets
 - AS 1 - Swine Diseases
 - AS 2 - Swine Antibiotics
3. *Introduction to Swine Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
4. *Introduction to Swine Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- A variety of pig medications

Supplemental Information

1. Internet Sites
 - "Swine Publications – Feeding and Health." MU Extension. University of Missouri-Columbia. Accessed July 10, 2007, from <http://extension.missouri.edu/xplor/agguides/ansci/swine.htm>.
 - "Diseases of Swine." SwineFile.com. Accessed July 10, 2007, from <http://www.swinefile.com/Artdis.htm>.
 - "Swine Health." EDIS publication system. University of Florida Institute of Food and Agricultural Sciences. Accessed July 10, 2007, from http://edis.ifas.ufl.edu/TOPIC_Swine_Health.
 - Walker, Randy. "Swine Health Program." EDIS publication system. University of Florida Institute of Food and Agricultural Sciences. Accessed July 10, 2007, from <http://edis.ifas.ufl.edu/pdffiles/AA/AA08500.pdf>.

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- ❑ "Swine Health." SwineFile.com. Accessed July 10, 2007, from <http://www.swinefile.com/hrdhealth.htm>.

2. Print

- ❑ Baker, Meelee and Robert E. Mikesell. *Animal Science Biology and Technology*. Danville, Ill.: Interstate Publishers, Inc., 1996.
 - ❑ Ensminger, M.E. *Stockman's Handbook Digest*. Danville, Ill.: Interstate Publishers, Inc., 1992.
 - ❑ Gillespie, James R. *Modern Livestock and Poultry Production*. 5th ed. Albany: Delmar, 1997.
 - ❑ Lee, Jasper S., et at. *Introduction to Livestock and Poultry Production*. Danville, Ill.: Interstate Publishers, Inc., 1996.
 - ❑ *Pork Issues Handbook*. Des Moines: National Pork Producers Council, 2005/2006.
 - ❑ *Pork Quality Assurance Levels I, II, III*. Des Moines: National Pork Producers Council, 1996.
 - ❑ *Swine Care Handbook*. Des Moines: National Pork Producers Council, 1996.
 - ❑ Taylor, Robert E., and Bogart, Ralph. *Scientific Farm Animal Production*. 3rd ed. New York: Macmillan Publishing, 1988.
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Interest Approach

Describe the effects a serious outbreak of disease can have on a swine herd (e.g., PRRS can cause 50 to 100 percent of gestating sows and gilts to abort). Show students a variety of pig medications and ask several of them to report what the medications could be used for in a swine operation.

Communicate the Learning Objectives

1. Identify the major swine diseases.
2. Explain what techniques reduce the spread of disease.
3. Identify herd health programs used for each production system.
4. Explain the proper techniques for administration of medications.

Instructor Directions	Content Outline
<p>Objective 1</p> <p><i>Have the class list the major swine diseases. Next, ask students if the diseases can be controlled. Have students complete AS 1.</i></p> <p> AS 1 - Swine Diseases</p>	<p>Identify the major swine diseases.</p> <p>Erysipelas</p> <ol style="list-style-type: none">1. Symptoms - slow growth, lameness and red skin lesions2. Prevention - vaccinations at six to eight weeks of age <p>Leptospirosis</p> <ol style="list-style-type: none">1. Symptoms - abortions and birth of weak or dead pigs2. Prevention - vaccinations for males and females with females vaccinated two to three weeks before breeding <p>Pneumonia</p> <ol style="list-style-type: none">1. Symptoms - chronic coughing and reduction in growth and efficiency2. Prevention - vaccinations for some strains and good management practices (good sanitation, isolation of infected animals, and avoiding exposure to cool and drafty conditions) <p>Porcine reproductive and respiratory syndrome (PRRS) - most profound health problem in swine herds</p> <ol style="list-style-type: none">1. Symptoms - abortions, mummified pigs, stillbirths, and chronic respiratory problems2. Prevention - vaccinations and buying breeding stock free of the disease

Instructor Directions	Content Outline
	<p>Pseudorabies</p> <ol style="list-style-type: none"> 1. Symptoms - high death rate in young pigs, paralysis, fever, abortions, and stillbirths 2. Prevention - purchase of breeding stock from disease-free herds and vaccinations <p>Rhinitis</p> <ol style="list-style-type: none"> 1. Symptoms - twisted snout from degeneration of the bones 2. Prevention - vaccinations of sows and baby pigs <p>Transmissible gastroenteritis (TGE)</p> <ol style="list-style-type: none"> 1. Symptoms - diarrhea and death rate close to 100 percent in young pigs 2. Prevention - vaccinations and proper sanitation
<p>Objective 2</p> <p><i>Ask students what techniques swine producers can use to help reduce the spread of disease. Record the responses. Discuss each method in detail with the class.</i></p>	<p>Explain what techniques reduce the spread of disease.</p> <p>Biosecurity - preventive measures designed to reduce exposure to disease by isolating diseased animals, keeping them from contaminating others</p> <ol style="list-style-type: none"> 1. Operations limit the number of outside visitors. 2. Visitors must shower in and put on clean clothes and shoes before entering the facilities. 3. Access to critical areas like the farrowing house and nursery is limited. 4. Certain people can only enter particular buildings. <p>Proper sanitation</p> <ol style="list-style-type: none"> 1. Animals entering the facilities are cleaned and washed. 2. Buildings are cleaned and disinfected after the pigs are moved out of them. <p>Purchase and use of disease-free breeding stock</p> <ol style="list-style-type: none"> 1. Only disease-free breeding stock from producers with strict health programs should be used; their herds may be validated as specific pathogen free (SPF) herds. 2. Blood tests are done before sale to check for disease. 3. All incoming breeding stock should go through an isolation and acclimation period lasting 45 to 60 days in which they are tested for diseases and exposed to cull animals from the facility.

