

Animal Production

Level-III

Based on March 2018, Version 3 OS and June 2021, V1 Curriculum



Module Title: - Supporting Swine Production Activities

LG Code: AGR APR3 M06LO (1-6) LG (88-93)

TTLM Code: AGR APR3 TTLM0621v1

June, 2021



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LG #88

LO #1- Recognize swine production systems

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying and characterizing swine production systems.
- Selecting/ recommending suitable and feasible production system.

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Identify and characterize swine production systems.
- Select/ recommend suitable and feasible production system.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets”
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, ask your trainer for further instructions or go back to “Operation sheets”.



Information Sheet 1- Identifying and characterizing swine production systems

1.1. Introduction

There are basically 3 systems of swine production. The classification depends on the levels of inputs in raising the swine and therefore the system to be adopted depends on the capital available.

1.2. Systems of swine production

I. Backyard or Scavenging system

- The swine are completely left on their own to scavenge for food all the time. Usually the pigs are left to the compound of the owner and some form of supplementary feed either as family food leftovers or occasionally commercial swine feed is offered.
- Indigenous swine types are predominantly used because they are tolerant to low quality feeds and are resistant to some parasites such as ascaris.
- As might be expected, the growth rate and body condition of swine under the scavenging /backyard system of production are generally poor.
- The meat quality of the swine kept under this system is poor.
- It is difficult to control the spread of diseases under this system and there will be high piglet mortality caused by disease infections and other factors like malnutrition, predators, crushing, and chilling.

II. Semi-intensive system

- This is the system practiced under situations varying from backyard/scavenging conditions to conditions similar to that of an intensive system.
- Commercial feed is commonly used as kitchen leftovers are not sufficient to sustain the requirements of the swine.
- The swine are housed at night but are allowed to gaze out. Farmers are usually able to keep about 20-30 pigs under this system of management.
- If this system is well managed; the performance of the swine will be as well as those managed under intensive system.

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- It requires plenty of land and swine must be confined in fenced paddocks

III. Intensive -Large scale commercial system

Under this system,

- Swine are kept in total confinement
- Herd size ranges from 50 sows and more
- Commercial feed is used
- There must be good husbandry practices with respect to feeding, hygiene, disease control and housing
- The growth rate is fast., there is good feed conversion ratio, high sow reproductive efficiency and good quality carcass

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Self-check 1	Written test
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Directions: Answer all the questions listed below.

1. List the 3 types of swine production systems? (6 points)
2. In which system of production swine are kept in total confinement? (2 points)

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 2- Selecting/ recommending suitable and feasible production system

2.1. Introduction

The selection of suitable swine production system depends on farming objective, environmental condition, financial resource, market demand, welfare requirement and other factors.

2.2. Selection of production system

Several factors have caused a slight resurgence in the small-scale, pasture system of swine operations. These are:

- A niche market is developing in some areas based on concern for animal welfare and increased consumer interest in “all-natural” and “organic” pork. Locally raised organic or all-natural pork brings a premium in some markets.
- The high cost of confinement facilities provides a cost advantage for pasture production. The equipment for pasture production includes low-cost shelters or portable huts, watering systems, and feeders, most of which can be easily moved when rotating pastures.

Properly managed pasture systems are friendly to the environment and have better air quality than those of confinement operations. Producers do not have to worry about building air quality, and if the pastures are not overcrowded, manure disposal in pasture management is not a problem. Mud and erosion problems are avoided by raising hogs on sandy, well-drained soils and by rotating pastures. Disease incidence is usually much less in pasture-managed swine herds than with hogs in confinement production due to less contact and less crowding.

Pasture management can be used with all breeds and colors of swine. However, it is best to use the darker colored breeds (Duroc, Hampshire, etc.) or a crossbreed of swine. The darker breeds tend to be better equipped for changes in the environment, especially the intense and prolonged exposure to sunlight in pasture management

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Self-check 2	Written test
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Directions: Answer all the questions listed below.

1. List the factors considered to select suitable swine production system (5 points)
2. List the factors that have caused a slight resurgence in the small-scale, pasture system of swine operations (4 points)

Note: Satisfactory rating - 9 points

Unsatisfactory - below 9 points

You can ask you teacher for the copy of the correct answers.

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**LG #89****LO #2- Identify and select swine breeds and breeding****Instruction sheet**

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying and characterizing commercial and non-commercial breeds
- Setting criteria to selection
- Selecting specific breed
- Selecting breeding stock
- Facilitating natural and artificial breeding.
- Diagnosing pregnancy
- Caring pregnant sows

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify and characterize commercial and non-commercial breeds
- Set criteria to selection
- Select specific breed
- Select breeding stock
- Facilitate natural and artificial breeding.
- Diagnose pregnancy
- Care pregnant sows

Learning Instructions:

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Information Sheet 1- Identifying and characterizing commercial and non-commercial breeds

1.1. Introduction

It is the goal of the swine producer to raise breeding stock and market swine that have rapid, efficient growth. These hogs should also yield a high percent of muscle when slaughtered.

There are differences among breeds in the traits that are considered economically important. When selecting breeds to use in crossbreeding programs, consider litter size, growth rate, feed efficiency, carcass length, leanness, and muscle. When selecting individual animals, performance test records should be examined. In this information sheet the modern swine type is described

1.2. The characteristics of the breed

American Landrace

History

The Landrace breed originated in Denmark. In 1934, the first Landrace hogs were imported into the United States for experimental purposes by the U.S.

Description

Landrace hogs are white in color. They are long-bodied and their ears lop forward and down (Figure 1). Landrace sows are noted for their mothering ability (Figure 2). The breed is also known for its large litters.

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Figure 1 Landrace boar.



Figure 2 Landrace gilt.

Berkshire

History

The Berkshire originated in England in and around Berkshire and Wiltshire counties. The development of the breed began during the early and mid-1700s. The first importation of Berkshires into the United States occurred in 1823. Further importations occurred in 1857. All registered Berkshires in the United States trace their ancestry to the 1857 importations.

Description

The Berkshire (Figures 3 and 4) is a medium-sized hog that produces an acceptable carcass. The animal is black with six white points. Four white points are found on the feet. There is also some white on the face and the tail. The head is slightly dished and the ears are erect.

The American Berkshire Association was formed in 1875. Disqualifications for registration are swirls on the back or sides, large amounts of white hair on the body, or red hair. (A swirl is hair growing in a circular pattern from the roots. It usually occurs along the top of the spine. In many breeds it is a disqualification for registry because of the undesirable appearance it gives the animal. However, it does not affect any of the

economically important traits of market hogs.) Selection has placed emphasis on fast and efficient growth, meatiness, and good reproduction.



Figure 3 Berkshire boar.



Figure 4 Berkshire gilt.

Chester White

History

The Chester White (Figure 5) originated in Chester County, Pennsylvania. Additional development of the breed also occurred in Delaware County, Pennsylvania. The original name of the breed was Chester County White. Later the word *County* was dropped from the name.

Yorkshire, Lincolnshire, and Cheshire hogs, all of English origin, were mixed in breeding before 1815. An English white boar, which was called a Bedfordshire or Cumberland, was imported from England sometime between 1815 and 1818. This boar was used on the mixed breeding of the three English breeds mentioned earlier. From these matings, the Chester White breed originated. In 1848, the breed was named Chester County White.

Description

The color of the breed is white (Figure 6). The ears droop forward. The breed is noted for its mothering ability. Disqualifications for registry include swirls on the back and sides, or any color other than white.

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Several breed associations were formed in the early days of the development of Chester Whites. An effort to combine these associations began around 1911. The present association is the Chester White Swine Record, which was incorporated in 1930. The association headquarters is in Peoria, Illinois.



Figure 5 Chester White boar



Figure 6 Chester White gilt.

Duroc

History

The Duroc breed (Figure 7) originated from red hogs raised in the eastern United States before 1865. The New Jersey red hogs were called Jersey Reds. In New York, the red hogs were called Durocs. Some Red Berkshires from Connecticut are also thought to have been included in the early breeding. Intermingling of these breeds resulted in a breed called Duroc-Jersey. The name *Jersey* was later dropped and the breed became known simply as Duroc.

Description

The color of the Duroc is red (Figure 8). Shades vary from light to dark, with a medium cherry being the preferred shade. The Duroc has ears that droop forward. The breed has good mothering ability, growth rate, and feed conversion. It is one of the most popular breeds of hogs in the United States. Disqualifications for registry include having more than three black spots, black spots larger than 2 inches in diameter, cryptorchidism (retention of one or both testicles in the body cavity), fewer than six

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functional teats on each side of the underline, or white hair on the body (with the exception of white on the end of the nose).

The American Duroc-Jersey Record Association was formed in 1883. Several other associations were later formed to register red hogs. These associations merged to form the United Duroc Swine Registry in 1934. Headquarters of the breed association is located in Peoria, Illinois.



Figure 7 Duroc boar.



Figure 8 Duroc gilt.

Hampshire

History

The Hampshire breed originated in England. Importations of Hampshires were made into the United States between 1825 and 1835. Major development of the breed occurred in Kentucky, where the belted hogs were known as the Th in Rind.

Description

The Hampshire is black with a white belt that encircles the forepart of the body (Figure 9). The forelegs are included in the white belt. To be eligible for registry, the white belt must include no more than two-thirds of the length of the body. White is permitted on the hind legs as long as it does not go above the bottom of the ham or touches the white belt (Figure 10). The Hampshire has erect ears. The breed is noted for its

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rustling, muscle and carcass leanness. It is a popular breed and is used in many crossbreeding programs.



Figure 9 Hampshire boar



Figure 10 Hampshire gilt.

Hereford

History

The Hereford breed was developed in Missouri, Iowa, and Nebraska. Early development of the breed occurred from 1902 to 1925. Foundation stock used in the development of the breed included Duroc and Poland China. Chester White and Hampshire hogs may also have been included in the early breeding.

Description

Herefords are red with a white face (Figure 11). The ears are forward drooping. To be eligible for registry, Hereford hogs must be at least two-thirds red and have some white on the face. Herefords are prolific, good mothers, and have good rustling ability (Figure 12). Disqualifications for registry include no white on the face, less than two-thirds of the body is red, swirls on the body, or less than two white feet.

The National Hereford Hog Registry Association was organized in 1934. Hogs from Iowa and Nebraska were selected as foundation stock for original registry. Headquarters for the breed association is in Flandreau, South Dakota



Figure 11 Hereford boar.



Figure 12 Hereford gilt.

Poland China

History

The Poland China breed (Figure 13) originated in the Ohio counties of Butler and Warren. The breed was developed between 1800 and 1850. Russian, Byfield, Big China, Berkshire, and Irish Grazer bloodlines were used in the development of the breed. It is generally believed that no new bloodlines were used in the breeding after 1846.

The breed was originally called the Warren County hog. The name Poland China was officially adopted at the National Swine Breeders Convention in 1872.

Description

The Poland China hog is black with six white points (Figure 14). The white points include the feet, face, and the tip of the tail. The Poland China has forward-drooping ears. Poland Chinas are one of the larger breeds of hogs. These hogs produce carcasses with low back fat and large loin eyes. They are used in many crossbreeding programs.

Disqualifications for registry include less than six teats on each side of the underline, hernia, cryptorchidism, or evidence of a belt formation. The absence of any of the white points is not objectionable nor is an occasional splash of white on the body. The breed association is the Poland China Record Association, which is located in Peoria, Illinois.

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Figure 13 Poland China boar



Figure 14 Poland China gilt

Spotted Swine

History

The Spotted Swine breed (Figures 15 and 16) was developed in Indiana. It was created by crossing hogs of Poland China breeding with spotted hogs being grown in the area. Later crosses were made with hogs from England called Gloucester Old Spots.

Description

Spotted Swine are black and white. At least 20 percent of the body must be either black or white to make the animal eligible for registry. In body type, Spotted Swine breed is similar to the Poland China, and also has forward drooping ears. Breeders strive to produce a large-framed hog with efficient gains and good muscling.

The breed association was formed in 1914. At that time, only one recorded parent was necessary for registering an individual hog. The herd book was closed in 1921. The original name of the breed was the Spotted Poland China. The name was changed to Spotted Swine, or Spots, in 1960. The herd book was opened to register purebred Poland Chinas in 1971. This was to provide a broader genetic base. The herd book was closed again in 1975. (Closing the herd book means that only animals whose parents are registered in the herd book may be registered.) The breed association is the National Spotted Swine Record and is located in Peoria, Illinois.

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Disqualifications for registry include brown or sandy spots, and swirls on any part of the body. Cryptorchids (males with one or both testicles retained) are also disqualified.



Figure 15 Spotted Swine boar.



Figure 16 Spotted Swine gilt.

Yorkshire

History

The Yorkshire hog (Figure 17) originated in England in the county of Yorkshire, where the breed was called Large White. Importations were made into the United States in the 1800s. At that time, many of the hogs were raised in Minnesota, where they became known as Yorkshires.

Description

The color of the Yorkshire is white (Figure 18). The skin sometimes has black pigmented spots called *freckles*. Hogs with black spots can be registered, but this trait is considered undesirable. The ears are erect and the face slightly dished. The Yorkshire was one of the early bacon-type breeds of hogs.

Yorkshires have large litters, high feed efficiency, rapid growth, good mothering ability, and long carcasses. They are often used in crossbreeding programs.



Figure 17 Yorkshire boar.



Figure 18 Yorkshire gilt.



Self-check 1	Written test
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Directions: Answer all the questions listed below.

- 1. List the goal of the swine producer in the selection of breeds (4 points)
- 2. Compare and contrast American landrace and Yorkshire breeds? (10 points)

Note: Satisfactory rating - 14 points Unsatisfactory - below 14 points

You can ask your teacher for the copy of the correct answers.



Information Sheet 2- Setting criteria to select swine breed

2.1. Definition

A breeding program can be defined as the set of activities and decisions undertaken by a breeder (producer) towards improving animal performance for a given trait.

2.2. Breed selection objectives

Any criteria set for breed selection of swine should be implemented to achieve a certain clearly defined objective. Therefore, the first step in a breed selection is to define realistic and attainable objectives.

The main objective of setting breed selection criteria is to select a breed which maximize meat output per unit input. The quality of animal products must target the requirements of the end-user or target market. This may be an export or domestic market.

The quantity of meat produced depends on the number and weight of surplus animals at age of sale. The importance of reproduction rate must be stressed in relation to the number of meat animals for sale. The market may require lean meat or a fat that would be a delicacy in some cases and there may be specific flavor requirements in some areas.

To ensure genetic improvement for a particular trait, the available variation in the current population and the heritability of the trait should be known. The selection intensity should be determined to achieve the target within the time limit envisaged.