Instructor Directions	Content Outline
	<p>4. Using artificial insemination can reduce the spread of disease.</p>
<p>Objective 3</p> <p><i>Ask students what types of herd health programs are used in swine production. Point out that every producer has different health challenges. He or she should design a health program to fit his or her needs.</i></p>	<p>Identify herd health programs used for each production system.</p> <p>Farrow-to-finish producers - Involved in all phases of production; have the most extensive herd health program because they must prevent health problems in the breeding, farrowing, and growth phase</p> <ol style="list-style-type: none"> 1. Use blood tests to reveal health problems, and target those problems with vaccines. 2. Buy disease-free breeding stock. 3. Practice biosecurity. 4. Administer preventive antibiotics in feed. 5. Control external and internal parasites. <p>Feeder pig producers</p> <ol style="list-style-type: none"> 1. Purchase disease-free breeding stock. 2. Practice biosecurity. 3. Take blood samples to reveal health problems, and vaccinate against them. 4. Use preventive antibiotics in feed. 5. Control external and internal parasites. <p>Feeder pig finishers - Typically have the fewest problems with disease since they own the pigs for a short time, with no breeding, gestation, or farrowing</p> <ol style="list-style-type: none"> 1. Purchase vaccinated feeder pigs. 2. Use antibiotics in the feed. 3. Practice biosecurity measures. 4. Treat animals for parasites.
<p>Objective 4</p> <p><i>Ask students how medications and vaccines are administered to hogs. Record the three main methods. Use PPT 1 to illustrate proper injection sites. Have students complete AS 2.</i></p> <p><input type="checkbox"/> PPT 1 - Injection Sites</p>	<p>Explain the proper techniques for administration of medications.</p> <p>Subcutaneous injections (Sub-Q)</p> <ol style="list-style-type: none"> 1. Given between the skin and muscle 2. Given behind the front leg in the loose skin of the foreflank 3. Recommended because of the potential for carcass damage when injections are made into muscle tissue

Instructor Directions	Content Outline
<p>AS 2 - Swine Antibiotics</p>	<p>Intramuscular injections (IM)</p> <ol style="list-style-type: none"> Made into the muscle Always given in the neck and never in the rump or ham because the meat from the neck area is of a lower value <p>Medicated feed - Contains small amounts of USDA-approved antibiotics that the pig consumes as it feeds; prevents disease and promotes growth</p>
<p>Application:</p> <p>AS 1 - Swine Diseases</p> <p>AS 2 - Swine Antibiotics</p>	<p>Answers to AS 1</p> <p>Erysipelas</p> <ol style="list-style-type: none"> Symptoms - slow growth, lameness and skin lesions Prevention - vaccinations at six to eight weeks of age <p>Leptospirosis</p> <ol style="list-style-type: none"> Symptoms - abortions and birth of weak or dead pigs Prevention - vaccinations for males and females with females vaccinated two to three weeks before breeding <p>Pneumonia</p> <ol style="list-style-type: none"> Symptoms - chronic coughing and reduction in growth and efficiency Prevention - vaccinations for some strains and good management practices (good sanitation, isolation of infected animals, and avoiding exposure to cool and drafty conditions) <p>Porcine reproductive and respiratory syndrome (PRRS)</p> <ol style="list-style-type: none"> Symptoms - abortions, mummified pigs, stillbirths, and chronic respiratory problems Prevention - vaccinations and buying breeding stock free of the disease <p>Pseudorabies</p> <ol style="list-style-type: none"> Symptoms - high death rate in young pigs, paralysis, fever, abortions, and stillbirths Prevention - purchase of breeding stock from disease-free herds and vaccinations <p>Rhinitis</p> <ol style="list-style-type: none"> Symptoms - twisted snout from degeneration of bones Prevention - vaccinations of sows and baby pigs <p>Transmissible gastroenteritis (TGE)</p> <ol style="list-style-type: none"> Symptoms - diarrhea and death rate close to 100 percent in young pigs Prevention - vaccinations and proper sanitation

Instructor Directions	Content Outline
	<p>Answers to AS 2 Answers will vary.</p> <p>Other activities</p> <ol style="list-style-type: none"> 1. Have a veterinarian visit the class or take a field trip to a veterinary clinic to discuss swine herd health programs. 2. Have students research a swine disease in more detail and report on it to the class.
Closure/Summary	<p>Herd health and disease prevention are major concerns of swine producers. Several diseases can affect the swine herd. Biosecurity is an inexpensive method of preventing these diseases from spreading through a herd. Other ways to control the spread of disease are through proper sanitation and the use of disease-free breeding stock. A herd health program should include blood tests to reveal health problems; the results of the tests form the basis of a proper vaccination program. Subcutaneous injections should be used whenever possible.</p>
Evaluation: Quiz	<p>Answers</p> <ol style="list-style-type: none"> 1. a 2. c 3. b 4. d 5. d 6. These measures are designed to reduce exposure to disease by isolating diseased animals, keeping them from contaminating others. 7. Subcutaneous injections are recommended because of the potential for carcass damage when injections are made into muscle tissue. 8. Students may list any two of the following: purchase disease-free breeding stock, practice biosecurity, take blood samples to reveal health problems and vaccinate against them, use preventive antibiotics in feed, and control external and internal parasites.

Lesson 5: Herd Health

Name _____

Swine Diseases**Objective:** Describe the major swine diseases.**Complete the table by listing the symptoms of the diseases and ways to prevent animals from getting them.**

Disease	Symptoms	Prevention
Erysipelas		
Leptospirosis		
Pneumonia		
Porcine reproductive and respiratory syndrome (PRRS)		
Pseudorabies		

Disease	Symptoms	Prevention
Rhinitis		
Transmissible gastroenteritis (TGE)		

Swine Antibiotics

Objective: Become familiar with commonly used antibiotics.

Using a veterinary supply catalog that carries antibiotics, complete the chart. Detail the name of the drug, its use, withdrawal time, and any restrictions on it. The antibiotics can be given in injections or placed in feed.

Name	Uses	Withdrawal Time	Restrictions

EVALUATION

Circle the letter that corresponds to the best answer.

1. Skin lesions are a symptom of which disease?
 - a. Erysipelas
 - b. Pneumonia
 - c. TGE
 - d. Rhinitis

2. Which of the following is not an aspect of biosecurity?
 - a. Operations limit the number of outside visitors.
 - b. Access to critical areas like the farrowing house and nursery is limited.
 - c. Buildings are cleaned and disinfected after pigs are moved out of them.
 - d. Certain people can only enter particular buildings.

3. Which of the following production systems has the most extensive herd health program?
 - a. Feeder pig producers
 - b. Farrow-to-finish producers
 - c. Feeder pig finishers
 - d. Contract finishers

4. What is the most profound health problem in swine herds?
 - a. Erysipelas
 - b. Leptospirosis
 - c. Pseudorabies
 - d. PRRS

5. What disease results in the degeneration of the bones of the pig's snout?
 - a. PRRS
 - b. Pneumonia
 - c. TGE
 - d. Rhinitis

Course	Agricultural Science I
Unit	Introduction to Swine Production
Lesson	Herd Management
Estimated Time	50 minutes

Student Outcome

Identify management factors important to profitable hog production.

Learning Objectives

1. Describe how nutrition affects herd health.
2. Identify feeding phases for different stages of hog production.
3. Explain how production efficiency is measured in swine.
4. Identify factors to consider in reproduction.
5. Identify the steps in processing of baby pigs.

Grade Level Expectations

SC/ST/1/B/09-11/a SC/ST/1/C/09-11/a SC/ST/3/B/09-11/a
 SC/ST/3/B/09-11/b SC/ST/3/B/09-11/c

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. PowerPoint Slides
 - PPt 1 – Ear Notching
 - PPt 2 – Changing Dietary Requirements
 - PPt 3 – Ear Notching Diagram
2. Activity Sheet
 - AS 1 – Ear Notching
3. *Introduction to Swine Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
4. *Introduction to Swine Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- Ear notching device
- Cutouts of pig ears for demonstrating how to notch ears

Supplemental Information

1. Internet Sites
 - "Identifying Pigs." Accessed July 12, 2007, from <http://www2.dpi.qld.gov.au/pigs/4305.html>.
 - "Care of Pigs from Farrowing to Weaning." MU Extension. University of Missouri-Columbia. Accessed July 12, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02500.htm>.
 - "Nutritional Management: Swine." Dairy and Animal Science. Pennsylvania State University. Accessed July 12, 2007, from

<http://www.das.psu.edu/nutrientmanagement/swine/>.

- ❑ Chiba, Lee I. "Baby Pig Management." *Swine Production Handbook*. Accessed July 12, 2007, from <http://www.ag.auburn.edu/~lchiba/sw06babypigs.pdf>.

2. Print

- ❑ Baker, Meelee and Mikesell. *Animal Science Biology and Technology*. Danville, Ill.: Interstate Publishers, Inc., 1996
 - ❑ Bobbs, Donald L., and Merkel, Robert A. *Live Animal Carcass Evaluation and Selection Manual*. 4th ed. Dubuque: Kendall/Hunt Publishing Company, 1993.
 - ❑ Ensminger, M.E. *Stockman's Handbook Digest*. Danville, Ill.: Interstate Publishers, Inc. 1992.
 - ❑ Gillespie, James R. *Modern Livestock and Poultry Production*. 5th ed. Albany: Delmar, 1997.
 - ❑ Lee, Jasper S., et al. *Introduction to Livestock and Poultry Production*. Danville, Ill.: Interstate Publishers, Inc., 1996
 - ❑ *Swine Care Handbook*. Des Moines: National Pork Producers Council, 2004
 - ❑ Taylor, Robert E.,m and Bogart Ralph. *Scientific Farm Animal Production*. 3rd ed. New York: Macmillan Publishing, 1998.
-

Interest Approach

Show students PPt 1 with ear notches drawn in. Have students try to figure out the litter number and pig number. Have them explain why such a system would be used to identify pigs. Using the ear notching device and the cutouts of pig ears, notch pig number 12-4. Explain why notching is important to herd management.