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Self-check 2	Written test
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Directions: Answer all the questions listed below.

- 1. Define breeding program? (2 points)
- 2. what is the main objective of setting breed selection criteria? (4 points)

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 3- Selecting specific breed

3.1. Introduction

The selection of specific breed depends on the production objective of an enterprise. Therefore, you must consider the availability and environmental adaptability of a breed in the local area.

3.2. Breed selection

There is a large variation among swine breeds. Different breeds have different environmental adaptability. Animals which are adapted to cool areas may not be suitable to hot areas. Animals which have evolved within a certain area are usually better adapted to that particular area than other breeds. Therefore, whenever possible, it would be wise to make use of such animals in improvement programs. In such programs, productivity improvement should come through selection and better management. Introduction of other breeds may be considered if their own – or that of their crosses with local breeds – adaptability to the area is proven and if their performance shows clear superiority to local animals under similar management conditions.

Selection among breeds must be based on performance data collected from groups raised in the same environment (cohorts). Comparisons need to be made in the actual environment in which animals will be raised, not on experimental stations. Comparisons must be thorough to give realistic estimates of not only lifetime production but also reproductive, mortality and morbidity rates.

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Self-check 3	Written test
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Directions: Answer all the questions listed below.

- 1. What is the enterprise depends to select breeds? (2 points)
- 2. what is considered to select specific breed? (4 points)

Note: Satisfactory rating - 6 points Unsatisfactory - below 6 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 4- Selecting breeding stock

4.1. Introduction

There has been a major change in the type of market hog in demand today. Consumers want more lean meat and less fat in their pork. Producers can raise the kind of pork the market demands by using modern production technology and improved breeding programs.

Purebred breeders pay careful attention to genetics when selecting bloodlines. Research shows that there are differences among various swine genotypes in their ability to efficiently produce the lean pork the current market demands. The kind of environment and the health management techniques used by the producer also influence the rate and efficiency of lean growth in market hogs.

Good quality, leaner, more heavily muscled hogs bring a premium price in the market

4.2. Selection of breeding stock

Animals to be used for breeding purposes should be selected carefully and superior animals should be identified accurately. Swine can be selected based on records of performance and visual appraisal. Selection based on records is the best way to achieve good results. Additional visual appraisal of the selected animals is advantageous. Visual appraisal of a contemporary group of animals may be considered where record keeping is not practical or is nonexistent. Visual identification of superior animals is less successful compared to selection based on records. Differences among animals of the same age from similar dams (parity, age, condition) kept under similar management serve as indicators of genetic variability that can be exploited in a breeding program.

4.2.1. Visual appraisal

Selection of swine for breeding purposes based on visual observation is done by looking at the appearance, conformation and presence or absence of defects in the animal.

Reproductive soundness-Reproductive and skeletal soundness are priorities in the selection of breeding hogs. Boars should have two functional testicles. Females should

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have fully developed vulvas and functional underlines (the outline of the underbody) with a minimum of six teats and preferably seven teats per side.

Skeletal soundness -Most hogs are raised indoors on concrete floors. They must be skeletally sound to survive, grow, and reproduce in confinement. Hogs need to have proper skeletal angulation; the legs should be straight and set at the proper angle from the body (see Figure 19). Hogs should also be able to move with ease.

Growth/potential production-Breeding animals are selected for fast growth and high production. Producers should note the age of the animal when it reaches 230 pounds, referred to as “days to 230”; fewer days are more desirable. Breeding gilts should be selected from large litters of pigs, because a sow that can raise a large litter has mothering ability, which is a desired trait. They must also have an acceptable body capacity. A large body capacity allows animals to consume greater amounts of feed

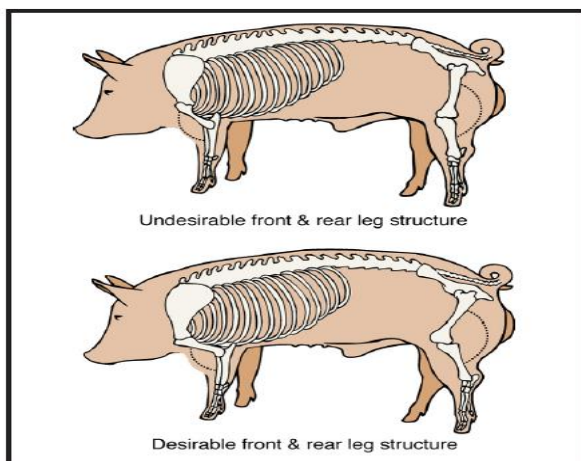


Figure 19 Skeletal soundness

Frame size - A large frame size is important in producing lean animals at high weights. Large-framed animals remain leaner at heavier weights than do small-framed animals.

Leanness/muscling -To produce lean and heavily muscled market hogs, breeding animals must share these traits. Breeding stock should be leaner and more muscular



than average. Producers should use ultrasound to look at backfat and loin eye area, which are the best indicators of leanness and muscularity. Adjusted backfat scans at 240 pounds should be between .6 and 1.1 inches, while loin eye areas should be more than six square inches.

4.2.2. Performance records

Wherever possible, selection of animals should be based on records of performance. Performance records are even more important for breeding schemes which involve the selection of superior animals from among a group. It is often necessary to keep simple record on pedigrees such as sire and dam, so that the performance of parents can be related to that of their offspring. This is essential for selection schemes. For crossbreeding, recording the breeds involved might be sufficient unless there is an additional requirement to avoid future inbreeding because of a small number of animals or a small geographic area.

Self-check 4	Written test		
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Directions: Answer all the questions listed below.

1. Explain the visual appraisal method of swine selection (9 points)
2. Discuss performance records (5 points)

Note: Satisfactory rating - 14 points

Unsatisfactory - below 14 points

You can ask you teacher for the copy of the correct answers.

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Information Sheet 5- Facilitating natural and artificial breeding.

5.1. Introduction

Breeding is an essential phase of swine production. There is no defined 'breeding season' in the domestic pig. Gilts reach puberty around 6 to 8 months of age and post-pubertal females generally exhibit estrus every 21 days. After weaning, sows usually return to estrus within 5 to 7 days. Intensive management systems generally set annual goals of approximately 2.5 litters per sow. Elements comprise the breeding process are:

- genetics,
- timing, and
- natural or artificial mating.

5.2. Genetics

Genetic selection varies among producers but important criteria are:

- reproductive traits (e.g., number of pigs born, number of pigs weaned, litter weights, etc.)
- performance traits (e.g., growth rate, feed efficiency, backfat, etc.), and
- the heritability of these traits.

Most, if not all, commercial production in the U.S. utilizes a crossbred female bred to a purebred boar.

5.3. Timing

The timing of mating is critical for optimal fertilization, to reduce the incidence of nonproductive sows, and to maintain production/movement schedules. Sows and gilts are often induced to farrow at a specific time to facilitate a narrow range between piglet ages within a farrowing group.

5.4. Natural mating

There are two types of natural mating in swine production:

- pen mating and
- hand mating.

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Pen mating, where one or more boars is placed with a group of sows, is frequently used in pasture systems. This approach requires less labor for the producer but provides little information about when, or if, a sow is bred, making it difficult to predict farrowing times.

Hand mating involves placing one boar with one sow and observing to make sure mating occurs. This is commonly used in controlled-environment facilities as well as outdoor facilities that have a boar on site. This method requires more labor and time but provides very accurate information upon which to base future management decisions.

5.5. Artificial insemination

Artificial insemination (AI) does not require a boar on site; rather semen is obtained from a boar stud. For biosecurity reasons, semen is either delivered to the farm by a private courier or a farm employee picks it up at a designated collection site. Semen is often transported interstate from boar stud to breeding/ gestation facility. The only adult male pigs on the breeding/gestation farm are a minimal number of sterile males (vasectomized or epididymized) used to stimulate the females and verify pregnancy in bred females.

AI requires the highest level of management expertise and labor of all the mating systems. Insemination of the sow or gilt begins by stimulating the animal with adjacent boars. Once the sow/ gilt is stimulated, an insemination rod is inserted into the cervix and semen is deposited. This mating process takes about 2 to 5 minutes per female.

AI has become the predominate method of breeding swine on U.S. farms of all sizes, especially in controlled environment facilities where breeding efficiency is a major factor affecting production. This method enables more rapid genetic advancement than natural options while minimizing the risk of disease transmission.

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Self-check 5	Written test
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Directions: Answer all the questions listed below.

- 1. List the elements comprise the breeding process in sow (3 points)
- 2. What are the two types of natural mating in swine production? (2 points)
- 3. Discuss natural mating and artificial insemination (6 points)

Note: Satisfactory rating - 11 points Unsatisfactory - below 11 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 6- Diagnosing pregnancy

6.1. Introduction

Non-pregnant, non-lactating females decrease the reproductive efficiency of swine operations. They generate production costs and occupy space in breeding and gestation facilities, yet they do not participate actively in the production of piglets. As a result, producers invest time and money with essentially no opportunity for return each day that these females remain in the herd.

The most common reason for keeping non-pregnant, non-lactating females in swine operations is the failure to identify sows and gilts that do not conceive soon after breeding. Consequently, the development and implementation of effective pregnancy diagnostic procedures is an important component of an efficient reproductive management program. This information sheet provides objective information concerning several methods used for pregnancy diagnosis in swine.

6.2. Techniques used for pregnancy diagnosis in swine

A brief summary of the key points associated with each of the techniques is outlined in Table 1.

Table 1 Techniques for pregnancy diagnosis

Technique	Physiological Basis	Period of Effective	Accuracy
Detection of estrus	Non-pregnant females exhibit estrus	Any time during gestation	> 98%
A-mode ultrasound	Identification of fluid in pregnant uterus via speed at which emitted sounds return to probe	Days 28 to 80 of gestation	> 95%
Doppler ultrasound	Identification of sound patterns of increased blood flow in uterine and umbilical arteries during pregnancy	After day 29 of gestation	> 95%
Real-time ultrasound	Visualization of fluid and fetal tissue in pregnant uterus	After day 21 of gestation	> 95%
Progesterone concentrations	Increased blood progesterone concentrations (>5.0ng/ml) in pregnant females	Days 17 to 20 of gestation	>85%
Prostaglandin-F _{2α} concentrations	Increased blood prostaglandin concentrations in non-pregnant females (>200pg/ml)	Days 13 to 15 of gestation	> 80%
Estrone sulfate concentrations	Increased estrone sulfate concentrations in pregnant females (> 0.5 ng/ml)	Days 25 to 30 or after day 80 of gestation	> 93%



Self-check 6	Written test
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Directions: Answer all the questions listed below.

1. Discuss the importance of PD? (2 points)
2. Mention the techniques of PD? (12 points)

Note: Satisfactory rating - 14 points Unsatisfactory - below 14 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 7- Caring pregnant sows

7.1. Introduction

Pregnant sows are one of the basic units in swine production and therefore should be looked after very well. Sows that are efficient in reproduction make profitable pig herd. Feed adequate quantities of well-balanced diet to sows for maximum production and delivery of healthy piglets.

7.2. Management of pregnant sows

- The gestation period of a sow varies from 109 to 120 days, with an average of 114 days.
- Ensure good health by maintaining proper hygiene and administering multivitamins and deworming
- A pregnant Sow must not travel long distance.
- Avoid excessive feeding which makes them too fat. Fat pigs experience difficulties during farrowing
- Pregnant animals should be housed in groups in separate enclosures and should not be mixed with new animals to avoid fighting, which at times may result in abortion. Do not keep more than 10 sows in a pen
- It would also be advisable to house pregnant gilts and sows in separate groups during gestation.
- About 3m² of dry draft-free housing should be available for each sow.
- The pregnant animals should be allowed to move about every day in the morning on a free range or a pasture, if available.
- A pasture area is presumed to be clean if a cultivated crop was raised since pigs were last kept on it. It is advisable to limit the size of pastures to one area.

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Self-check 7	Written test
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Directions: Answer all the questions listed below.

- 1. What is the length of gestation period of sow? (2 points)
- 2. List the management practices of pregnant sow (10 points)

Note: Satisfactory rating - 12 points Unsatisfactory - below 12 points

You can ask you teacher for the copy of the correct answers.

**Procedures:**

1. Wipe the vulva with a dry paper towel to clean away any dirt that may contaminate the head of the catheter.
2. Apply pressure to sow's back.
3. Insert catheter into the vulva.
4. Angle the catheter up approximately 45° to avoid the bladder.
5. Insert catheter further into the reproductive tract until a firm resistance is felt.
6. Pull the catheter slightly back to lock catheter into the sow's cervix.
7. Allow semen to be drawn in, or squeeze in very slowly (allow 2-3 minutes).
8. Bind or hold the catheter to prevent flow-back of semen.
9. Leave the catheter in the sow for another 5 minutes to continue cervical stimulation, maintain uterine contractions, and maximize semen uptake.
10. Remove catheter slowly.



LAP Test	Practical demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 3 minutes.

1. Performing AI in gilt/sow



LG #90

LO #3- Plan for swine house construction and facilities

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Recognizing rules of thumb to select site for construction
- Selecting proper site for house construction
- Determining space requirement
- Designing the house and farm layout
- Identifying and specifying materials and facilities

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Recognize rules of thumb to select site for construction
- Select proper site for house construction
- Determine space requirement
- Design the house and farm layout
- Identify and specify materials and facilities

Learning Instructions:



1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.



Information Sheet 1- Recognizing rules of thumb to select site for construction

1.1. Introduction

Site Selection: The process encompasses many steps from planning to construction, including initial inventory, assessment, alternative analysis, detailed design, and construction procedures and services. Site selection includes the housing, basic services (e.g., water, fuel, sewage, etc.), access infrastructure (e.g., roads, paths, bridges, etc.) and social and economic structures commonly used by site residents (e.g., schools, clinics, markets, transport facilities, etc.).

1.2. Site selection factors

There are numerous factors to consider in selecting a site for the construction of housing and related infrastructure. Some of these are:

1.2.1. Capacity

The number of pigs and people at a new site should not result in resource requirements that unsustainably exploit locally available natural resources, because this is likely to result in lack of access to vital resources in the future (e.g., over pumping of groundwater). As a rule of thumb, the per capita resource requirements of a new site will be as high as existed before the construction, and may be higher if new housing, infrastructure (e.g., water, sewage), or livelihoods are introduced as part of the construction process.

1.2.2. Climate

Most new shelter sites will be in the same climatic zone as was the pre-construction site. However, new shelter sites should consider the impact of potential future changes in climate, such as the need for increased drainage because of future increased rainfall), and incorporate features to enhance local climate conditions.