Communicate the Learning Objectives

1. Describe how nutrition affects herd health.
2. Identify feeding phases for different stages of hog production.
3. Explain how production efficiency is measured in swine.
4. Identify factors to consider in reproduction.
5. Identify the steps in processing of baby pigs.

Instructor Directions	Content Outline
<p>Objective 1</p> <p><i>Ask students how nutrition affects herd health. Describe the simple stomach found in swine and discuss why swine diets are high in grain. List the components of a balanced diet.</i></p>	<p>Describe how nutrition affects herd health.</p> <p>Animals that are suffering from nutrient deficiencies are more susceptible to disease-causing organisms and do not achieve maximum performance.</p> <ol style="list-style-type: none">1. Swine require proper levels of energy (from carbohydrates and fats), protein, vitamins, minerals, and water.2. Producers should design a feed ration that meets the requirements for the animal.
<p>Objective 2</p> <p><i>Ask students to name different phases of swine production. List the phases. Next, ask students how swine are fed for each of these stages. Stress to the class that different phases of swine production have different nutritional requirements, and discuss the differences between them. Use PPt 2 to illustrate changing dietary requirements in pigs.</i></p> <p><input type="checkbox"/> PPt 2 - Changing Dietary Requirements</p>	<p>Identify feeding phases for different stages of hog production.</p> <p>Gestation</p> <ol style="list-style-type: none">1. Gestation diets are generally lower in protein than any other swine diet.2. Gestating sows and gilts are usually fed four to six pounds of feed per head per day.3. Extra fiber is usually added to the diet shortly before farrowing to act as a laxative and reduce constipation.4. A good supply of fresh water should be available at farrowing time. <p>Lactation</p> <ol style="list-style-type: none">1. Lactation diets are higher in protein and energy than gestation diets to meet the energy needs of the female.2. The amount fed to the sows is gradually increased to full feed within five to seven days after farrowing.

Instructor Directions	Content Outline
	<ol style="list-style-type: none"> 3. Generally, producers will feed lactating sows between twelve and twenty pounds per head per day. 4. Lactating sows also require larger amounts of water than other pigs. <p>Weaning</p> <ol style="list-style-type: none"> 1. Weaning diets are the most critical swine diets because they provide the first feed the baby pig will consume. 2. These diets are usually very high in the amino acids found in protein because weaning is a critical time for muscle growth, which requires protein. 3. The level of protein is generally 18 to 22 percent, but it may be as high 26 percent. 4. Feed generally contains milk and blood proteins. 5. As the pig grows, the levels of protein are reduced because the pig's requirements decrease. 6. Easy access to water is important as well. <p>Growing/finishing diets</p> <ol style="list-style-type: none"> 1. The level of protein is usually 14 to 16 percent. 2. The amount of protein in the diet is gradually reduced. 3. Many producers feed gilts separately from barrows, since gilts generally grow more slowly than barrows and require more protein to reach maximum levels of performance.
<p>Objective 3</p> <p><i>Ask students how swine producers measure efficiency. Record the responses. Discuss the importance of each method and what numbers would be acceptable to producers.</i></p>	<p>Explain how production efficiency is measured in swine.</p> <p>Days to 230 pounds</p> <ol style="list-style-type: none"> 1. This measure reflects the growth rate of market hogs. 2. Fewer days on feed usually means that feed costs will be lower and translates into the ability to produce more animals. <p>Feed to gain</p> <ol style="list-style-type: none"> 1. Feed to gain is a measure of how many pounds of feed are necessary to produce a pound of gain in the pig. 2. Pounds of feed fed is divided by pounds of pork produced.