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1.2.3. Slope

Sloping land is very important for proper drainage, piped water, and sewage systems. However, it is preferred that new shelter sites be located on land with a slope of no more than 5%. Where this is not possible, a combination of terraces, vegetation, and appropriately designed drainage systems should be installed to limit erosion. Steep slopes are also subject to landslides and slumping and should be avoided measures to control these processes are very expensive and of limited reliability.

1.2.4. Vegetation

As much of the natural vegetation should be retained at a site as is possible

The use of nonnative plants that have the potential to invade agricultural and wildland areas should be avoided

1.2.5. Construction methods and materials

- Construction methods minimize negative environmental impacts.
- Building designs reduce energy requirements for heating or cooling.
- Construction methods rely on locally available skills and competencies, and consider the need to introduce new methods to reduce disaster risk or increase sustainability.
- Methods to reduce disaster impact are incorporated into site and building design.
- The use of locally available materials for construction does not place unsustainable demands on the local supplies of these materials.

1.2.6. Drainage

- The drainage plan is based on projected maximum daily precipitation as well as consideration of future climate impacts.
- Raised areas that can provide safety from possible floods have been established for humans, their possessions, and domestic animals.
- The permeability (i.e., ability of the soil to absorb water) of the site is maximized to reduce runoff.
- Unpaved areas are established to reduce flooding and to increase soil absorption of water.

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- Warning systems are established for potential flood events

1.2.7. Wind

- Wind directions, including seasonal variations, have been plotted for the site.
- Roads and building direction consider prevailing winds to provide good ventilation for the site.
- Doors and windows are positioned to limit the impact of winds considered unpleasant.
- Roads are designed to break the flow of the wind.
- In areas of potentially high winds (from thunderstorms, monsoon fronts, etc.) or heavy snow, roof slopes are 1:4 unless other structural measures are taken to limit the potential for wind or snow damage.

1.2.8. Sun

- The sun track across the site has been plotted.
- Buildings are oriented to limit or promote solar heating as needed.
- Building design incorporates the need for shade to offset roof heating
- Options for solar water heaters have been investigated and heaters used where appropriate

1.2.9. Topography

- The establishment is designed to match the existing topography; the location and orientation of roads, housing blocks, and community structures have been adjusted to fit the form of the land.
- Discussions on the disadvantage of a block-grid approach to site selection have taken place, and alternatives developed as financially and socially feasible.

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Self-check 1	Written test
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Directions: Answer all the questions listed below.

1. Define site selection? (2 points)
2. explain the factors considered in site selection (18 points)

Note: Satisfactory rating - 20 points Unsatisfactory - below 20 points

You can ask you teacher for the copy of the correct answers



Information Sheet 2- Selecting proper site for house construction

Due consideration should be given to the following points in site selection for a swine farm.

- Drainage: The area should be slightly sloped for effective drainage.
- Wind direction: Animal houses should be partially or totally protected from the direction of strong winds
- depending on the wind intensity of the area.
- Climatic factors: Such as temperature and rainfall.
- Topography
- Availability of feed and water
- Market
- Roads



Self-check 2	Written test
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Directions: Answer all the questions listed below.

- 1. Define site? (2 points)
- 2. List down the factors to consider? (9 points)

Note: Satisfactory rating - 11 points Unsatisfactory - below 11 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 3- Determining space requirement

The space requirement of pigs listed below

Table 2. Floor space requirements for different classes of sows

Sl. No.	Category of pigs	Roofed/covered area (m ²)	Open yard (m ²)
1	Boar	6.0-7.5	8.8-12.0
2	Farrowing sow	7.5-9.0	8.8-12
3	Weaner/fattening pigs	0.9-1.8	0.9-1.2
4	Dry sow/gilt	1.8-27	

Table 3 Watering and feeding space requirements.

Sl. No	Particulars	Adult pig	Growing pig
1	Length of manger/pig (cm)	60-75	3-4
2.	Length of water trough/pig (cm)	6-8	3-4
3.	Width of manger and water trough (cm)	50	30
4.	Depth of manger and water trough (cm)	20	15
5.	Height of manger and water trough (cm)	25	20



Self-check 3	Written test
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Directions: Answer all the questions listed below.

- 1. List the space requirement of pig? (8 points)
- 2. List the feeding and watering requirement of pigs? (10 points)

Note: Satisfactory rating - 18 points Unsatisfactory - below 18 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 4- Designing the house and farm layout

4.1. Layout plans for sty

Swine buildings apart from providing protection against inclement weather should also provide proper hygienic conditions required to maintain the healthy growth of pigs. A sort of semi-indoor system of swine farming in loose houses is generally suitable in this country. However, it may be necessary to modify structural designs and/or change construction materials under an expert opinion suiting local conditions, especially at places where extreme climatic conditions prevail. Sheds for pigs are known as sties. There shall be sties to house pigs of different ages separately. Dimensions of the sties and dimensions of managers and water tanks in adult and young pig sties shall be as specified.

Flooring

It should be made of cement and concrete with grooves to prevent slipping. Provide enough slope from one end to the other for easy drainage (about 3 cm for every 2-meter length). Provide enough shade by planting trees.

Floor should be made of conventional masonry type with cement mortar. Proper drains be provided for disposal of effluents.

Boar sty

The boars should be housed in individual stalls. A row of stalls can be grouped under one roof. The number of stalls depends on the number of breeding boars kept on the piggery. Normally one boar per 10 breed able female in a boar sty normally 24 pens under one roof is allowed

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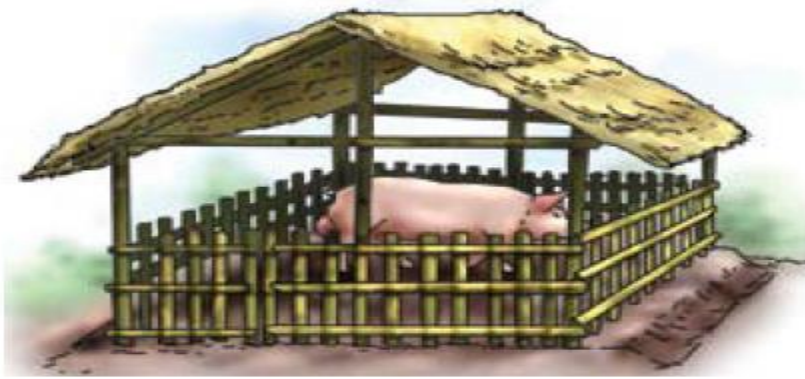


Figure xx. Boar sty

Gilt sty and dry sow sty

On smaller farms dry sows and gilts can be housed together. On larger farms there shall be two different sites for dry sows and gilts. These are simple loose houses in which the floor shall be cement-paved in the covered area and brick-lined in the open area. These sties shall be in a row. Three to ten pigs should be housed in each sty depending on stage of pregnancy. Each sty shall normally have not more than 40 pens under one roof and these pens shall be arranged in two rows



Figure 20. Farrowing sty

Pregnant sows are transferred to these sties 7-10 days before the expected date of farrowing and left here up to weaning of their litters (56 days). Each farrowing sty shall normally contain no more than 40 pens under one roof and each pen shall accommodate not more than one animal with the litter. Number of farrowing pen required is 10 % of the breed able female. Floor space allowance is 9 squares meter both in pen and run each pen should have the facilities of guard rail and creep area



Figure 21. Guard rail

The guard rails are made up of tubular iron rod of 2 to 2.5 inches thickness and fixed 25 to 30cm away from the wall and above the floor. So that the piglets can run under the rail when the sow lies down so that the crushing of piglets can be avoided in between the sow and walls.

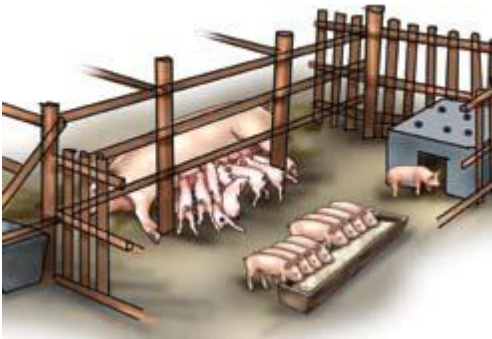


Figure 22. Creep area

In corner of the pen creep area should be provided with the help of stone slab should be fitted in the corner of the pen, 25-30cm above the floor level. In that area piglet only can enter and get the creep feed. Lighting can also provide in creep area to give warmth to young ones. Since piglets having thin layer of subcutaneous fat it is more susceptible to cold stress.

Bedding

For good results 4 to 6" bedding is needed especially in winter and at first 3 days after farrowing to give warmth, softness and non-slippery floor. It must be kept clean dry and

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evenly distributed. Wallowing tank should not be provided in the farrowing pen in order to avoid trampling of piglets in to the wallowing tank.

Weaner sty

Piglets that are weaned are housed in these pens up to six months of age. Each sty shall normally, have not more than 30 pens under one roof. Each pen may accommodate 30 piglets of age group between two to six months. Number of weaner/grower sty is equal to the number for breed able female in the farm. 0.9 to 1.8 square meter per animal under pen and run

Fattening sty

These are for housing pigs that are being transferred for the market. Each fattening sty shall normally have not more than 20 pens under one roof and each pen may have 16 to 32 animals kept for fattening purpose.

4.2. Accessory items

Apart from the building for the stock, a few subsidiary buildings like weighing yards, loading and unloading ramp, stores garbage boiling vats, wallowing tank etc. are also required on swine farms.

Simple weighing yard for pigs: This is the place where pigs are periodically collected and weighed. The details of store are more or less the same as described under cattle housing.

There shall be a permanent ramp, on swine farms for loading and unloading pigs into and out of automobiles. There shall also be a boiler room in which provisions are made for boiling garbage (before feeding to pigs) in big vessels or in jacketed vats with fore or steam generated in a boiler. There shall be one or two manure pits situated at least 15 m away from sties.

Hog wallows: Pig needs a wallow during summer because they have relatively few sweat glands. It is water pool where hogs enter into water and cool their body in summer. It is specially needed for fattening and breeding animals. *Location:* In a shady place. Proper location in relation to sties is important so that during treatment the hogs should not have access to any shallow pools or muddy holes which they usually prefer.

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Types of wallows: A masonry wallow made of concrete and cement with proper drainage system be made. Mud wallow is not at all desirable for it causes unsanitary conditions. *Size of wallow:* It depends upon size and number of animals. It is an advantageous to have large wallow enough to accommodate entire herd at one time. A wallow of 3 meters length, 2 meters width and 45 cm. Depth will easily hold a herd of 20 hogs of various ages. Where sprinklers are used one nozzle per 25 to 30 hogs is sufficient.

Construction: The top of the side and end walls of wallows should extend at least 10 cm above the surface of ground to prevent surface water running into wallow. The entrance and exit incline must have a gradual and easy slope so that hogs may enter and leave wallow conveniently. To prevent slipping, the concrete floor of incline must be roughened with a broom soon after it is laid and grooves made in it with a bar.

Medicated wallows: It is used for medicating or disinfection purposes. The instinctive habit of the hog to wallow in water when weather is warm can be advantageously used in treatment for external parasites and diseases caused by them (mange, scabies, and hog louse). Proper depth of liquid in wallow depends upon size and number of hogs. An 8 to 10 cm liquid will give better results than greater depth. Wallow should not be kept medicated continuously as disinfectant may cause irritation with the result hogs may refuse to enter the wallow. It should be drained, cleaned and recharged with water only. Disinfectant may be added every week or 10 days until desired results are obtained.

Precautions: Hogs are likely to drink from wallows unless water is rendered denatured by distasteful substance. For this crude oil and petroleum products are most suitable dips because of distasteful nature and tendency to spread over surface of the body. Crude oil as disinfectant may use at 1 pt per each hog. The oil floating on surface also prevents evaporation of water.

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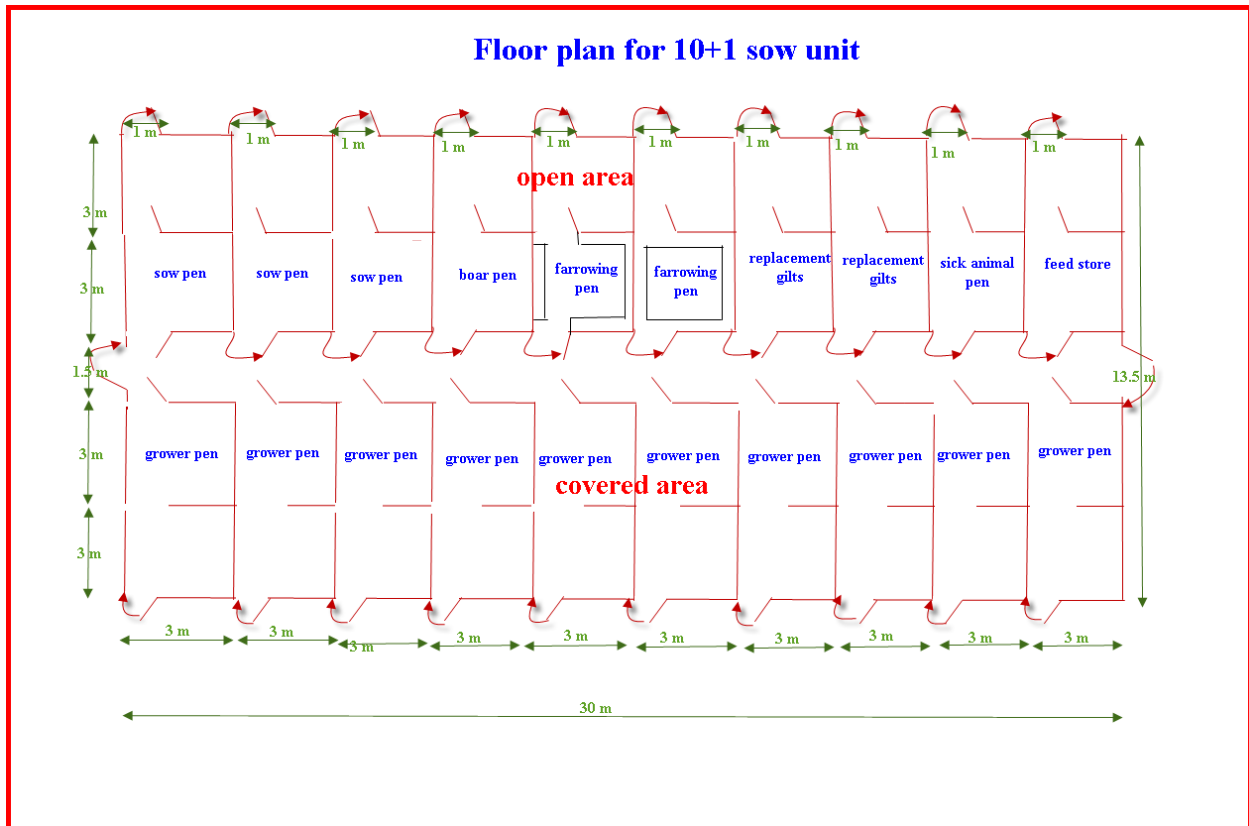