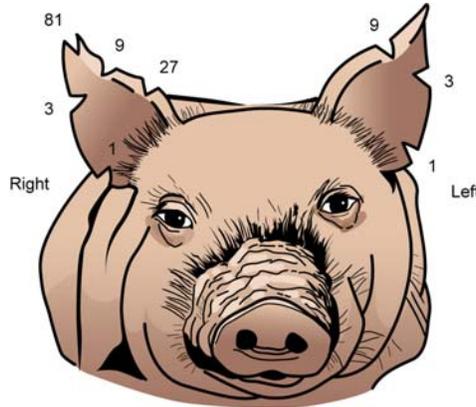
Instructor Directions	Content Outline
	<p>3. A lower feed to gain ratio is desirable, since the pigs will then require less feed and feed costs will be lower.</p> <p>Gain to feed</p> <ol style="list-style-type: none"> 1. Gain to feed measures the efficiency of gain. 2. Pounds of gain is divided by pounds of feed used. 3. High numbers are desirable.
<p>Objective 4</p> <p><i>Have students list some considerations concerning the reproductive management of a swine farm. List the factors and discuss each in more detail.</i></p>	<p>Identify factors to consider in reproduction.</p> <ol style="list-style-type: none"> 1. Swine have a gestation cycle that averages 114 days, so producers need to keep accurate breeding records to know which females will farrow and when farrowing will occur. 2. Producers may balance litter size by fostering pigs from larger litters to sows with smaller litters; fostering should take place within 24 hours of birth for both litters. <ol style="list-style-type: none"> a. Fostering achieves a more uniform weaning size. b. It increases the survival rate. 3. Piglets are weaned when they are between 14 and 28 days of age. <ol style="list-style-type: none"> a. Most producers wean piglets from a group of sows on the same day to maintain the farrowing group. b. Sows will usually come into estrus three to seven days after weaning. c. Most producers will breed the female as soon after weaning as possible to maximize production. 4. Artificial insemination (AI) is becoming more common. <ol style="list-style-type: none"> a. Producers can purchase semen or collect semen from their own superior boars. b. AI allows producers to use superior boars more extensively. c. Producers will determine which female is in estrus and typically AI each female twice. 5. Sows usually have three years of productive life; after three years of farrowing, they generally experience a decline in productivity.

<p>Objective 5</p> <p><i>Ask students what needs to be done to baby pigs after birth. If possible, bring a litter of pigs in for a demonstration or go to a swine operation and observe how a litter of baby pigs is processed. Use Ppt 3 as a guide for a discussion of ear notching. Have students complete AS 1.</i></p> <p> Ppt 3 - Ear Notching Diagram</p> <p> AS 1 - Ear Notching</p>	<p>Identify the steps in processing of baby pigs.</p> <ol style="list-style-type: none"> 1. Remove the navel cord and apply iodine to prevent infection. 2. Clip the needle teeth. <ol style="list-style-type: none"> a. Clipping prevents injury to the sow's udder. b. It prevents injury to other pigs when fighting. 3. Dock the tail to prevent tail biting. 4. Give an iron shot to prevent anemia. 5. Castrate the males at processing, or at one week of age. 6. Notch ears using a standard ear notching system. <ol style="list-style-type: none"> a. The ear is divided into quadrants; each quadrant can have one or two notches. b. Notches on the right ear indicate the litter number. c. Notches on the left ear identify the number of the piglet. d. Adding the numbers of the notches on each ear gives the litter number and piglet number for that animal. e. The top of the right ear is notched to designate litter 81.
<p>Application:</p> <p> AS 1 - Ear Notching</p>	<p>Answers to AS 1</p> <ol style="list-style-type: none"> 1. 5, 3 2. 10, 2 3. 9, 9 4. 27, 4 5. 51, 2 6. 2, 1 7. 12, 10 8. 100, 10 9. 11, 8 10. 7, 5 <p>Other activities</p> <ol style="list-style-type: none"> 1. Obtain various feed brochures and develop a feeding program for a farrow-to-finish production system.

Closure/Summary	Swine must be fed diets with proper nutrition to ensure health and maximum growth. Swine producers should use phase feeding to meet the nutritional needs of the animals fed. Producers can use several methods to measure the efficiency of production in their hogs. They also need to manage reproduction in the swine herd properly to maximize production. Baby pigs should be processed within one day of farrowing.
Evaluation: Quiz	Answers 1. d 2. d 3. b 4. c 5. How many pounds of feed are necessary to produce a pound of gain in the pig 6. Animals that are suffering from nutrient deficiencies are more susceptible to disease-causing organisms and do not achieve maximum performance. 7. 12, 10 8. 100, 10

Ear Notching

Objective: Determine the litter number and pig number using the universal ear notching system.



In the standard ear notching system, the litter number (right ear) is read first, followed by the pig number (left ear). Determine the notch number by adding the notches in the same ear together using the key above. For example, the following pig is identified as litter #12, pig #2.



Identify the litter number and pig number for each pig illustrated.



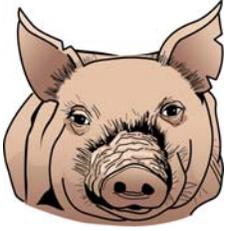
1. _____



2. _____



3. _____



4. _____



5. _____



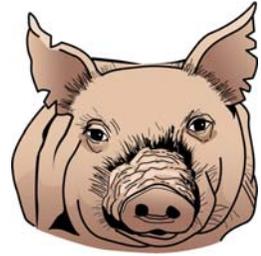
6. _____



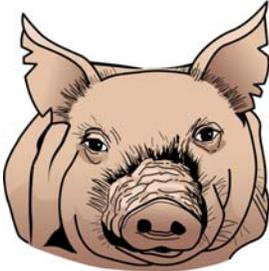
7. _____



8. _____



9. _____



10. _____

UNIT - INTRODUCTION TO SWINE PRODUCTION Name _____

Lesson 6: Herd Management

Date _____

EVALUATION

Circle the letter that corresponds to the best answer.

1. Which of the following diets are the most critical for the future development of a pig?
 - a. Farrowing
 - b. Gestation
 - c. Lactation
 - d. Weaning

2. What is the average length of the gestation cycle for swine?
 - a. 110 days
 - b. 200 days
 - c. 150 days
 - d. 114 days

3. What prevents anemia in baby pigs?
 - a. Milk
 - b. Iron shots
 - c. Leptospirosis vaccine
 - d. Carbohydrates

4. As the pig grows, the levels of what nutrient can be decreased?
 - a. Carbohydrates
 - b. Fats
 - c. Protein
 - d. Minerals

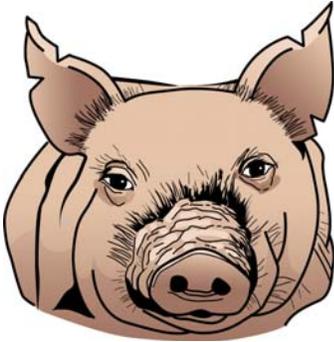
Complete the following short answer questions.

5. What does feed to gain measure?

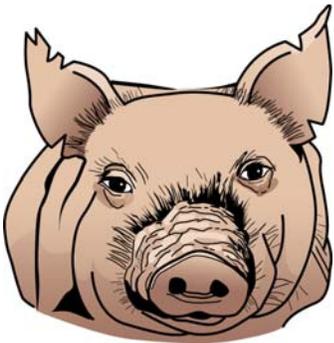
6. What is the effect of nutrient deficiencies on the swine herd?

Identify the litter number and pig number for the pigs illustrated below.

7. _____



8. _____



Course	Agricultural Science I
Unit	Introduction to Swine Production
Lesson	Industry Concerns
Estimated Time	50 minutes

Student Outcome

Assess issues concerning the swine industry.

Learning Objectives

1. Identify consumer concerns.
2. Explain how manure nutrients are managed on swine farms.
3. Explain the difference between animal rights and animal welfare.
4. Explain how the swine industry is addressing consumer concerns.

Grade Level Expectations

SC/ST/1/B/09-11/a	SC/ST/1/C/09-11/a	SC/ST/3/B/09-11/a
SC/ST/3/B/09-11/b	SC/ST/3/B/09-11/c	SC/ST/3/D/09-11/a

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. Activity Sheet
 -  AS 1 – Debate – Swine Production and the Environment
2. *Introduction to Swine Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
3. *Introduction to Swine Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplemental Information

1. Internet Sites
 - “Conservation and the Environment.” National Pork Producers Council. Accessed July 17, 2007, from http://www.nppc.org/hot_topics/environment.html.
 - “Gasses and Odors from Swine Waste.” MU Extension. University of Missouri-Columbia. Accessed July 17, 2007, from <http://extension.missouri.edu/explore/agguides/agengin/g01880.htm>.
 - “Livestock Confinement Dust and Gasses.” University Extension. Iowa State University. Accessed July 17, 2007, from <http://www.cdc.gov/nasd/docs/d001501-d001600/d001501/d001501.html>.
 - “Livestock – Pork Production.” Extension Service. Mississippi State University. Accessed July 17, 2007, from <http://msucares.com/livestock/swine/index.html>.
2. Print
 - Guide to Environmental Quality in Pork Production*. Des Moines: National Pork Producers Council, 1993.
 - Pork Issues Handbook*. Des Moines: National Pork Producers Council, 1996/1997.
 - Pork Quality Assurance I, II, III*. Des Moines: National Pork Producers Council, 1994.

❑ *Swine Care Handbook*. Des Moines: National Pork Producers Council, 1996.

Interest Approach

Ask students whether they would like a large confinement operation to be built near their homes. Discuss the responses.

Communicate the Learning Objectives

1. Identify consumer concerns.
2. Explain how manure nutrients are managed on swine farms.
3. Explain the difference between animal rights and animal welfare.
4. Explain how the swine industry is addressing consumer concerns.

Instructor Directions	Content Outline
<p>Objective 1</p> <p><i>Ask the class to list current consumer concerns about swine production. Record the responses and discuss each of them.</i></p>	<p>Identify consumer concerns.</p> <ol style="list-style-type: none">1. Effect on the environment<ol style="list-style-type: none">a. Odor emissionb. Pollution of ground water and waterways from untreated wastes in leaking storage facilities2. Safety of pork - residues from antibiotics3. Animal welfare<ol style="list-style-type: none">a. Amount of room given to each animalb. Number of pigs in each buildingc. Failure of temperature regulationd. Inability to escape fire4. Animal rights
<p>Objective 2</p> <p><i>Ask students how wastes are used on swine farms. Next, ask how producers manage the nutrients contained in the wastes. Emphasize that producers have to manage the nutrients contained in manure to prevent groundwater contamination from nutrient leaching. List the management steps.</i></p>	<p>Explain how manure nutrients are managed on swine farms.</p> <p>Storage</p> <ol style="list-style-type: none">1. Lagoon<ol style="list-style-type: none">a. Similar to a pondb. Designed to catch runoff from outside animal lots or to hold waste piped from buildingsc. Stores waste while the solids are broken down by bacteria into liquid and gasesd. Must be sealed to prevent leaking and may require a liner in some soilse. Must be approved by the Department of Natural Resources before construction2. Pit structure<ol style="list-style-type: none">a. Concrete pits two to eight feet deep found directly below the confinement buildingb. Collect and store liquid and solid wastes that drop through the slotted floor of the building