Figure 23. Floor plan for 10+1 sow unit

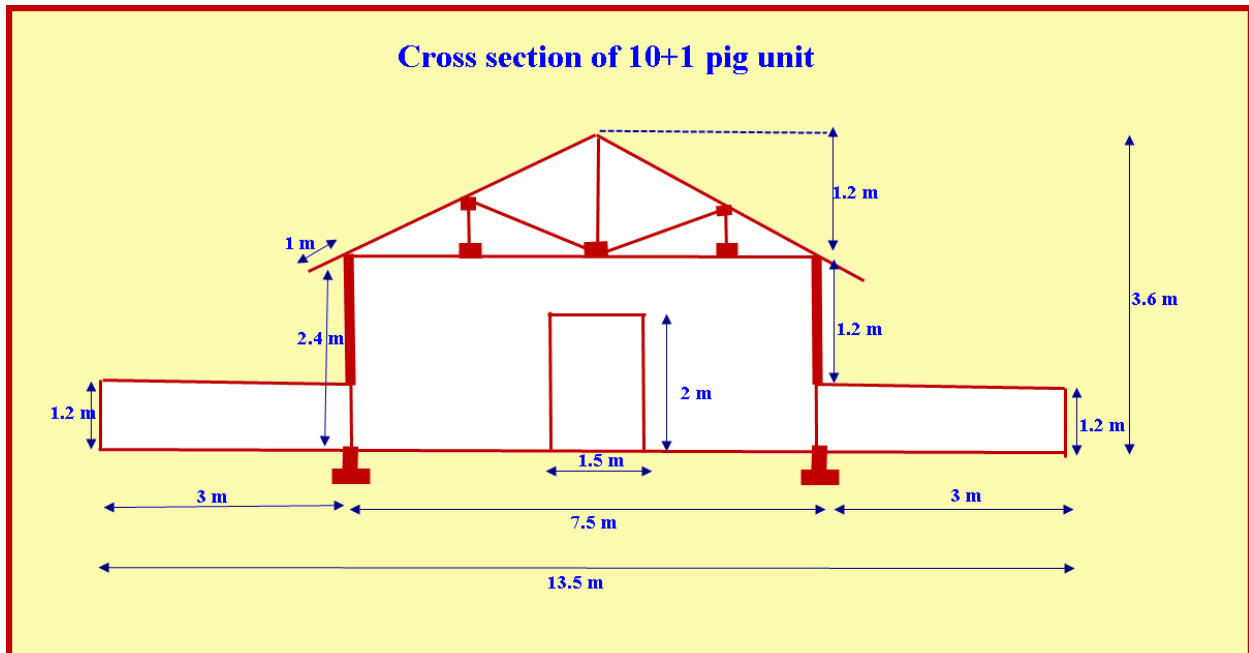


Figure 24. Cross section for 10+1 sow unit

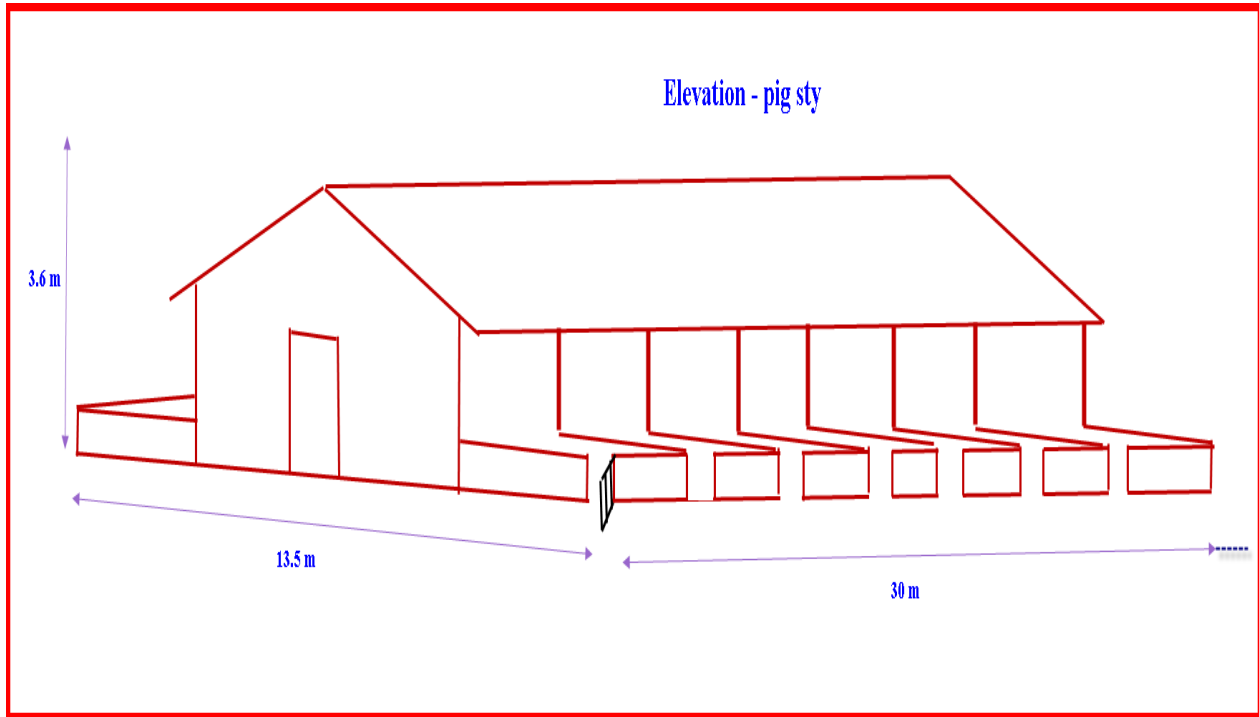


Figure 25. Elevation of a swine sty



Self-check 4	Written test
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Directions: Answer all the questions listed below.

- 1. Discuss layout of swine farm (10 points)
- 2. List down the accessory items swine farm (6 points)

Note: Satisfactory rating - 16 points Unsatisfactory - below 16 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 5- Identifying and specifying materials and facilities

5.1. Introduction

wide range of building materials is available for the construction of buildings and structures. The proper selection of materials to be used in a particular building or structure can influence the original cost, maintenance, ease of cleaning, durability and, of course, appearance.

Several factors need to be considered when choosing the materials for a construction job, including:

1. Type and function of the building or structure and the specific characteristics required of the materials used, i.e. great strength, water resistance, wear resistance, attractive appearance, etc.
2. Economic aspects of the building/structure in terms of original investment and annual cost of maintenance.
3. Availability of materials in the area.
4. Availability of the skilled labour required to install some types of material.
5. Quality and durability of different types of material.
6. Transportation costs.
7. Selection of materials with compatible properties, dimensions and means of installation.
8. Cultural acceptability or personal preference.

5.2 Construction materials

Example : Wood characteristics:

- *Strength* in wood is its ability to resist breaking when it is used in beams and columns.
- *Hardness* is the resistance to denting and wear
- *Woods that are stiff* resist deflection or bending when loaded.
- *Tough woods* will deflect considerably before breaking.
- *Nail-holding resistance* for hardwoods is greater than for softer woods.

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- *The workability*, such as sawing, shaping and nailing, is better for soft, low-density woods than for hardwoods, but usually they cannot be given a high polish.
- *Natural-decay resistance* is particularly important in the warm, humid regions

Gravel, sand for blinding, concrete, bricks, mortar, plaster, cement plaster, Wooden posts, gum-poles, corrugated steel sheets, nails, frame-timber, wire, cement, gravel, stone etc

5.3 Swine facilities

Components of organized swine farm:

- Boar sty
- Weaning pig sty
- Farrowing pen
- Sick animal sty
- Dry sow and gilt sty

Ancillary facilities are

- Wallowing tank
- Loading ramp
- Holding area
- Manure pit
- Feed store
- Dipping tank
- Crush for vaccination and treatment

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Self-check 5	Written test
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Directions: Answer all the questions listed below.

- 1. List factors need to be considered when choosing the materials for a construction job (8 points)
- 2. List ancillary facilities (7 points)

Note: Satisfactory rating - 15 points Unsatisfactory - below 15 points

You can ask you teacher for the copy of the correct answers.



Operation Sheet 1	Preparing estimate cost of swine building
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Procedures:

- 1. Determine the number of livestock to be accommodated
- 2. Determine the dimension of the building
- 3. Inventory locally available materials at hand
- 4. Conduct market assessment on cost of variable inputs
- 5. Prepare bill of quantity



LAP Test	Practical demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 5 hours.

1. Prepare estimate cost of swine building



LG #91

LO #4- Formulate ration for swine

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying swine nutritional requirements
- Identifying the nutritional value of available feedstuffs
- Making decisions concerning dietary elements.
- Selecting, checking, and maintaining tools and equipment
- Identifying ingredients
- Identifying ingredients measurement ratios and quantities.
- Doing milling where necessary.
- Blending ingredients adequately and hygienically

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify swine nutritional requirements
- Identify the nutritional value of available feedstuffs
- Make decisions concerning dietary elements.
- Select, check, and maintain tools and equipment
- Identify ingredients
- Identify ingredients measurement ratios and quantities.
- Do milling where necessary.
- Blend ingredients adequately and hygienically

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.



5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, ask your trainer for further instructions or go back to “Operation sheets”.

Information Sheet 1- Identifying swine nutritional requirements

1.1. Introduction

Different stages of growth, production and reproduction have different nutrient requirements. To be profitable in swine production these different dietary requirements need to be met as inexpensively as possible. Maintenance requirements, growth requirements and production requirements are very important

1.2. Nutritional requirement of swine

Table 3 Nutritional requirement of swine

Nutrients	Pig starter/ Creep feed	Pig growth meal	Pig finishing/ Breeding meal
CP (%)	20 (17.80)	18 (16.00)	16 (14.20)
ME (Kcal/kg)	3360 (2990)	3170 (2821)	3170 (2821)
Ca (%)	0.6 (0.53)	0.6 (0.53)	0.6 (0.53)
Available P (%)	0.6 (0.53)	0.4 (0.36)	0.5 (0.45)
CF (%)	5.0 (4.45)	6.0 (5.34)	8.0 (7.12)



Note: All values are based on moisture free basis (100 % DMB), while values in parenthesis are converted to 89 % DMB (as fed basis)



Self-check 1	Written test
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Directions: Answer all the questions listed below.

- 1. What is the CP of creep feed? (2 points)
- 2. What is the ME of breeding meal? (2 points)

Note: Satisfactory rating - 4 points Unsatisfactory - below 4 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 2- Identifying the nutritional value of available feedstuffs

Most natural feedstuffs contain more than one nutrient. A knowledge of feedstuffs locally available to the farmer or swine feed producer is therefore most useful. The list of ingredients and their nutrient composition is shown in Table 4.

Table 4. Nutrient composition of commonly used feed stuffs

Feed stuff	Percentage (%)					
	Dry matter	Crude protein	Crude fiber	Calcium	Phosphorus	Metabolizable Energy (Kcal/Kg)
Maize	88	8.0	12	0.17	0.55	3,000
Maize bran	88	9.4	13	0.04	1.03	2,200
Rice bran	88	13.5	6.5	0.06	1.43	3,000
Cassava	88	2.8	4.0	0.30	0.05	3,000
Molasses	75	3.0	-	0.75	0.08	2,330
Millet	88	10.5	2.0	0.05	0.40	1,392
Sorghum	88	9.0	2.1	0.08	0.20	3,250
Fish meal	88	60.0	1.0	0.40	2.53	2,310
Blood meal	88	80.0	1.0	0.20	0.22	1,177
Cotton seed cake	88	40.0	14	0.53	1.20	968
Soya bean meal	88	43.0	6	32.00	0.64	2,800
Bone ash	89	-	-	35.00	18	-
Lake shell	98	-	-	-	-	-



Self-check 2	Written test
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Directions: Answer all the questions listed below.

1. What is the nutritional composition of maize? (5 points)
2. What is the nutritional composition of cotton seed cake? (5 points)

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 3- Making decisions concerning dietary elements

Swine feed shall comply with compositional and nutritive requirements as stipulated in Table 5.

Table 5: Compositional and nutritive requirements for swine feed

1	2	3	4
Characteristic / Nutrient	Pig starter/Creep, feed	Pig growth meal	Pig finishing/breeding meal
Moisture content, (% m/m), max	11	11	11
Crude fibre, (% m/m), max	5	6	8
Crude fat, (% m/m)	2	2	2
Crude protein, (% m/m), min	20	18	16
Total ash, (% m/m), max	8	8	8
Acid insoluble ash (% m/m), max	4	4	4
Metabolizable energy (Kcal/Kg), min	3600	3170	3170
Calcium (Ca)*, (% m/m), min	0.6	0.6	0.6
Available phosphorus (P) *, (% m/m), min	0.6	0.4	0.5
Copper (Cu) *, mg/Kg, min	8	6	6
Iron (Fe) *, mg/Kg, min	100	90	80
Manganese (Mn)*, mg/Kg, min	30	30	20
Zinc (Zn) *, mg/Kg, min	50	50	50
Chlorine, mg/Kg, min	900	900	800
Niacin, mg/Kg	17	14	10



Pantothenic acid, mg/Kg	11	10	10
Riboflavin, mg/Kg	3.0	2.4	2.2
Vitamin B ₁₂ activity, µg/Kg	15	11	11
Vitamin A, IU/Kg	1700	1300	1300
Vitamin D, IU/Kg	190	180	130
Note: For elements marked with * , the values specified are on moisture free-basis			



Self-check 3	Written test
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Directions: Answer all the questions listed below.

1. List the minimum level of CP required for each type of swine feeds (6 points)
2. List the minimum level of ME required for each type of swine feeds (6 poin)

Note: Satisfactory rating - 12 points Unsatisfactory - below 12 points

You can ask you teacher for the copy of the correct answers.