Instructor Directions	Content Outline
	<ul style="list-style-type: none"> c. Conserves nutrients during storage d. Must be sealed with no leaks <p>Land application</p> <ol style="list-style-type: none"> 1. Irrigation <ul style="list-style-type: none"> a. Involves pumping liquid waste through sprinklers on top of the ground b. Should be monitored constantly to ensure that waste is not leaking from the equipment and causing runoff c. Preferably done in spring and summer 2. Injection <ul style="list-style-type: none"> a. Mechanical procedure involving injecting, or “knifing,” the waste into the soil b. Places manure directly under the soil surface, allowing nutrients to be used more effectively by plants c. Reduces odor and runoff but is more time consuming and labor intensive <p>Maintaining a stable nutrient balance - Involves testing the soil for nutrient composition and testing the waste for nutrient content, allowing the producer to gauge how much liquid waste can be applied</p>
<p>Objective 3</p> <p><i>Have students explain the difference between animal welfare and animal rights. Discuss the importance of providing for the welfare of animals from the producer’s perspective.</i></p>	<p>Describe the difference between animal rights and animal welfare.</p> <p>Animal rights</p> <ol style="list-style-type: none"> 1. Belief that animals should not be used as resources by humans 2. Belief that animals should have the same rights as humans <p>Animal welfare</p> <ol style="list-style-type: none"> 1. Calls for the humane use of animals 2. Belief that use of animals brings a responsibility to provide appropriate care to the animals 3. Most pork producers are concerned with the welfare of the animals they raise, since ignoring their needs will affect growth and production, and ultimately influence profits.

<p>Objective 4</p> <p><i>Ask students how the swine industry is addressing consumer concerns discussed in Objective 1.</i></p> <p><i>After the discussion, have students carry out the debate outlined on AS 1. Divide the class into two groups. Allow the groups to research the subject in preparation for the debate. Moderate the debate for the students.</i></p> <p> AS 1 - Debate - Swine Production and the Environment</p>	<p>Explain how the swine industry is addressing consumer concerns.</p> <p>Effect on the environment</p> <ol style="list-style-type: none"> 1. Environmental Assurance Program - developed to encourage producers to assess whether they are adequately protecting the environment 2. Research by the NPPC and state associations into reducing odor, protecting ground and surface water, and better utilizing nutrients from swine wastes <ol style="list-style-type: none"> a. Modifications to swine diets that can reduce odors b. Products that can be added to diets or to manure to decrease the amount of odor <p>Food safety - Pork Quality Assurance</p> <ol style="list-style-type: none"> 1. Program designed to expose producers to proper production practices to improve management, reduce costs, ensure proper drug usage, and learn about food safety issues 2. Allows producers to develop an HACCP (Hazard Analysis Critical Control Points) program for their individual farms to identify potential problems in production practices that might reduce the quality of the pork produced 3. Animal welfare - The <i>Swine Care Handbook</i> contains information on management practices, proper facilities, environmental management within confinement buildings, nutrition, and health to help ensure that hogs receive humane care.
<p>Application</p> <p> AS 1 - Debate - Swine Production and the Environment</p>	<p>Answers to AS 1</p> <p>Answers will vary and student participation should be accounted for.</p>
<p>Closure/Summary</p>	<p>Some aspects of pork production are of concern to the American public, including pollution of the environment, the safety of pork, animal welfare, and animal rights. With the help of state and national pork producers associations, producers are working to address these issues.</p>

Evaluation: Quiz**Answers**

1. c
 2. c
 3. d
 4. a
 5. Maintaining a stable nutrient balance requires testing the soil for nutrient composition and testing the waste for nutrient content. These tests allow the producer to gauge how much liquid waste can be applied.
 6. Irrigation and injection
 7. Supporters of animal rights believe that animals should not be used as resources by humans. Animal welfare calls for the humane use of animals. Supporters of animal welfare believe that use of animals brings a responsibility to provide appropriate care to the animals.
 8. To identify potential problems in production practices that might reduce the quality of the pork produced
-

Debate – Swine Production and the Environment

Objective: To understand consumer concerns about large scale-commercial swine production.

Your class will be conducting a debate over whether your county should ban commercial swine production because of the fear of pollution from improperly handled waste. The instructor will assign you to a group to argue for or against the ban. Use any available resources to find information which supports your argument. Your research should take into account the views of both private and commercial swine producers as well as people not involved in swine production. It should answer the following questions.

- What local, state, and national regulations affect local swine producers?
- What is the economic impact of swine production locally?
- How many people would be directly affected if a ban occurred?
- What is the business structure of commercial operations?
- What environmental risks does swine production offer?
- Are there health risks to humans from swine production?
- What can producers do to protect the environment?

When you have completed researching your position, the instructor will moderate the debate.

EVALUATION

Circle the letter that corresponds to the best answer.