Information Sheet 4- Selecting, checking, and maintaining tools and equipment

4.1. Types of tools and equipment

- **Grinder**
 - ✓ Grinding or particle-size reduction is a major function of feed manufacturing
- **Mixers**
 - ✓ to obtain homogeneous mixtures,
 - ✓ appropriate for the range of weights and volumes required
- **Weighing equipment**
 - ✓ appropriate for the weights and volumes to be used
 - ✓ Accuracy of the weighing equipment should be compatible

4.2. Maintenance of tools and equipment

- disassembled
- calibration methods and frequencies
 - ✓ comply with manufacturers' recommendations
- Equipments coating, painting, lubricating and etc
 - ✓ not contribute to unacceptable contamination of feed

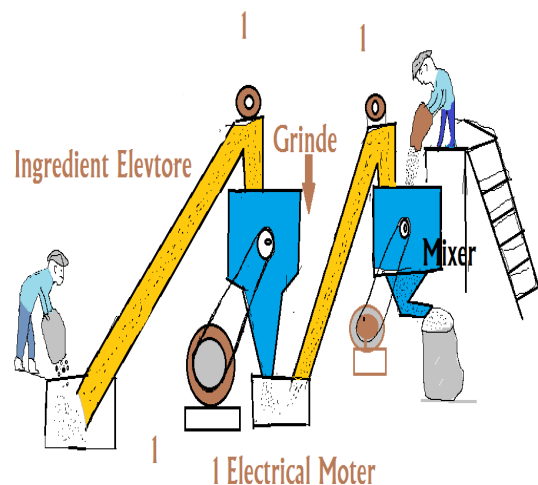


Figure 26 . Feed mixer

Figure 27. Feed grinder and mixer



Figure 28. Digital weighing scale



Self-check 4	Written test
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Directions: Answer all the questions listed below.

- 1. Mention the use of mixer? (4 points)
- 2. List the tools and equipment used for feed preparation? (6 points)

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 5- Identifying ingredients

5.1. Introduction

To prepare a feed with the quality mentioned above, any of the following ingredients can be used based on local availability and price.

5.2. Energy rich concentrates

1. Grains and seeds

Grains are seeds from cereal plants, and members of the grass family. Cereal grains are essentially carbohydrates. The main component of the dry matter (80-90%) is starch (rich in energy). The crude protein (CP) content varies between 8-12%, very low in lysine and methionine (essential amino acids). Low in CF, vitamin A & D, and Ca, but P level is high. Maize is most popular and palatable grain for all kinds of livestock. It contains about 65% starches, about 10% proteins, but deficient in tryptophan, methionine and lysine.

2. Cereal by-products

a) Flour: Soft, finely ground meal, of the grains which contains about 16% protein.

b) Meal: Feed ingredient of which the particle size is larger than flour, e.g. corn or oat meal contains protein 9-18% .

c) Bran: Outer coarse coat (pericarp) of grain separated during processing. E.g. rice bran, maize bran, wheat bran. Protein content is about 8-18%.

d) Middling: A by-product of flour milling industry comprising several grades of granular particles consisting of varying proportions of bran, endosperm and germ, each of which contains different percentages of crude fiber. The product has 15-20% CP and 4-8% CF. Deficient in calcium, carotene and vitamin D. During processing grains are separated into three parts: 82% of endosperm (starch), 15% of coat (bran), and 3% of germ.

e) Germ: The embryo of any feed.

5.2. Protein rich concentrates

Ingredients that contain more than 18% of their total weight in CP are generally classified as protein feeds. Protein supplements may be further categorical according to

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source of origin as plant proteins, animal proteins (avian, mammalian and marine), non-protein nitrogen, and single-cell proteins.

1. Plant proteins

i) Oilseed meals: A number of oil-bearing seeds are grown for vegetable oils for human food. In processing these seeds, protein rich products of great value as livestock feeds (oilseed meals) are obtained. The by-products left after extraction of oil seeds are used for feeding of all kinds of livestock.

a) Linseed meal: The meal is produced from flax seeds and the oil being a drying one used in paints, linoleum and soft soap. The cake is satisfactory for all classes of livestock except for poultry where if fed in more than 5%, it has a depressing effect on the growth.

b) Cotton seed cake: An excellent high protein feed (40 %) for ruminants but low in cystine, methionine and lysine. The cake can be used in pig and poultry rations if the free gossypol does not exceed 0.03%. The free gossypol content of cotton seed meal decreased during processing. It is toxic (to make animal infertile).

c) Soybean oil meal: The meal has the highest nutritive value of any plant protein source. The protein contains all the indispensable amino acids, but the concentrations of cystine and methionine are optimal. Soybeans have number of toxic, stimulatory and inhibitory substances. But these substances can be inactivated by proper heat treatment during processing. e.g. 110 °c for 3 minutes.

ii) Brewer's grains and yeast: Dried brewer's grains contain 25-29% CP, 19%CF. Dried yeast contains 42% CP. Rich in vitamin B complex, P.

2. Animal proteins

a) Meat meal: It is obtained, in slaughter house, from mammal tissue exclusive of hair, hoof, horn, stomach contents and hide trimmings by proper drying and grinding to which no other matter has been added. It is rich in CP- 50-55% but low in methionine and tryptophan. The product is normally used for swine and poultry.

b) Meat and bone meal: The product is similar to meat meal except it contains more bone, and consequently is higher in calcium and phosphorus and lower in protein (about 40%). It is primarily used in rations of swine and poultry.

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c) Blood meal: The meal is prepared by passing live steam through the blood until the temperature reaches 100°C. The treatment causes sterilization and the blood gets clotted. It is then drained, pressed to express occluded serum, dried by steam heating and ground. The meal is unpalatable and its use has resulted in reduced growth rates in poultry and it is not recommended for young stock.

d) Fishmeal: Fishmeal consists of fish or fish by-products that have been dried and ground into a meal. The protein content of fishmeal is usually around 60% with a digestibility of 93-95%. For pigs and poultry fishmeal is added to about 10% of the ration to make up for deficiencies of essential amino acids.

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Self-check 5	Written test
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Directions: Answer all the questions listed below.

- 1. list energy rich concentrates? (10points)
- 2. List down protein rich concentrate? (10 points)

Note: Satisfactory rating - 20 points Unsatisfactory - below 20 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 6- Identifying ingredients measurement ratios and quantities.

Feed ingredients should be weighed when:

- purchased,
- mixed with other feeds and
- sold as finished product

Failure to do so(weigh) makes it impossible to produce feed according to formula specifications

- Accuracy for scales should be .25% of capacity (i.e. 100 kg scale that weighs to the nearest .25 kg).
- If using micro ingredients (e.g. trace mineral sources or feed additives), the accuracy should be .10%.

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Self-check 6	Written test
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Directions: Answer all the questions listed below.

- 1. When should be weigh feed ingredients? (6 points)
- 2. What is the failure not to weigh feed ingredient accurately? (4 points)

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 7- Doing milling where necessary

Milling/grinding

- Grinding or particle-size reduction is a major function of feed manufacturing.
- Many feed mills pass all incoming ingredients through a grinder for several reasons:
 - ✓ clumps and large fragments are reduced in size,
 - ✓ some moisture is removed due to aeration, and
 - ✓ additives such as antioxidants may be blended.

All of these improve the ease of handling ingredients and their storability

The grinding of ingredients generally improves;

- mixing properties
- pellet ability
- increases the bulk density of some ingredients
- reduce storage space requirements and freight costs.
- feed digestibility, by increasing surface area;
- acceptability;
- **Hammer mill**

Feed particles are reduced by impact with rapidly rotating steel bars (referred to as hammers).

Screens with holes of different diameters can be used to make larger or smaller particles.

Hammer mills can process a variety of feeds including grains, oilseed cakes and even roughages like straw

Creation of fines (dust and particles smaller than desired) can be a problem

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Self-check 7	Written test
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Directions: Answer all the questions listed below.

- 1. What is a major function of feed manufacturing? (2 points)
- 2. What are improved through grinding of ingredients? (12 points)
- 3. Discuss about hammer mill (6 points)

Note: Satisfactory rating - 20 points Unsatisfactory - below 20 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 8- Blending ingredients adequately and hygienically

Very expensive modern machinery is available to mill and mix feeds.

Unless very large quantities of feed must be mixed, hand mixing is quite effective if certain principles are adhered to.

The equipment required must include a scale, shovels or spades and a floor large enough to do the mixing on. Although a well-packed earth floor can serve, a cement or concrete mixing floor is better.

Evenly mixing is very important. This is best achieved by the following procedure:

- The major constituent of the mixture is spread on the floor. The other constituents are then spread in layers over this first layer until all the components have been added. Shovels or spades are then used to mix the ingredients, much as concrete mixing is done.
- The people doing the mixing start at the edge of the layered ingredients and, using spades or shovels, turn the feed over with a mixing motion and move the mixed feed to one side, while at the same time heaping it.
- The mound of feed is then moved while continuing the mixing motion.
- Moving the mound back and forth is repeated two or three times, after which the feeds are usually well mixed.
- Where very small quantities of an ingredient must be evenly distributed in a feed e.g. ionophores, making a premix has been shown to make it possible to distribute the relevant ingredient very evenly throughout the mix.
- Making a premix involves taking a small amount, say a bucket full, of one of the ingredients of the diet (maize meal is usually taken, even if it is not one of the ingredients of the mixture) and the additive mixed well into this bucket full of meal.
- When all the other ingredients have been spread in layers on the mixing floor, the premix is carefully sprinkled over the top, while taking care that all the feed is covered with the premix (almost like spreading salt over a plate of food). Mixing proceeds as described above.

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Ingredients must always be weighed out on a scale that has been checked for accuracy. Mistakes with feed mixing are usually caused by the addition of incorrect quantities of one or more ingredients.

Care must be taken to ensure that all the ingredients are added and that they are added once only.

Swine feeds can be in the form of pellets, cubes, crumbs or meal.

The feeds must be free from rancidity, musty odour, harmful constituents such as dust, metallic pieces, adulterants, insect infestation and visible fungus growth.

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Self-check 8	Written test
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Directions: Answer all the questions listed below.

1. List the equipments used for hand mixing of feed? (4 points)
2. Explain the procedures for hand mixing of feed? (14 points)

Note: Satisfactory rating - 18 points

Unsatisfactory - below 18 points

You can ask you teacher for the copy of the correct answers.

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Operation Sheet 1	Mixing feed
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Procedures:

1. Wear personal protective cloth
2. Identify materials, tools and equipment used for determining
3. Identify ingredients used in ration formulation
4. Consult feed composition table to know the nutrient content of selected feed
5. Consult feeding standard tables to check the nutrient requirement of dairy animals
6. Calculate the ratio and amount of ingredients used for ration formulation and grinded them at recommended sieve size
7. Blended the crushed ingredient thoroughly by using Mixer
8. Add minerals, vitamins and other additives in the ration
9. Pack and store the formulated ration
10. Offer the ration for the group it is formulated according to feeding schedule



LAP Test	Practical demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 10 hours.

1. Mixing feed



LG #92

LO #5- Manage different classes of swine growing environment

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying and recognizing management activities
- Preparing and providing feed and water
- Cleaning equipment, swine' house and its environment
- Carrying out swine" health care activities
- Carrying out Piglet rearing activities
- Monitoring environmental parameters
- Monitoring and adjusting hygiene procedures.
- Monitoring disposal of waste and debris
- Monitoring feeds correct diet

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify and recognize management activities
- Prepare and provide feed and water
- Clean equipment, swine' house and its environment
- Carry out swine" health care activities
- Carry out Piglet rearing activities
- Monitor environmental parameters
- Monitor and adjust hygiene procedures.
- Monitor disposal of waste and debris
- Monitor feeds correct diet

Learning Instructions:

10. Read the specific objectives of this Learning Guide.

11. Follow the instructions described below.

12. Read the information written in the "Information Sheets". Try to understand what are



being discussed. Ask your trainer for assistance if you have hard time understanding them.

13. Accomplish the “Self-checks” which are placed following all information sheets.

14. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

15. If you earned a satisfactory evaluation proceed to “Operation sheets

16. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,

17. If your performance is satisfactory proceed to the next learning guide,

18. If your performance is unsatisfactory, ask your trainer for further instructions or go back to “Operation sheets”.

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Information Sheet 1- Identifying and recognizing management activities

• Management of gilt

Age to breed gilts:

1. Best age recommended for breeding is 8 months (at least 2nd or 3rd heat) weighing about 100-110 kg.
2. A difference of about 2 piglets is obtained if gilts are bred on the third heat

Health Management:

1. All arriving or newly purchased gilts should be quarantined (separated) from the rest for at least two weeks to check diseases and acclimatize the animal in the new farm
2. Deworm the gilt 7-14 days before breeding
3. Treat against external parasites 14 and 7 days before breeding
4. Inject with vitamin (ADE) once before breeding
5. Vaccinate with Hog Cholera, FMD and others at 6-8 months of age

Feeding management:

- ✓ Avoid the gilts from becoming too fat. Follow recommended feeding guide
- ✓ About 10-14 before the gilts are served, increase the feed ration to 3.0-3.5 kg./day (flushing). This aims to increase the number of egg cells to be fertilized.

• Management of the pregnant sow

- ✓ Monitor closely the gilt at 3 weeks (18-24 days) after breeding and again at 6 weeks (38-44 days) after breeding. If the gilt does not come in-heat, we can assume that it is pregnant
- ✓ Gestation period (pregnancy) of pigs is 114 days (average)
- ✓ Avoid stress, rough handling, fighting and disturbances to the pregnant sow especially within the first 3-4 weeks of pregnancy. Stress could cause death of embryos resulting in few number of piglets.

Feeding management of the pregnant sow:

- ✓ Feed the sow with brood sow or breeding feeds

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- ✓ Don't over-feed or under feed the sow. Feed 2 kg. of feeds daily. Increase this to 2.5-3.0 kg. per day one month before farrowing (85-110 days). Reduce the feeds to 2.0 kg. three days before farrowing (111-113 days). On the day of farrowing (114 days), the sow usually has no appetite to eat so don't give feeds or give just a handful to keep her quiet. This will help the sow to have easy farrowing.
- ✓ Feed roughage or green feeds like grasses, camote, sayote leaves and other vegetables.
- ✓ Clean, fresh water should be available at all times.

Health Management:

- ✓ Bath the sow especially during hot weather. High temperature is also a stressor.
- ✓ Fourteen (14) and (7) days before farrowing, treat the sow against mange especially if the gilt or sow has been treated before breeding. Wash and scrub first the animal before
- ✓ treating
- ✓ Deworm the sow 7-14 days before farrowing. Use broad spectrum dewormer
- ✓ Antibiotic supplement may be added to the drinking water or feed 3-10 days before farrowing and 5—10 days after farrowing. This is to protect the sow from farrowing stress

Preparations for farrowing:

If using a separate farrowing pen or house, place the sow one week before farrowing. This will allow sufficient time for sow to adjust and be relaxed at farrowing time

Clean and disinfect the farrowing pen/house including the feeding and watering trough at least 7 days before transferring the sow

3. Before being moved to the farrowing pen/house, the sow should be thoroughly bathed and scrubbed with soap and water especially at the sides and udder. This is done to remove the parasite eggs and bacteria.

4. If possible, the pens should be provided with piglet protection facilities like hurdles or guard rails to prevent crushing.

5. Check the pens for presence of sharp edges or protruding part or anything that might hurt the sow or piglets

6. Check the lighting and brooding facilities

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7. Clean the udder of the sow with clean cloth soaked in warm water a few hours before farrowing

Signs of farrowing:

1. Building its nest, pushing slightly of hurdles, guard rails, walls, flooring
2. Restlessness, uneasiness, biting of hurdles and guard rails
3. Sow is always in “sitting dog” position
4. Enlarged and distended udder. Pink, shiny and pointing outside direction
5. Teats produces milk (farrowing in 12-24 hours) but not always
6. Small round size manure of sow and frequent urination
7. Swollen vulva, mucus discharge and meconium (first feces of piglets). Red and loosen.
8. Signs of labor like muscular spasms, deep and fast breathing Duration of farrowing is 30 mins. to 6 hours and an average of 2.5 hours interval between piglets should not be longer than 15 minutes.
10. Placenta comes off partially during farrowing but the rest comes out 30 mins. after birth of all Piglets
11. Piglet interval of 45 minutes with restlessness, and excessive straining is sign of difficult farrowing where assistance is needed.
12. With difficult farrowing, check the condition of the sow before injecting with oxytocin. Giving more oxytocin without checking the sow if problem exists will do more harm. After 10 minutes of injection, and no piglet comes out, help the sow thru “dukot system” of piglet.

Other management:

1. Vaccinate the piglets and sow with Hog Cholera at 30-35 days, 42 days for FMD
2. Wean the piglets at 30-42 days depending on health and condition of the piglets
3. Deworm the piglets at 42-45 days old

- **Management of the dry sow (dry period):**

Dry period is the time interval from weaning to service. The sow is unproductive (dry). A good sow should come back to heat within 3-7 days after weaning

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1. Always keep the sow in good health and condition especially during the lactation period.
2. Keep the lactation period not longer than six (6) weeks (42 days)
3. Do not feed the sow on the days of weaning. This will stress the animal for an early occurrence of heat.

After weaning, increase the feed to 3.5-4.0 kg. per day (flushing) until service

5. Expose weaned sows to the boar. Place the sow pen near the boar.
6. Mixing the sow with other dry sows in a pen also influences heat
7. If sows do not come into heat after 10 days, hormonal injection could be given
8. Old sows which farrowed 8x and above tend to have longer dry periods
9. Keep sows as cool as possible during summer to avoid heat stress
10. Check dry sows for heat occurrence twice a day during feeding time

Signs of heat:

1. Swelling and reddening of the vulva
2. Appearance of mucus discharge from the vulva
3. Grunting and restlessness
4. Mounting her pen mates (if group)
5. Frequent attempts to urinate with little or no discharge especially in the presence of a boar
6. Assumes a stationary attitude (mating stance) when touched
7. Cocks her ears, becomes rigid in every limb, and may quiver at her haunches
8. Stands firm in one place and resist attempts to move her away cannot be herded the ordinary way (standing heat)

Management of weaners, growers, & fatteners (fattening period)

(Weaner-a piglet that has been separated from its mother to become fully mature)

(Grower- pigs from 30-60 kg. or about 3-5 months old)

(Fattener-pigs from 60-90 Kg or about 5-6 months)

Considerations in Purchasing :

1. Purchase piglets that had been weaned from its mother for at least 1-2 weeks.
2. If possible, purchase piglets from one source or farm
3. Purchase piglets that are of high quality and healthy

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- **Management during transport of weaners and growers:**

1. Add vitamins and electrolytes or anti-stress medications to the drinking water least two days before transport and continued 3-5 days after arrival
2. Transport the pigs during the coldest part of the day. The vehicle should be well ventilated and protected against direct sunlight
3. The pigs should not be handled roughly. Place beddings of straw or grasses at the flooring of the vehicle to protect the legs and feet of the animals
4. Do not mix big and small animals
5. Do not fully feed the pigs during transport. Drinking water should be given during long trips



Self-check 1	✓ Written test
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Directions: Answer all the questions listed below.

- 1. Describe the sign of heat? (10 points)
- 2. Describe the sign of farrowing? (10 points)

Note: Satisfactory rating - 20 points Unsatisfactory - below 20 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 2- Preparing and providing feed and water

2.1. Preparation of water

Water is one of the most important nutrients in hog rations. Hogs should have plenty of water available at all times. The water should be prepared and provided fresh, clean, and no colder than 45°F (7°C). It should be checked periodically for nitrate content. Too much nitrate or nitrite in the water is not good for hogs.

The estimated daily consumption of water by various classes of hogs that are not undergoing stress is as follows (Table 5):

Table 5. Daily water consumption of swine

Description	Gallons/Day
Pigs	
25 lb	0.5
60 lb	1.5
100 lb	1.75
200 lb	2.5
300 lb	3.5
Gestating sows	4.5
Sow plus litter	6.0
Nonpregnant gilts	3.2
Pregnant gilts	5.5

2.2. Preparation of feeds

Generally, grains used in hog feeding should be ground for most efficient use. Corn, barley, grain sorghum (milo), and oats should be finely ground. Wheat should be coarsely ground.

Pelleting complete feeds improves feed efficiency. Some of this improvement probably results from the lower feed waste that comes from pelleting. Higher fiber rations are also improved by pelleting. Pelleting results in 4 to 8 percent improvement in rate of gain per ton of feed.

Liquid or paste feeding reduces feed waste. Rate of gain may increase, but labor costs are generally higher with this method of feeding. There is an advantage in wetting



complete mixed feeds when limit-feeding hogs. Mix 1.5 parts of water with 1 part of dry feed for best results.

There is no advantage to cooking, soaking, or fermenting most feeds for hogs when they are full fed. The only exceptions are soybeans and potatoes, which are improved by cooking. Heating corn does not affect its nutritive value.

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Self-check 2	Written test
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Directions: Answer all the questions listed below.

- 1. Describe the daily water consumption of swine? (9 points)
- 2. Which form of feed improves efficiency? (2 points)
- 3. List the feed requires cooking for swine feeding (4 points)

Note: Satisfactory rating - 15 points Unsatisfactory - below 15 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 3- Cleaning equipment, swine' house and its environment

3.1. introduction

Cleaning is the process of removing unwanted substances, such as dirt, infectious agents and other impurities, from an object or environment. Cleaning occurs in many different contexts. And uses many different methods

3.2. Methods

Cleaning is broadly achieved through mechanical action and/or solvent action, many methods rely on both processes.

Washing, usually with water and often some kind of soap or detergent

- ✓ Pressure washing, using a high-pressure steam of water
- ✓ Wet cleaning, methods of professional; laundering that avoid the use of chemical solvents

Abrasive blasting, typically used to remove bulk material from a surface, may be used to remove contaminants as well

Acoustic cleaning, the use of sound waves to shake particulates loose from surfaces

Dry cleaning of clothing and textiles, using a chemical solvent other than water

Flame cleaning of structural steel, with oxyacetylene flame

Ultraviolet germicidal irradiation, which destroys microorganisms; used extensively in the medical and food industries etc.

3.3. Sanitization program

The first step in a sanitation program is keeping the swine facilities clean.

- High pressure water cleaning equipment is useful in removing dirt and manure from the hog house.
- After cleaning with high-pressure water, the facilities should be given a good scrubbing with soapy water.
- Use of a good disinfectant completes the process. A hot lye solution is an effective disinfectant. Lye solutions kill most germs and viruses.

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Pens for young pigs should receive the most attention when facilities are cleaned and disinfected. Clean pens are also important for older pigs. However, older pigs are not as susceptible to diseases as are young pigs. Proper ventilation and light improve sanitation in the hog house. Bacteria and viruses grow better in dark, damp, poorly ventilated areas. Concrete floors make the cleaning job easier.

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Self-check 3	Written test
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Directions: Answer all the questions listed below.

1. Define cleaning (2 points)
2. Explain the methods of cleaning (12 points)
3. What is the first step in sanitization program of swine? (2points)

Note: Satisfactory rating - 16 points Unsatisfactory - below 16 points

You can ask you teacher for the copy of the correct answers.

Information Sheet 4- Carrying out swine” health care activities

Biosecurity means:

- establishing the health/disease status of the herd;
- improving where necessary and maintaining a good animal health status within the herd by avoiding introduction of the disease;
- good management/husbandry;
- good hygiene;
- reducing stress in the herd; and
- effective disease control systems such as vaccination and worming programmes.

Biosecurity results in:

- farm units being more secure from the introduction of new infectious diseases; and
- the spread of any diseases on the unit itself being kept to a minimum.

A written health and welfare plan should also be in place and as a minimum, include:

- biosecurity arrangements on farm and during transport;
- purchased stock procedures;
- specific disease programmes, such as salmonella, erysipelas, E. coli,
- mycoplasma and parvo virus;

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- vaccination policy and timing;
- isolation procedures;
- mixing and grouping of pigs;
- external and internal parasite control;
- lameness monitoring and foot care;
- routine procedures, such as ear tagging;
- prevention and control of vices such as tail biting;
- monitoring and recording of mortality and culling rates and the reason for culling;
- monitoring and recording of medicines usage; and
- animal health incident records.

The health and welfare plan should ensure that pigs get any necessary medical treatments at the correct time and in the correct dose and, using the correct injection techniques.

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Self-check 4	Written test
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Directions: Answer all the questions listed below.

1. Discuss biosecurity? (10 points)
2. discuss health and welfare plan? (15 points)

Note: Satisfactory rating - 25 points

Unsatisfactory - below 25 points

You can ask you teacher for the copy of the correct answers.

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Information Sheet 5- Carrying out Piglet rearing activities

5.1. Meaning of piglet

Piglet: A pig up to the time it is weaned from the sow.

5.2. Piglet rearing

The important management practices are performed in the period between farrowing and weaning of piglet:

- A few minutes after the birth the umbilical cord may be pulled gently away or cut if necessary (2.5 – 3.8 cm length). After birth, the navel of each piglet should be soaked in a cup of iodine solution to prevent inflammation and tetanus.
- The mucus must be wiped off and the pigs placed under the heat lamp. Baby pigs must be kept warm and dry
- Colostrums should be taken by all the piglets on the same day they are born.
- After the first one or two days, the digestive system of the piglets breaks down the colostrum and its ability to protect from diseases is lost.
- The piglets can be given additional feed of goat or cow's milk, or a mashed bean porridge to which a little sugar has been added. If the milk produced by the sow is too little to meet the needs of the piglets
- For newborn pigs, temperature should be 85°F to 95°F (29°C to 35°C) under the heat lamp. Heat lamps are placed 18 inches (45.7 cm) above the pigs. After 4 or 5 days, the temperature is lowered to 70°F to 80°F (21.1°C to 26.7°C) by raising the heat lamp.
- Needle teeth should be clipped with disinfected clippers. The needle teeth of pigs less than 2 days old should be clipped at the gum line.
- Pigs can be ear notched for identification.
- Tail docking is cutting off the pig's tail 1/4 to 1/2 inch (0.6 to 1.3 cm) from the body. This should be done when the pigs are 1 to 3 days old.
- Anemia is prevented by giving iron injections or oral doses of iron. This should be done when the pigs are 2 to 4 days old.
- Male pigs that are raised for slaughter must be castrated to avoid boar taint.

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- Castration is best done when the pigs are young. There is less stress on the pigs and the job is easier. Boars should be castrated before they are 2 weeks old.
- Creep feeding: Young piglets from 7 days onwards should have high protein feed available to them

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Self-check 5	Written test
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Directions: Answer all the questions listed below.

- 1. Define meaning piglet? (2 points)
- 2. Discuss the management practices from farrowing to weaning of piglet? (18 points)

Note: Satisfactory rating - 20 points Unsatisfactory - below 20 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 6- Monitoring environmental parameters

6.1. Introduction

Hog houses must be well ventilated. A ventilation system has several functions. Ventilation helps to remove from the house the extra moisture that is present in large amounts, especially in the winter. Odors are also removed by ventilation.

Hogs are healthier when they have fresh air. A ventilation system helps to provide the necessary fresh air. The ventilation system also dilutes airborne disease organisms that are present in the hog house. The amount of ventilation needed for each of these functions varies. If enough ventilation is provided for fresh air and temperature control, the other functions are generally served.

The amount of ventilation required varies with the season. More air movement is needed in the summer than is needed in the winter. Winter ventilation is mainly for moisture and odor control. Summer ventilation is primarily for temperature control and to help keep the hogs cool.

It is necessary to provide under-floor ventilation in buildings with slotted floors. This helps to remove the toxic gases and odors that come from the manure

6.2. Warm confinement houses versus cold confinement houses

There are two general types of hog houses. **Warm confinement houses** maintain desired temperatures regardless of the outside temperature. **Cold confinement houses** have temperatures that are only slightly warmer (3 to 10 degrees) than the outside temperature.

It is more important to have warm confinement houses for farrowing and nursery facilities than for growing-finishing facilities. Some producers also use warm confinement houses for growing-finishing hogs. However, hogs of this age do about as well in cold confinement buildings.

Warm confinement houses are more expensive to build. More moisture condensation, fogging, and frost occur in cold confinement houses. However, they are less expensive.

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Warm confinement houses use mechanical ventilation systems. The design of the ventilation system depends on the area in which the house is located. Technical details of design and construction for this type of system can be obtained from agricultural engineers, university specialists, or commercial companies.

Cold confinement houses depend on natural ventilation for air movement. Usually, the house is built so one side can be opened to take advantage of prevailing wind direction in the summer. Again, technical details of location and construction design should be obtained for the local area in which the house is to be built.

Baby pigs require temperatures of 80°F to 90°F (26.7°C to 32.2°C). They must be kept dry and free of drafts. Heat lamps, brooders, and under-floor heating systems can be used to provide the conditions necessary for baby pigs. Heat lamps must be no more than 2 feet (0.6 m) above the bedding in a pig brooder. Keep the lamp and cord out of the reach of the sow.

Sows are most comfortable with air temperatures of 50°F to 60°F (10°C to 15.6°C). The body heat of the sows will provide enough heat if the building is well insulated. In cold areas, it may be necessary to provide some additional space heating. This is often done with vented, gas-fired space heaters. There is an increasing interest in the use of solar energy for heating hog houses. Consult with an agricultural engineer for the latest design details.

Weaned pigs are most comfortable at temperatures of 70°F to 75°F (21°C to 23.9°C). Growing-finishing pigs are most comfortable at temperatures of 60°F to 70°F (15.6°C to 21°C). High temperatures are more harmful than low temperatures for the breeding herd.

Energy costs are increasing. Proper insulation helps to reduce the cost of additional heat for hog houses. It keeps the interior surfaces warmer in the winter. This reduces the amount of moisture condensation on the walls and ceiling. Insulation also reduces the amount of animal body heat lost during the winter. This, in turn, helps to reduce heating bills. Fuel for uninsulated houses can cost as much as two to three times as much as that for insulated houses.

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Insulation also reduces the amount of cooling necessary in hot climates during the summer. Proper insulation makes the building cooler in the summer. This increases the comfort of the hogs and their rate of gain. It also helps to reduce the cost of cooling the building.

The amount of insulation required varies with the location of the building.

In hot weather, sows in farrowing houses require cooler temperatures than can be provided by the ventilation system. Some producers use a stream of cool air directed to the sow's nose in each farrowing crate to provide further cooling.

Sprinkling systems are also used to help cool hogs. They work best when operated for 2 to 5 minutes each hour when the temperature is about 70°F to 75°F (21°C to 23.9°C). A heavy spray should be used to cool the hogs. Fine mists or a fog are not recommended. Such systems are usually temperature-and time-controlled.

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Self-check 6	Written test
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Directions: Answer all the questions listed below.

- 1. Write the comfortable temperature for baby pigs, sows and weaned pigs? (6 points)
- 2. Discuss the use of insulated confinement for swine production? (10 points)

Note: Satisfactory rating - 16 points Unsatisfactory - below 16 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 7- Monitoring and adjusting hygiene procedures

The following hygienic procedures must be followed:

- do not allow visitors to enter poultry houses, pens, and yards.
- Clean coveralls and disinfected rubber footwear should be worn by anyone who must enter the poultry area.
- Place a foot pan with disinfectant in it at the door, to be used before entering.
- Replace the disinfectant in the pan frequently.
- Use only clean and disinfected equipment.
- All dead swine must be disposed of promptly.
- Use of incinerators, composting, or deep burying are recommended for disposal of dead birds.
- Dispose of manure by spreading it thinly on land that is not used for swine.
- Do not put swine on the land where the manure was spread for at least 4 years.
- Eliminate places for pests, such as flies, to breed.
- Do not pile up manure outside of the swine house.
- Control lice and mites inside of the house by using approved chemicals.

Proper hand washing

the single most effective way to stop the spread of disease.

- should be frequently,
 - ✦ before starting work
 - ✦ after any break,
 - ✦ after visiting,
 - ✦ after handling dirty equipment, delivery packaging, refuse
 - ✦ after cleaning surfaces or equipment

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Self-check 7	Written test
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Directions: Answer all the questions listed below.

1. Discuss about hygiene (10points)
2. Explain proper hand washing (5 points)

Note: Satisfactory rating - 15 points Unsatisfactory - below 9 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 8- Monitoring disposal of waste and debris

8.1 Introduction

Waste is a swine excreta (faeces and urine), used bedding material/feed/water plus chemicals such as pesticides whereas waste disposal refers the final disposition of solid and liquid swine farm waste, Debris is defined as the remains of something broken, thrown away or destroyed. An example broken glass, pieces of wood left on field

A large quantity of animal waste is generated by concentrated animal feeding operations and disposal of the waste has been a major problem.

8.2. Methods of waste collection

Waste collection method include:

- Ensure waste material falls through slats in floor and collects in pit below.
- Collect semi-solid and liquid waste material in lagoon.
- Place waste material in container (e.g. store,) that will prevent leakage.
- Pile waste material (manure pack) on concrete pad or on ground away from water supply to avoid contamination.
- Use of drums or storage water tanks during cleaning operation

8.3. Management of waste

Some of waste management options in swine farm are:

- Feed and water trough modification;
- Use of mechanical/automatic feeder to reduce food wastage
- Drying of manure

This involves the removal of solid hog wastes (manure), drying and applying to farms/gardens as fertilizer.

- **Waste recycling/ reuse**

Refers to the utilization of hog waste for other purposes e.g. fertilizer (solid), watering of plants (liquid), etc.

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Self-check 8	Written test
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Directions: Answer all the questions listed below.

- 1. What mean waste and waste disposal (4 points)
- 2. List waste collection methods? (5 points)
- 3. Explain waste management options? (8 points)

Note: Satisfactory rating - 17 points Unsatisfactory - below 17 points

You can ask you teacher for the copy of the correct answers.



Information Sheet 9- Monitoring feeds correct diet

9.1. Care in feeding swine.

Producers should take great care in ensuring that the swine get timely and adequate quality feeding. A single feed stuff cannot provide all the nutrients required for all body functions of the swine.

A farmer should therefore mix the different feedstuffs in proportions that satisfy the requirement for a particular type of pig (weaner, piglet or Sow). Table 6 has been developed to guide on this matter.

Table 6. Example of feed formulation for complete diets for pigs

Ingredient	Inclusion% Creep feed.	Inclusion% Weaner feed.	Inclusion% Grower feed.	Inclusion% Finisher feed.
Maize bran	45	44.5	55	57.5
Whole maize	15	16	10	10
Cotton seed cake	11	10	8.5	8
Fishmeal	7	6	8	6
Cassava meal	8	8	8	8
Premix	0.5	0.5	0.5	0.5
Sodium chloride	0.5	0.5	0.5	0.5
Brown salt	0.5	0.5	0.5	0.5
Shells	6.5	7	5	4
Sweet potatoes	6	7	4	5
Total (Kgs)	100	100	100	100

9.2. Practical feeding basics

Give the swine feeds amounting to 4% of their body weight daily. Weigh the pigs every seven days so that you can adjust the feed accordingly. The feed should be given in two equal parts: one half in the morning (9am) and the other half in the evening (5pm). The commercial feed should be supplemented with grass and crop residues which provide vitamins and some minerals. Practical feeding tips for different types of swine is summarized below.

- **Feeding during pregnancy**

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- ✓ For the first two and a half months of pregnancy the daily allowance for the Sow is 3 Kgs
- ✓ The feed intake should be increased gradually by 0.25 kg in the 11th week of pregnancy through to 0.75 kg in the last week of pregnancy. This is called Steaming up
- ✓ Do not over feed. Fat sows tend to have problems at farrowing
- ✓ A day before farrowing, cut the feed down by a half to avoid constipation

- **Lactating sow and her piglets**

- ✓ The amount of feed given to a Sow depends on the number of piglets in her litter
- ✓ The basic maintenance ration is 3 kg of Sow meal
- ✓ Add 0.25 kg for every piglet in her litter.
- ✓ As an illustration, if her ration is 3 kg and she has 10 piglets in her litter, her daily allowance will be $3+(10 \times 0.25) = 5.5$ kg per day
- ✓ Divide the feed in two equal parts. Feed one part in the morning and the other in the afternoon
- ✓ Feed greens and roughage in between the two meals
- ✓ From the 6th until the 8th week of lactation, reduce the daily allowance gradually, so that by weaning she is getting just 3 kg.
- ✓ This gradual reduction helps to dry up the sow in preparation for weaning
- ✓ Inject piglets with iron on the second or third day after birth
- ✓ Provide creep feed to the piglets 10 days after birth

- **Growing and finishing stages**

- ✓ Piglets should average 12 kg at weaning
- ✓ Growing stage is identified as the stage from weaning to about 5 months (60 kg). Such a pig is called a baconer when slaughtered
- ✓ The aim is to maximize lean muscle production and minimize fat deposition

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- ✓ Over feeding increases the proportion of fat and this may be unacceptable to the market
- ✓ The amount of feed will depend on weight of the pig
- ✓ Each pig should receive feed equivalent to 4% of its body weight. For example, if a pig weighs 60 kg, it will get $60 \times 0.04 = 2.4$ kg daily
- ✓ Since growing animals are kept in groups daily feed is obtained by multiplying the feed per pig by the number of animals in the pen
- ✓ For example, a pen holding 15 pigs of 60 kg body weight on average will require $(15 \times 60) \times 0.04 = 36$ kg daily
- ✓ Divide the feed in two equal meals to be given in the morning and afternoon
- ✓ Measure the pigs every 7 days to determine new feed ration corresponding to weight gained the previous week.

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Self-check 9	Written test
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Directions: Answer all the questions listed below.

- 1. Discuss the feeding practice during pregnancy? (4 points)
- 2. Discuss the feeding practice for lactating sows and her piglets? (10 points)
- 3. Discuss the feeding practices during growing and finishing stages (10 points)

Note: Satisfactory rating - 24 points Unsatisfactory - below 24 points

You can ask you teacher for the copy of the correct answers.



Operation Sheet 1	Teeth trimming
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Procedures:

1. Put on PPE.
2. Teeth trimming of nursing swine as follows:
 - a. Remove organic material (e.g., feces, feed, etc.).
 - b. Use high-pressure washer to thoroughly clean area and equipment.
3. Check equipment and flooring for needed make repairs as needed.
4. Apply disinfectant to teeth trimmer equipment according repairs and to manufacturers' directions.
5. hold the pig let properly
6. two persons are required, the one that holding the pig let and open the mouth properly and other one will catch the incisor (fox teeth) and pull out by teeth trimmer
7. vitamin K should provide to avoid excess bleeding



LAP Test	Practical demonstration
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Name: _____ Date: _____

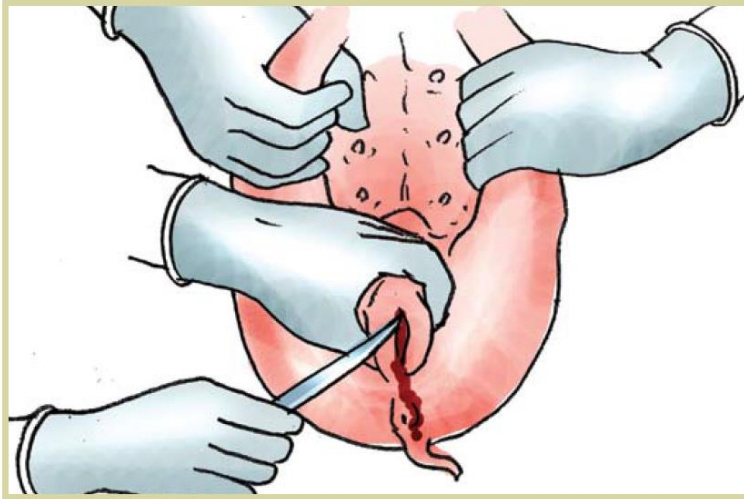
Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **10** hours.

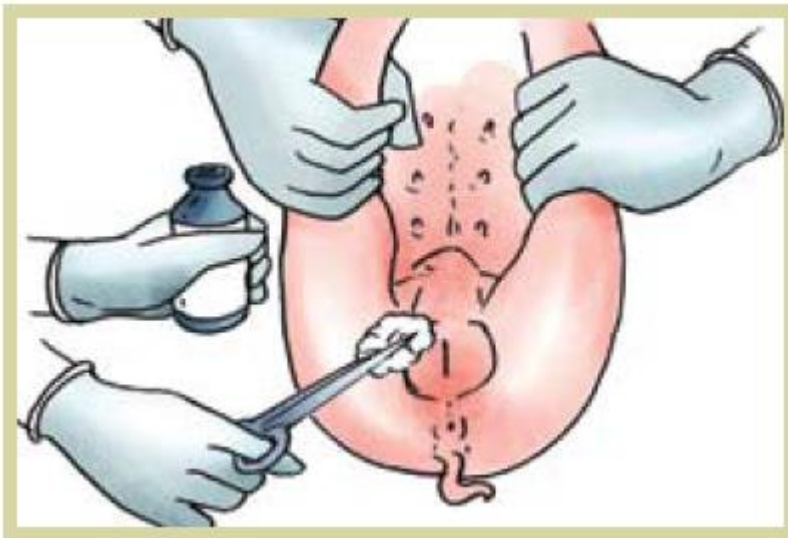
1. Preparing detail housing plan of poultry farm

Procedures:

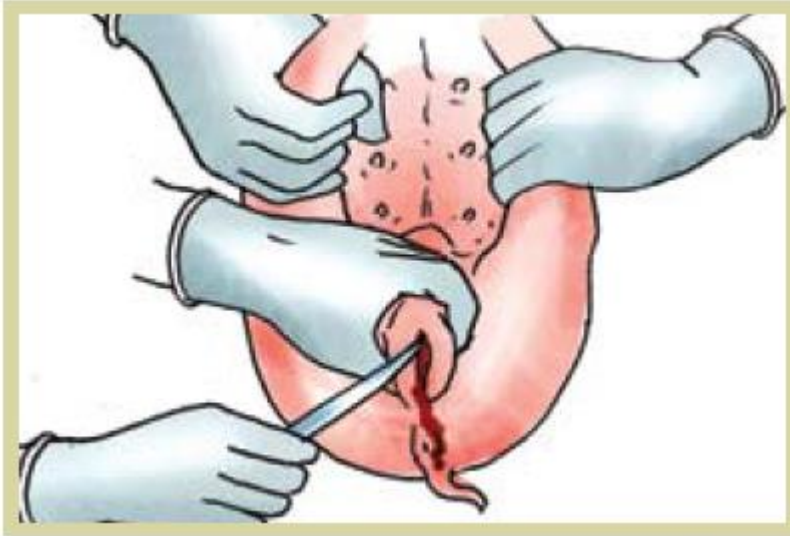
1. Put on PPE.
2. One person will carry out the small operation and the other person will hold the piglet.



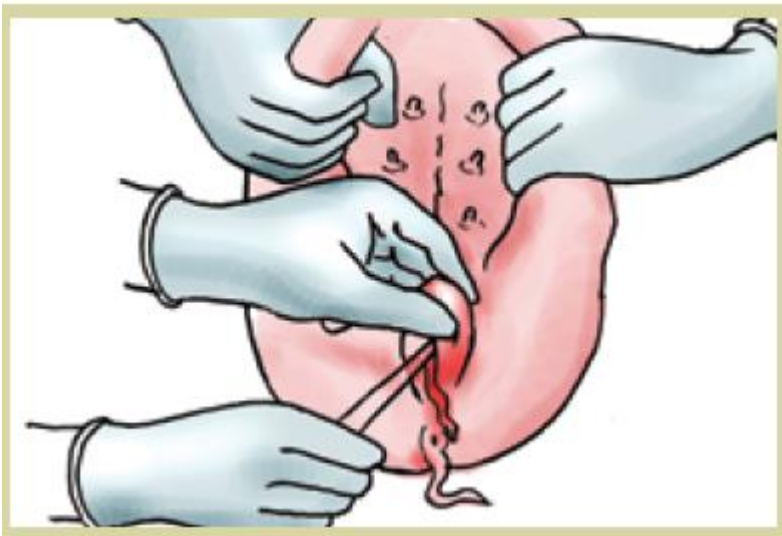
3. Wash and wipe the scrotum with a disinfectant



4. Press one testicle against the scrotal skin to tighten the skin over the testicle. Make a cut, large enough to allow the testicle to be pushed out. Uses a very sharp and clean knife for the operation



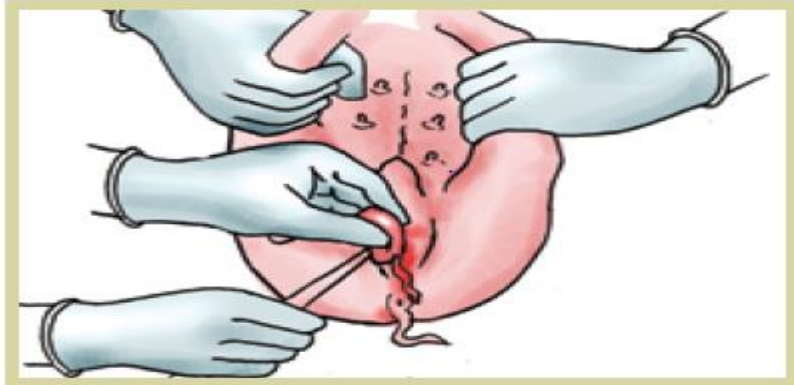
5. Pull the testicle out, so that the attached cord is also pulled to the outside.



6. Hold the exposed testicle with the left hand while the cord is twisted twice.



7. Cut the cord attached to the testicle by scraping away with the edge of the knife. There is more bleeding if the cord is cut in one stroke or sweep of the blade.



8. Afterwards wash the wounds thoroughly with a disinfectant like iodine to prevent infection. The other testicle is removed in the same way.





LAP Test	Practical demonstration
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Name: _____ Date: _____
Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 10 minute.

1. Castrating piglet



LG #93

LO #6- Carryout swine health care activities

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying the main swine diseases and parasites
- Undertaking swine health care activities

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identifying the main swine diseases and parasites
- Undertaking swine health care activities

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
19. If your performance is satisfactory proceed to the next learning guide,
20. If your performance is unsatisfactory, ask your trainer for further instructions or go back to “Operation sheets”.



Information Sheet 1- Identifying the main swine diseases and parasites

1.1 Introduction

In this information sheet you will be expect to identify the main reproductive disorder, respiratory diseases and parasites of swine, which have economic importance to the producers,

1.2. Diseases

1.2.1. Sign of sick swine

Sick swine generally have the following signs:

- It may not eat or not show interest in feed /water
- It may breathe rapidly indication of a fever
- In white skin-colored pigs the skin may become reddish.
- It may have diarrhea which may sometimes be bloody or blood stained.
- Droopy ears or ears pointing downwards.
- Dull eyes.
- Dull skin and hair.
- Its tail will become limp.
- Separates itself from the rest

1.2.2. Reproductive disorders and diseases

- **Anaphrodisias**

When the sow does not come on heat

Symptoms

No heat signs; This could be caused by low body weight due to poor feeding, overweight, mineral deficiency, intestinal worms, chronic disease, the animal has just given birth, heavy infestation with parasites

Prevention

- ✓ Improve feeding of mineral-rich feeds.
- ✓ Regularly deworm your animals.
- ✓ Allow the female to stay with the boar.

Treatment

- ✓ Gilts should not be treated at all because they may show anaphrodisias after every litter, if this hormone is used

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- ✓ Sows should be treated on the same day as weaning, and in very severe cases, 3 weeks after weaning

- **Leptospirosis**

Symptoms

- ✓ Fever, anorexia, diarrhoea, bloody urine, nervous symptoms caused by meningitis.
- ✓ Abortion in last trimester.
- ✓ In sows which are affected later, weak piglets are born.
- ✓ Mummified and macerated fetuses are common in the litters.
- ✓ Infertility associated with venereal spread may be responsible for repeat breeders.

Prevention and treatment

- ✓ Elimination of mite and rats and other rodents.
- ✓ Vaccination and hygienic measures. Vaccines are not available for all types of the diseases and vaccination may not prevent bloody urine.
- ✓ Treat all sows with injection or streptomycin before serving.
- ✓ Use antibiotics especially streptomycin for all ages.

- **Brucellosis**

Symptoms

- ✓ Anorexia, fever, stiff legs, occasional lameness, early abortion (returns to oestrus 5 - 8 weeks after service as a result of infection of service)
- ✓ Infection later in pregnancy gives rise to litter with mummified, still born or weak piglets.
- ✓ Bloody vulva discharge and endometritis.
- ✓ Retained placenta.
- ✓ Boars usually develop orchitis (inflammation of one or both testicles) and epididymitis within seven days of infection.
- ✓ The testicles are swollen and painful and permanent sterility can be the result.

Prevention and treatment

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- ✓ Prevention is based on hygienic measures and purchase of stock from clean herds only.
- ✓ Never treat by antibiotics.
- ✓ No treatment/vaccination is 100% effective
- ✓ Slaughter all animals and do restocking. Restocking should be after one month
- **Uterine Prolapsed**



Figure 30. prolapsed uterus

Symptoms

The appearance of the uterus outside the vulva.

Prevention and treatment

Uterine prolapsed reduction is often not possible since it is very traumatic and the best therapy is to amputate the whole uterus. However, 50% of sows do not survive this operation, therefore slaughter should be considered.

- **Mastitis**

Bacterial infection causes an inflammation of the mammary organ and results in changes in milk production. These bacteria enter the wounds in the udder.

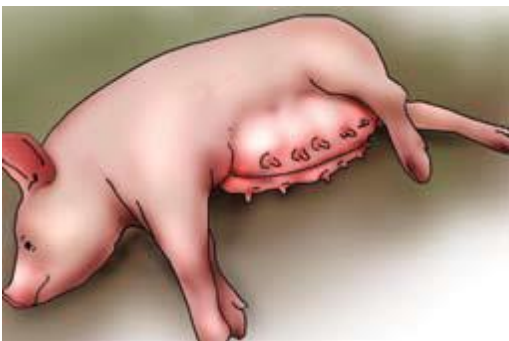


Figure 31 Mastitis infected sow



Symptoms

- ✓ Swollen, hot and painful udder.
- ✓ Absence or reduction of milk in the affected udder.
- ✓ Sow refuses to suckle her piglets. As a result, piglets squeal due to hunger.
- ✓ Sow has depression and often fever.

Prevention

- ✓ Provide adequate bedding
- ✓ Keep pig pens clean, dry and free of sharp objects, clip milk teeth of baby pigs.

Treatment

- ✓ Gently massage the affected udder with lukewarm water.
- ✓ Do not allow the young to suck milk from the infected sow.
- ✓ Remove the milk from the infected udder and discard.
- ✓ Separate sow from piglets and reduce access to teats (allow a few piglets to suckle at a time). If possible, foster piglets to lactating mothers.
- ✓ Use antibiotics. Inject penicillin-streptomycin into the muscle of hip or neck.

1.2.3. Diseases and disorders of digestive tract

Scouring

Hygienic measures should be taken to avoid or minimize scouring incidence.

Regular deworming should also be done as a control measure to scouring

Feed changes should be gradual and not drastic to avoid scouring

- **Birth diarrhoea**

Symptoms

Acute diarrhoea in piglets is watery, yellowish grey and within a very short time piglets become thin with sunken eyes due to dehydration.

Death can occur within 2 - 3 days. Death in piglets can occur even within one day before any sign of diarrhoea is observed.

Prevention

Keep pens, feed and watering troughs clean.

Separate affected animals from healthy animals.

Do not change abruptly an animal's ration.

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Make sure that piglets have sufficient colostrum within 36 hours of birth

Treatment

Vaccination

Plenty of drinking water with electrolytes

Use of antibiotics.

Herbal medicine: Fresh leaves of guava or star apple. This will treat the symptoms only.

- **Salmonellosis**

Symptoms

High fever, dullness, anorexia, weakness, nervous symptoms.

Bluish-red coloring of the ears, limbs and the center of the belly.

Bloody spots all over the body.

Wasting and persistent grayish diarrhea sometimes mixed with blood and shreds or necrotic material from the gut.

Prevention and treatment

Normal hygienic measures pelleted feed, thorough cooking of the swill.

Remove feed for two days and provide clean water.

Use antibiotics as prescribed by a veterinary doctor.

1.2.4. Diseases of the Respiratory Tract

These include Influenza, pseudorabbies, pneumonia, atrophic rhinitis and pasteurellosis.

Influenza

Symptoms

Affected animals are apathetic.

Anorexia

High fever, coughing and sneezing, difficulty in breathing

Red eyes with discharge

Loss of condition.

Prevention and treatment

Good ventilation.

Vaccination.

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No specific treatment. To prevent secondary infection, use antibiotics as prescribed by a veterinary doctor.

Pleural Pneumonia

Symptoms

Acute cases show anorexia, high fever, laboured respiration, red or blue colouring of ear-tips, belly, legs and end of tail.

Death within 4 - 6 hours of onset of clinical symptoms.

Blood stained froth from mouth or nose.

Abortion.

In chronic cases, anorexia, coughing and depressed growth rate.

Prevention and treatment

Vaccines only prevent mortality.

Use antibiotics as prescribed by a veterinary doctor.

1.2.5. Nutritional disorders

Anaemia

Symptoms

Pale skin, weak piglets with high respiratory rate.

Jaundice

Blood stained faeces.

Early death

Control and treatment

Provide iron injection or oral iron- paste containing iron

1.3. Parasites

Parasites are divided into external and internal parasites

1.3.1. Internal parasites

Roundworm

Roundworms live in the gut and take food from the pig. The pig can therefore become thin. Giant intestinal roundworms (*Ascaris lumbricoides*) are common around the world, especially in warm, moist climates. These worms are large, about the size of a pencil.

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The infection begins with the ingestion of eggs which are usually present in contaminated soil, or on fruits and vegetables grown in infected soil.

Symptoms

- ✓ Anorexia in advanced stages.
- ✓ Anaemia loss of condition.
- ✓ Weight loss in later stages.
- ✓ When the worms die suddenly after treatment, they can block the gut and cause
- ✓ sudden death

Prevention

Control with medicine in the food is useful and provide clean and dry pens.

Rotational grazing and periodic disinfection of pastures.

Separation of young ones from adults.

Washing sows before farrowing.

Periodic deworming

Herbal treatment: herbs such as moringa are considered to be anthelmintic (able to kill intestinal worms)

Tapeworm

Tapeworms are flat and long ribbon like creatures which are common in all parts of the world. Tapeworms do not have a digestive system so they receive their food through their skin as they absorb our nutrients. They especially absorb folic acid and vitamin B-12. These parasites may cause what is referred to as “verminous intoxication” as they put out and leave dangerous waste products in our bodies. These tapeworms can roll themselves into a ball and can be felt on the right side of the abdomen under the liver.

Pork measles is caused by tapeworms which live in the muscles of pigs. They do not usually affect the pig, but can lead to pain and the pig may find it difficult to move around. When people eat undercooked measly pork, the worms develop inside the people, and can make them very sick.

Symptoms

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- ✓ Poor growth
- ✓ Rough grey hair coat
- ✓ Swollen belly
- ✓ Emaciation
- ✓ Anaemia

Prevention

- ✓ Prevent the pigs from wandering about where they can feed on human faeces
- ✓ Make sure that people working with pigs use toilets (hygiene and sanitation)
- ✓ Deworming

1.3.2. External parasites

External parasites mainly include mange, lice and myiasis.

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Self-check 1	Written test
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Directions: Answer all the questions listed below.

- 1. List the sign of sick swine? (9 points)
- 2. Discuss the reproductive disorders and diseases? (10 points)
- 3. List internal and external parasites (10 points)

Note: Satisfactory rating - 29 points Unsatisfactory - below 29 points

You can ask you teacher for the copy of the correct answer



Information Sheet 2- Undertaking swine health care activities

2.1 Introduction

A well-planned herd health program is aimed at prevention of diseases and parasites, rather than their treatment.

2.2. Disease and parasite prevention

Herd health should be monitored on a continuous basis. Maintain accurate records of average rate of gain, feed intake, feed conversion, death rate, and treatments administered to the swine herd. These records form the basis for early detection of health problems

A thorough post mortem examination can accurately identify the cause of an animal's death and helps to prevent spread of a disease through the herd. Blood testing is another health monitoring technique that can measure exposure to diseases.

Observing the vital signs (temperature, pulse rate, and respiration rate) in an animal can help in the early detection of health problems. Normal vital signs in swine are

- temperature (normal range): 102.0°F to 103.6°F (38.9°C to 39.8°C); the average is 102.6°F (39.2°C).
- pulse rate (normal range): 60 to 80 heartbeats per minute.
- respiration rate (normal range): 8 to 13 breaths per minute.

Management practices such as sanitation, isolation of new stock, selecting healthy breeding stock, and proper care of sows and pigs are all part of good herd health maintenance.

Disease organisms may be carried into hog production areas by visitors. Restrict the entry of visitors into hog production facilities; if visitors are allowed to enter the facilities, make sure they are wearing disinfected footwear. A container of disinfectant and a brush for disinfecting shoes should be kept at the entrance for the use of those entering the facilities.

It is recommended that clean boots and coveralls be provided to be worn by any off-farm visitors entering hog production facilities. Provide facilities for loading and

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unloading trucks outside of the hog production area. Dogs, cats, and other animals can carry diseases that may be transmitted to hogs; keep these animals out of the hog production area. A good rat control program will also help reduce the transmission of diseases to hogs.

Vaccination and worming programs are adapted to the conditions of the individual farm.



Self-check 2	Written test
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Directions: Answer all the questions listed below.

- 1. What are the vital signs in swine? (6 points)
- 2. discuss the management practice in relation to swine health? (10 points)

Note: Satisfactory rating - 16 points Unsatisfactory - below 16 points

You can ask you teacher for the copy of the correct answers.



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WEB ADDRESSES

1. <http://www.ansc.purdue.edu/>

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AKNOWLEDGEMENT

We would like to express our appreciation to Holeta polytechnic college and experts of regional TVET bureau, who made the development of this learning module with required standards and quality possible.

We wish thanks and appreciation East Africa Skills for Transformation and Regional Integration (EASTRIP) the **World Bank** Project, who covers the financial expenses, scarifying their time and commitments to develop this learning module.

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