1. What is the purpose of the *Swine Care Handbook*?
 - a. To encourage producers to assess whether they are protecting the environment
 - b. To teach consumers how to adopt and care for swine
 - c. To ensure that hogs receive humane care from producers
 - d. To expose producers to proper production practices to improve pork quality

2. Which of the following waste storage structures is similar to a pond?
 - a. Pit
 - b. Slurry store
 - c. Lagoon
 - d. Lake

3. Which of the following is an aspect of animal welfare that concerns consumers?
 - a. Odor emission within confinement buildings
 - b. Pollution of groundwater and waterways
 - c. Right of animals to life
 - d. Amount of space given to each animal

4. What is the purpose of the Environmental Assurance Program?
 - a. To encourage producers to assess whether they are protecting the environment
 - b. To expose producers to proper production practices to improve pork quality
 - c. To ensure that hogs receive humane care from producers
 - d. To teach people how to ignore odor from animal wastes

Agricultural Science I

Curriculum Guide: *Introduction to Swine Production*

Unit Objective:

Students will demonstrate their knowledge of swine production by preparing a time line that shows what happens from conception to retail in the swine industry.

Show-Me Standards: 1.8, SC3

Reference:

Introduction to Swine Production. University of Missouri-Columbia, Instructional Materials Laboratory, 1997.

Students will use additional outside sources to complete this activity.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 7.
- Students will complete AS 5.2, Swine Antibiotics; AS 6.1, Ear Notching; and AS 7.1, Debate–Swine Production and the Environment.
- Additional activities that relate to the unit objective can be found under the heading “Other Activities” in the following locations: p. 59 and p. 73.

Performance-Based Assessment:

Students will be asked to construct a time line of a pig’s life from conception to retail (packaging). Students need to include any vaccinations given to the mother during pregnancy or the pig itself, any changes in feed as the pig matures, and management practices performed on the pig. In addition, students will include explanations or benefits of each management practice.

Students will be assessed on the presentation of the time line and the content and overall quality of the events and explanations.

Introduction to Swine Production Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Have students prepare a time line that shows the care and management practices in a pig's life from conception to retail.
 - a. Give the students the option of working individually or in pairs.
 - b. Students may use material in the unit but must use additional outside material to complete their time line.
 - c. Students may not use the source material word for word and must provide a complete bibliography of their sources along with their time line.
 - d. Students can create their time line on the computer or draw it by hand.
2. Students need to include any vaccinations given to the mother during pregnancy or the pig itself.
 - a. Vaccinations should be listed in the order they are given.
 - b. They also need to include any restrictions on the medication and withdrawal time that must be observed for harvesting.
3. The student must document any changes in feed rations as the pig matures. This may include, but is not limited to, the following:
 - Weight or amount of feed given
 - Protein percentages
 - Additives
4. Students must list management practices performed on the pig and at what age they are to be done.
 - a. Their time line should at least include the following:
 - Clipping of needle teeth
 - Docking of tails
 - Castration
 - Notching of ears
 - b. An explanation or benefit of each management practice should also be included. For example, clipping of needle teeth prevents damage to the sow's udder.
5. Students will be assessed on the presentation of the time line and the content and overall quality of the events and explanations.

**Introduction to Swine Production
Student Handout**

1. You will prepare a time line that shows the care and management practices in a pig's life from conception to retail.
 - a. Your instructor will decide if you work individually or in pairs.
 - b. You may use material in the unit but must use additional outside material to complete the time line.
 - c. You may not use the source material word for word and must provide a complete bibliography of the sources along with your time line.
 - d. You can create the time line on the computer or draw it by hand.

2. You will need to include any vaccinations given to the mother during pregnancy or the pig itself.
 - a. Vaccinations should be listed in the order they are given.
 - b. You will also need to include any restrictions on the medication and withdrawal time that must be observed for harvesting.

3. You must document any changes in feed rations as the pig matures. This may include, but is not limited to, the following:
 - Weight or amount of feed given
 - Protein percentages
 - Additives

4. You must list management practices performed on the pig and at what age they are to be done.
 - a. Your time line should at least include the following:
 - Clipping of needle teeth
 - Docking of tails
 - Castration
 - Notching of ears
 - b. You will need to include an explanation or benefit of each management practice. For example, clipping of needle teeth prevents damage to the sow's udder.

5. You will be assessed on the presentation of the time line and the content and overall quality of the events and explanations.

Agricultural Science I

Introduction to Swine Production Scoring Guide

Name _____

◆ Page 7 ◆

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Content of Explanations and Events	<input type="checkbox"/> Information is complete <input type="checkbox"/> Facts are accurate <input type="checkbox"/> Facts are in correct order <input type="checkbox"/> Well organized	0 criteria met	1 criterion met	2 criteria met	3 criteria met	All 4 criteria met	X 15	
Presentation of Time Line	<input type="checkbox"/> Well organized <input type="checkbox"/> Neat <input type="checkbox"/> Creative <input type="checkbox"/> Easy to follow	0 criteria met	1 criterion met	2 criteria met	3 criteria met	All 4 criteria met	X 7.5	
Technical Considerations for Explanations and Events	<input type="checkbox"/> Spelling <input type="checkbox"/> Grammar <input type="checkbox"/> Punctuation <input type="checkbox"/> Capitalization	0 criteria met	1 criterion met	2 criteria met	3 criteria met	All 4 criteria met	X 2.5	
TOTAL								

Final Assessment Total _____/100 pts.

Comments:

