RWANDA POLYTECHNIC

TVET LEVEL II

AGRICULTURE

Pig Production

TRAINEE MANUAL

RWANDA POLYTECHNIC

Approved by: Workforce Development Authority

USAID FROM THE AMERICAN PEOPLE

EDC Education Development Center

2020

Acknowledgements

Rwanda Polytechnic (RP) would like to officially recognize all parties who contributed actively to the preparation of the Trainer and Trainee manuals of this module. We wish to extend our thanks to various organizations such as Workforce Development Authority (WDA), EDC through its USAID Huguka Dukore Akazi Kanoze (USAID - HDAK), TVET schools, Private Industries, GIZ Hanga Ahazaza Project and other individuals who greatly contributed from the initial concept towards publication of this training manual.

Under Rwanda Polytechnic (RP) supervision and involvement

Under Workforce Development Authority (WDA) guiding policies and directives

With funding provided by USAID through Huguka Dukore Akazi Kanoze (HDAK) project

And with technical support by Education Development Center (EDC) through local and international USAID HDAK experts

Production Team

Authoring and Review

Mr. Pierre Celestin Nsengiyumva
Mrs. Opportune Mukankurunziza
Mrs. Marie Joyeuse Nyiraneza

Conception, Adaptation, Review and Editing

Mr. Jean Marie Vianney Muhire
Mrs. Elizabeth Miller Pittman
Mrs. Lauren Hakizimana

Formatting, Graphics and Infographics

Mr. Albert Ngarambe
Mr. Simon Pierre Abayiringira

Technical Support

USAID Huguka Dukore Akazi Kanoze (HDAK) project
implemented by Education Development Center (EDC)

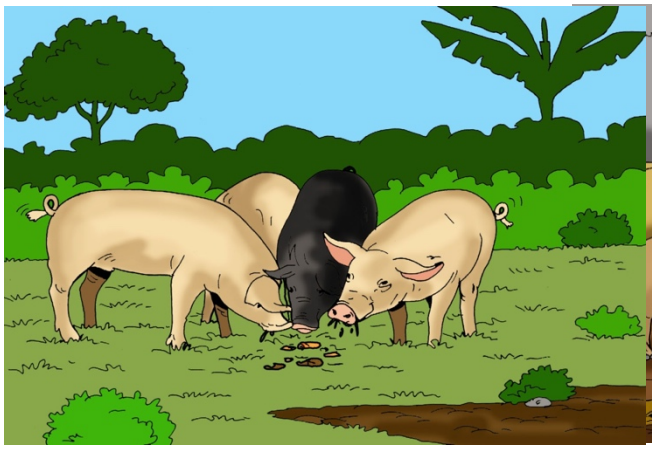
Pig Production

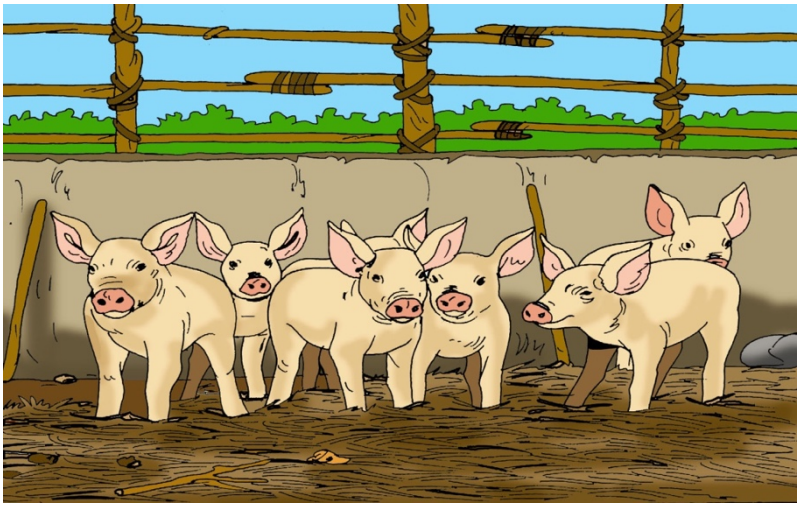
Unit 1: Fattening

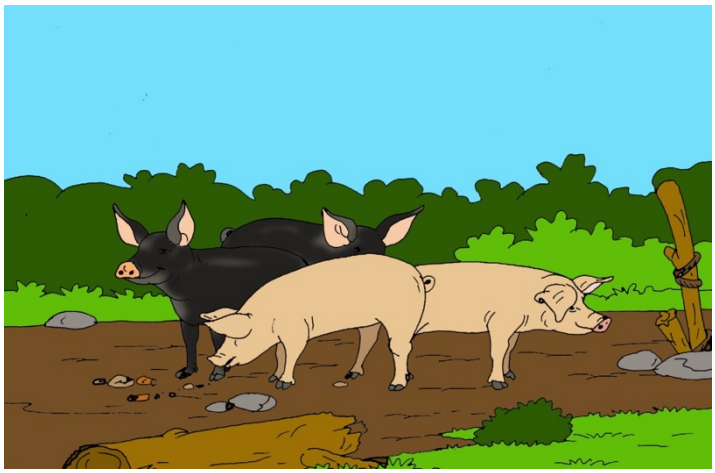
Unit 2: Production of piglets

Unit 3: Piggery operations

Unit 1: Fattening







Topics

1.1 Identification of piglets for fattening

1.2 Application of good feeding practices

Unit Summary:

This unit describes the knowledge, skills and attitude required to fatten piglets. At the end of this unit, the trainee will be able to identify piglets for fattening and apply good feeding practices.

Self-Assessment: Unit 1

1. Look at the unit illustration above. What do you observe? What do you think this unit will be about? What topics might be covered?

2. Fill in the self- assessment below.

There are no right or wrong ways to answer this assessment. It is for your own use during this unit. Think about yourself: do you think you can do this? How well? Read the statements across the top. Put a check in column that best represents your situation. At the end of this unit, you wiil take this assessment again.

My experience **Knowledge, skills and attitudes**	**I don't have any experience doing this.**	**I know a little about this.**	**I have some experience doing this.**	**I have a lot of experience with this.**	**I am confident in my ability to do this.**
Identify pig breeds					
Use handling techniques for pigs					
Describe feeds and water required in pig farming					
Weigh and distribute feeds					
Clean feeders and drinkers					
Select appropriate breeds of piglets for fattening					
Explain factors to consider when organizing piglet transport					
Keep records of piglets for fattening					

Topic 1.1: Identification of piglets for fattening

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe factors considered when selecting breeds of piglets for fattening.	**1.** Select right breed of piglets for fattening	**1.** Attentive to details
2. Explain factors to consider when organizing transport	**2.** Equip piglets and handle piglets in different situations.	**2.** Patient
3. Identify information of piglets for fattening	**3.** Keep record of piglets for fattening	**3.** Thorough

Getting Started: What do we know and where are we going?

Topic 1.1 Task 1:

1. Answer questions below about pigs:

a. Have you or anyone in your community ever raised pigs?

b. Mention some of the breeds of pigs you know.

c. What do you consider when choosing a piglet for rearing?

d. How do you prepare a piglet in order to sell it?

e. Have you ever heard of the term fattening? What is it? Why is it done?

2. After the brainstorm activity above, what topic you think this activity relates to?

Problem Solving Activity

Topic 1.1 Task 2:

1. In a small group of 4 to 5 trainees, read the scenario and answer the questions that follow.

Nzabarinda has been doing pig farming for about 4 months on a small scale with 2 pigs (a boar and sow). He wants to improve on his business by introducing 5 more piglets. His

target is to meet the increased demand for pork during the festive season which is coming in 7 months. So, he wants to prepare the 5 piglets for that season. He has approached you as a friend with knowledge on producing pigs, especially fattening, for assistance. As a skilled trainee in pig farming, you are requested to:

2. Help Nzabarinda to identify and install piglets for fattening by answering the following questions:

a. Explain the factors he should consider while selecting the piglets.

b. The piglets are in a nearby village about 10 km away. What should he do when organizing transport for the piglets?

c. Describe to him how he should handle the piglets during restraining and loading up to the time of selling them.

d. Explain to him what to consider when the piglets are installed at his farm.

e. Explain to him the type of records and information to keep about the piglets.

3. After sharing your answers with the large group, review **1.1 Key Facts** together. Supplement your answers with any new information learned.

1.1 Key Facts[1][2]

- **Identify piglets for fattening**

  - **Pig**, **hog** or **swine**, is a name of the whole species, or any member of it. *Pig/Swine* is a common name for the domesticated species, *Susscrofadomesticus.*
  - Pig fattening has intensive diet to maximize its growth at the best cost, in the respect of the environment. The feed is generally formulated based on the average requirement of the batch (group of animals) depending on the average weight of group, its genetic type and the distribution system of the farm and the cost of cereals.

- **Selection of piglets is based on:**

  - Main races/breeds of pigs in Rwanda: Local breed pig, Large White, Landrace, Pietrain, Duroc Jersey, Tamworth, Yorkshire.
  - Products: meat/pork and lard.
  - Markets - purchasing and selling piglets:
    - Purchase piglets that have been weaned from their mother for at least 1-2 weeks.
    - If possible, purchase piglets from one source or farm.
    - Purchase piglets that are of high quality and healthy.
    - Avoid buying piglets that are being peddled (you are not assured of its health and quality).

- **Characteristics of piglets /parents of piglets**:

  - Piglets should be about 8 weeks old.
  - Minimum weight of piglets should be about 15kg.
  - Piglets should start taking feed during the time of procurement.
  - It should be healthy, active and free from any skin or other diseases.
  - Piglets should have fine shiny hair coat (should not be too hairy).
  - The parents (boar and sow) should be seen to understand their breed characteristic, feed habitants, health conditions, mothering ability, etc.

[1] Irekhore, O. (May 2012). *General Overview of Pig Production, Enterprise Selection and Establishment*. https://www.scribd.com/document/240299980/Pig-Production-Training-Manual-Original

[2] Deka, R. and Wright, I. (July 2011). *Training Manual on Smallholders' Pig Management*. ILRI Asia Office. https://cgspace.cgiar.org/bitstream/handle/10568/12533/TrainigManual_Pig.pdf?sequence=1

- In case of female piglets, their available number and size of teats should be seen there should be minimum 6 pairs (12 numbers) of teats equally distributed on both sides.
- In case of male piglets, testicles should be uniformly developed.

- **Organization of transport is based on preparation of piglets**

  - Add vitamins and electrolytes or anti-stress medications to the drinking water at least two days before transport and continue 3-5 days after arrival
  - Transport the pigs during the coldest part of the day. The vehicle should be well ventilated and protected against direct sunlight.
  - 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.
  - Do not mix big and small animals.
  - Do not fully feed the pigs during transport. Drinking water should be given during long trips.
  - Group pigs according to size.
  - Loading facilities should be provided in the delivery truck.
  - Carefully load and unload the pigs from the truck or vehicle
  - The floor of the truck or vehicle should be bedded with sand or sawdust. This should be wet during hot weather.
  - Slow down the vehicle during transport especially at sharp curves.
  - Remove all protruding nails and other pointed objects on the floor or sides of the truck.
  - Do not excite or over-heat pigs. This will make pigs in feverish condition and its meat tend to sour.

- **Handling of piglets:** Piglets can be restrained in two ways:

  - **Restraining a piglet on its side** (for injection/vaccination/treatment):
    - At first, place the piglet in room or pen where it is to be restrained.
    - After cornering piglets, grasp its hind leg firmly with one or both hands and lift it completely off the floor with its head down.
    - Hold the rear leg with one hand and use the other hand to grasp the front leg on the same side of the pig.

- Use your knee to put pressure on the side of the pig to retain the control.

- **Restraining a piglet by holding rear le**gs (for transportation):

  - At first, place the piglet in room or pen where it is to be restrained.
  - After cornering piglets, grasp its hind leg firmly with one or both hands and lift it completely off the floor with its head down.
  - Catch the piglet by grasping a rear leg with one or both hands.
  - Quickly adjust your grip and hold the pig's back in front of your legs. The nose is directed towards the ground.
  - Lift the piglet bringing both the rear legs to about the height of your waist.

Restraining a piglet by holding its rear legs
Ref: Training Manual on Small Holders' Pig Management, p. 21.

  - Installation of piglets based on infrastructure, density and equipment; record card keeping based on identification, weight, age, treatment and death.

- **Installation of piglets**

  - Follow the following space requirements for growers and fatteners:

- One weaner piglet occupies 0.55m^2-0.9m^2.
- One grower/finisher piglet occupies 0.55-1m^2.
- 40-45 weaner piglets will occupy one pen, while fattening pigs will require a density of 30 piglets per pen.

    - Weaner is a piglet that has been separated from its mother to become fully mature.
    - Grower is a pig from 30-60 kg or about 3-5 months old.
    - Fattener is a pig from 60-90 or about 5-6 months.

- Provide feeding where all pigs can eat at the same time.
- Provide proper ventilation in the pig house and avoid overcrowding.
- The pens should be regular cleaned.
- Bathe or spray the animals especially during hot weather (27 degrees).
- Follow the proper feeding guide based on its nutritional requirements.

- **Record keeping:** to keep record is simply to collect relevant information that can help you to take good decisions and to keep track of activities, production and important events on a farm.

    - **Types of records:**
        - Identification
        - Breeding
        - Production
        - Feeding
        - Disease and treatment records
        - Financial records

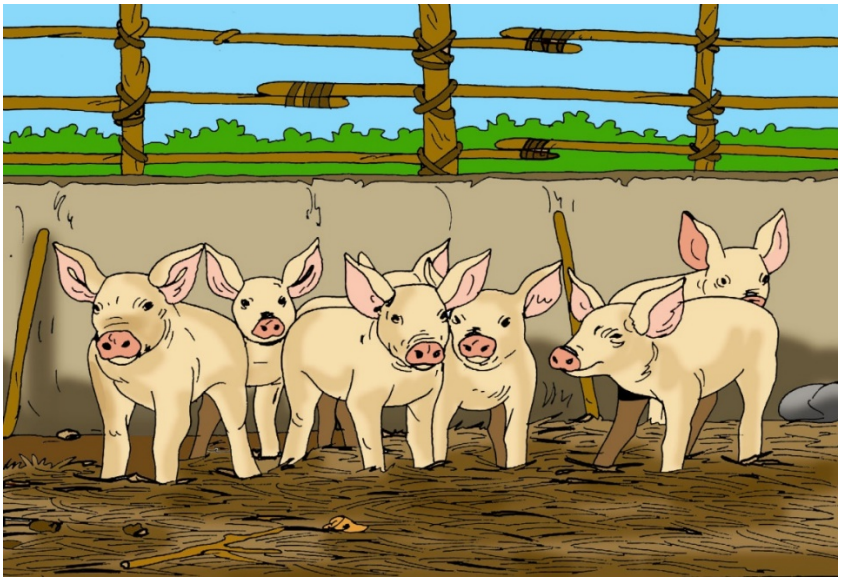
    - **Importance of records**
        - To keep track of all animals (Identification records)
        - Evaluation of livestock for selection (breeding records, financial records, production records)
        - Control of inbreeding and aid in breeding planning (breeding records)
        - Aid in selecting animals with the right characteristics for breeding (production, health, feed efficiency) to improve the herd or flock
        - To rationalize labor
        - Aids in feed planning and management
        - Aids in disease management; keeping track about treatment (disease records)
        - Aids in finding the effective treatments
        - To assess profitability/losses (financial records)
        - Improves bargaining power on products, because you can see the investment and the price of the production (financial records)
        - Credit/loan access (financial records)

Guided Practice Activity

Topic 1.1 Task 3:

1. You will be given photos or pictures related to pig rearing: different races or breeds of piglets; transportation of pigs; record keeping, …
   a. Describe the similarities and differences between the breeds / races by highlighting the characteristics among them.
   b. Mention some local breeds in Rwanda that can be selected for fattening and give reasons.
   c. Describe the different types of transport and best practices to use when transporting piglets in Rwanda. What are the advantages and inconveniences of these kinds or ways of transport?
   d. Describe the kind of records and information kept by pig farmers and its importance.
2. Share your responses with the large group.
3. After the presentations, read and discuss **1.2 Key Facts** together with the class and trainer. Supplement your answers to the questions with new information learned.

1.2 Key Facts[3]



- **Local breed**

  - The live weight of the adult can reach 100 kg in a rational farming. Small and often black. Potential productivity: It gives meat. (70% of live-weight) Hardiness and environment: it is quite resistant. Tolerant to food deficiencies.

- **Landrace pig**

  - Landrace breed is characterized by a long body, white hair on a white skin. Ears are horizontally directed forward, long head with concave profile. Its weight in adulthood varies from 280 kg sow and 320 kg for boar. Potential productivity: this breed is called “butcher pig”. Meat: 70% of live weight.
  - Hardiness and environment: its optimal temperature is between 12 and 15°C. Little resistant, demanding fresh environment.

- **Large White pig**

  - It is a large pig, with a parallelepiped elongated body, with erected ears, with strong limbs. Coat is uniformly light, white, without blemish, with white hair on a white rind, adult weight is respectively of 280 and 320 kg; Potential productivity: It produces a very good quality meat (75% of live- weight)

[3] Food and Agriculture Organization of the United Nations. (2009). *Farmer’s Hand Book on Pig Production*. FAO Nepal.
http://www.fao.org/ag/againfo/themes/documents/pigs/Handbook%20on%20Pig%20Production_English%20layout-Vietanm-Draft.pdf

- Hardiness and the environment: It is known for its resistance and easy adaptation to various climates and environment. Its ideal temperature is between 12 and 15°C.

- **Transportation of piglets:**

  - Piglets should be fed and watered properly 12 hours before loading depending on distance, temperature and treatment upon arrival.
  - Avoid transporting the piglets in warm day time, preferring travel at night or in the evening.
  - Types of transport:

    - Road
    - Truck/mini truck/auto van
    - Train in long distance

Application Activity

Topic 1.1 Task 4:

1. Visit a pig farming site at the school or in the neighboring community

2. Make a report of what you observe or discuss with the owner following the instructions below:

a. Observe the piglets and name the race or breeds.

b. Ask the farmer or manager why they preferred that race/breed.

c. List and briefly explain the kind of transport used to transport the piglets observed.

d. If you did not observe any kind of transport, you can ask the farmer or manager how they transport the piglets.

e. List and briefly explain any form of handling the piglets you observed.

f. Comment on the way the piglets were installed in terms of infrastructure, density, equipment, etc...

g. Mention any form of recording observed. What type of information was recorded? If you did not observe any, ask the farmer or manager if they keep records and the type of information they record.

3. Share your findings with the rest of class.

Points to Remember

- To select piglets to fatten, exotic breeds such as Large White, Landrace and Pietrain are more productive than local breeds.
- Select piglet with no deformities.
- Consider health status when you select piglets for fattening.
- To install piglets newly in piggery for fattening, they start with weaner piglets of 15 kg of body weight at 4 weeks old of weaning period.

Formative Assessment

1. Name three of the main pig breeds reared in Rwanda.

2. Answer by true or false

a. Piglets should be fed and watered 1 hour before being transported.

b. Piglets should be transported by truck or auto van.

3. What type of information might one find in records related to pig rearing?

Topic 1.2: Apply good feeding practices

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe feeds and water required in pig farming	**1.** Weigh and distribute feeds	**1.** Methodical
2. Describe information to be recorded	**2.** Keep records	**2.** Careful
3. State how to clean feeder and drinkers	**3.** Clean feeders and drinkers	**3.** Precise

Getting Started: What do we know and where are we going?

Topic 1.2 Task 1:

1. We are going to talk about feeds.

2. Through a brainstorm, answer questions below about feeds:

- **a.** Mention some types of pig feeds you know.
- **b.** How can we prepare pig feeds?
- **c.** How do we clean feeder and drinker?
- **d.** How do we distribute the feed and water?
- **e.** What is the importance of keeping records?

Problem Solving Activity

Topic 1.2 Task 2:

1. Form small groups of 4 to 5 trainees and read a scenario and answer questions that follow.

Habimana is pig farmer. He has a problem of low rate of growth of pigs according to their age. As a skilled trainee in pig farming, you are requested to provide information on feeding:

a. Identify types of pig feeds.

b. Explain how to mix and store the feeds.

c. Describe how to clean the feeders and drinkers.

d. Explain how to distribute feed and water.

1.3 Key Facts

- Apply good feeding practices. The types of **pig feed** are the following:
  - Roughage: grasses and legumes from pasture, straws, camelinas…
  - Concentrates: grains of cereals, brans, soybean, …
  - Feed additives: antibiotics, hormones, proteins, minerals and vitamins.
  - Water: clean water ad libitum
- The **nutrients** needed by pigs:
  - Carbohydrates and lipids, sources of energy
  - Proteins or parotids, sources of amino acids
  - Vitamins
  - Minerals
  - Water
- **Weighing**
  - Weigh feed ingredients based on animal characteristics such as age, breed and weight. These characteristics determine the dietary requirements.
- **Mix ingredients: Mixing** is important in order to homogenize the structure of the concentrates and to enable equal composition in every scoop of concentrate. In addition, it prevents animals from eating only components they prefer from the mix. Ingredients can be mixed using:
  - **Mechanical mixing**

- **Manual mixing on a clean concrete floor or canvas**

- **Storage**

  - The concentrated feeds should be stored in dry area and in plastic bags.

- **Cleaning**
  - **Drinkers:** Clean the drinkers with clean water
  - **Feeders:** Remove any food remains in feeder and clean it with a clean water

- **Feed distribution**[4]

  - Measuring amount feed to distribute is the only way to determine the amount of each nutrient consumed by animal according to age, breed, workload, metabolism, and weight. Underfeeding can result in loss of production. Overfeeding will cause wastage of expensive feed.
  - Pigs are fed twice or thrice a day with the following amount of feed by age:

Age	Quantity of feed
1-2 months	0.5kg/day
2-3 months	1 kg/day
3-4 months	1.25kg/day
4-5 months	1.5 kg /day
5-6 months	2 kg /day
Boar and Pregnant Gilt	2.5 kg/day

- **Water distribution**
  - **Water quality**

    - Good quality water is clean, clear, odorless and without a high mineral content. Water quality is lowered by soluble salts, algae, pollution (dead animals, bird feces or debris) and clay (in-suspension). These materials may cause the animals to refrain from drinking the water, go off their feed, lose condition, stop lactating or die from disease or toxicity.

  - **Water quantity**
    - Pig should have free and convenient access to water, beginning before weaning. The amount of water required varies with age, type of feed, environmental temperature, status of lactation, fever, high urinary output or diarrhea. Normally, growing pigs consume 2-3 litres of water for every kg of dry feed.

- **Feeding Records**
  - Feeding records give information about the amount, type and quality of the feed
  - Feeding records can be used both for day to day management and adjustment of the feed ration. Together with the production data, it can for example be used to adjust if a milking cow needs more concentrate or help in decisions about examining animals which seem to not grow, but still eat very much. It can also be used for planning of activities related to feed conservation and establishment of grazing areas in the following season.

Guided Practice Activity

Topic 1.2 Task 3:

1. You will go to the pig farm at your school to practice food and water distribution for pigs. In your small group:
   - **a.** Identify the types of feeds used in pig feeding at your school.
   - **b.** Weigh the different ingredients and mix them.
   - **c.** Clean the drinkers and feeders.
   - **d.** Distribute the feed and water.

2. Review the information in **1.3 Key Facts** to help you check the answers to the questions.

3. Additional problems to determine the quantity of food and water:
   - **a.** How much food and water would you need to feed 5 pigs that are 6 months of age?
   - **b.** How much food and water would you need to feed 20 boars?

Application Activity

[4] Government of Sikkim. (n.d.). *Piggery Farming*. http://www.sikkim-ahvs.gov.in/Tutorial/English%20Booklets/PIGGERY_BOOKLET.pdf

Topic 1.2 Task 4:

1. Choose one or more pig farms in your neighborhood and fix an appointment with the farmer. Ask permission to assist in selecting pig feeds,weighing the feeds and mixing them, cleaning drinkers and feeders and distributing feed and water. You will write a short (one half page) report on the experience in the workplace.

2. Note down the important points and prepare a report after the visit, aiming to answer the following questions:

   a. What types of feed were used?

   b. How were the drinkers and feeders cleaned?

   c. How were the feed and water distributed?

3. Do a class presentation to the rest of the class on your findings.

Points to Remember

- Pigs are fed twice or thrice a day with the following amount of feed by age:[5]

Age	Quantity of feed
1-2 months	0,5kg/day
2-3 months	1,0 kg/day
3-4 months	1,25kg/day
4-5 months	1.5 kg /day
5-6 months	2. kg /day
Boar and Pregnant Gilt	2.5 kg/day

- Normally, growing pigs consume 2-3 litres of water for every kg of dry feed.
- Pigs require feed for body maintenance, growth, production and reproduction. Feeds supply nutrients which are used to meet these biological needs.

[5] Government of Sikkim. (n.d.). *Piggery Farming*. http://www.sikkim-ahvs.gov.in/Tutorial/English%20Booklets/PIGGERY_BOOKLET.pdf

Formative Assessment

1. Identify the types of feed that should be given to pigs.
2. Demonstrate how to weigh feed for 10 piglets of 3 months.
3. Ask trainees to calculate the amount of feed and clean water to give piglets of five months old.
4. Ask trainees to list the type of information one could record in feeding piglets.

Self-Reflection

1. Re-take the self-assessment you did at the beginning of the Unit. Remember, it is not a test but is rather to see progress you have made in your knowledge and skills related to pig production.

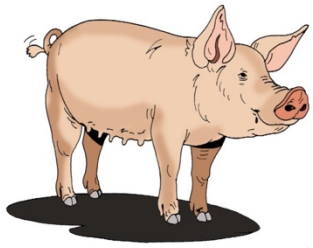
My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Identify pig breeds					
Use handling techniques for pigs					
Describe feeds and water required in pig farming					
Weigh and distribute feeds					
Clean feeders and drinkers					
Select appropriate breeds of piglets for fattening					

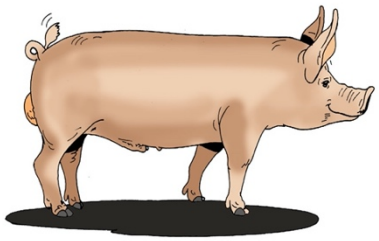
My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Explain factors to consider when organizing piglet transport					
Keep records of piglets for fattening					

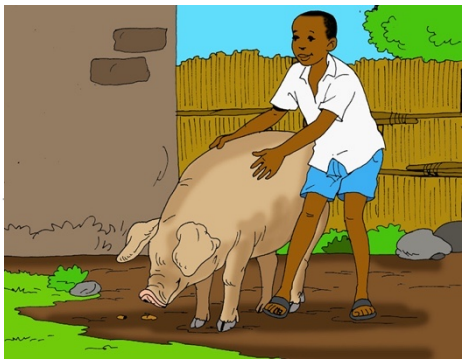
2. Reflect on the results of the self-reflection and the work you have done during this unit. Fill in the table below.

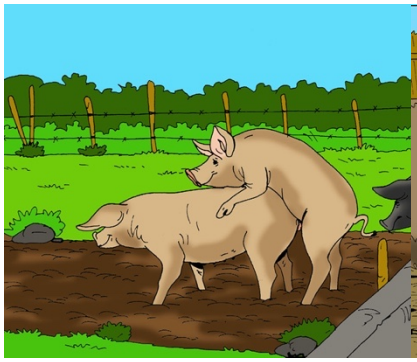
Areas of strength	Areas for improvement	Actions to be taken to improve
1. **2.**	**1.** **2.**	**1.** **2.**

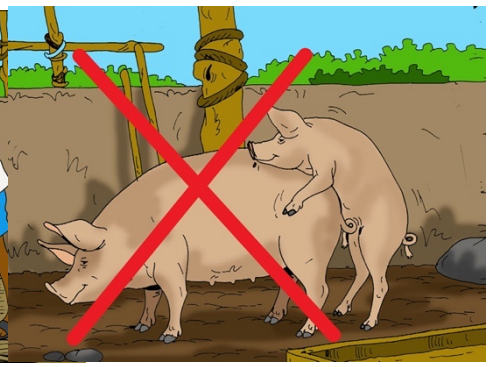
Unit 2: Production of piglets

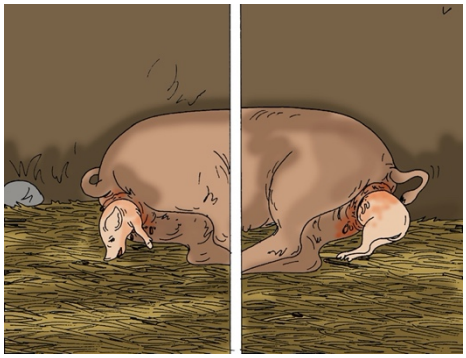


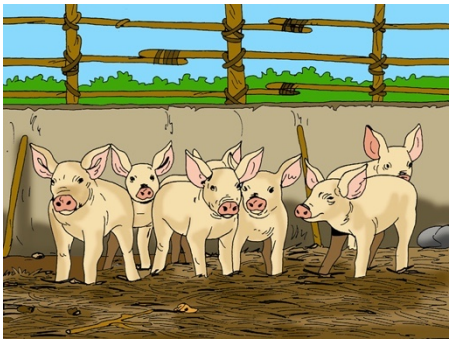


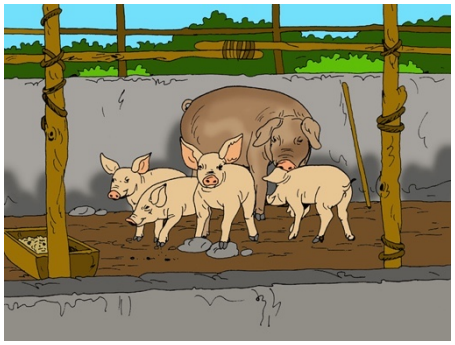












Topics

2.1 Selection of breeds

2.2 Detection of heat

2.3 Assisting in mating

2.4 Monitoring pregnancy

2.5 Assisting farrowing

2.6 Weaning

Unit Summary:

This unit will equip trainees with knowledge, skills and attitude to produce piglets. At the end of this learning unit trainees will be able to select breeds, detect heat, assist mating, monitor pregnancy, assist farrowing and perform weaning with close supervision.

Self-Assessment: Unit 2

1. Look at the learning unit illustration above. What do you observe? What do you think this unit will be about? What topics might be covered?

2. Fill in the self-assessment below.

There are no rights or wrong ways to answer this assessment. It is for your own use during this course. Think about yourself: do you think you can do this? How well? Read the statements across the top. Put a check in column that best represents your situation. At the end of this unit, we'll take this assessment again.

My experience **Knowledge, skills and attitudes**	**I don't have any doing this.**	**I know a little about experience this.**	**I have some experience doing this.**	**I have a lot of experience with this.**	**I am confident in my ability to do this.**
Select boars and sows for breeding					
Check physical appearance and reproductive capacity of sows and boars					
Check health status of sows and boars					
Identify malformations and diseases					
Detect when a sow or gilt is in heat					
Describe how synchronization is done in pig farming					
Synchronize the period of heat for sows/gilts					
State necessary information to be recorded					
Outline characteristics of a productive boar					

My experience Knowledge, skills and attitudes	I don't have any doing this.	I know a little about experience this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Diagnose a pregnant sow/gilt based on signs					
Feed pregnant sows					
List signs that sow is ready to give birth (farrow)					
Describe farrowing process					
Prepare farrowing room					
Install weaned piglets					
Perform transition from milk to dry feed					
Determine weaning period					
Wean piglets					

Topic 2.1: Selection of breeds

Key Competencies:

Knowledge	Skills	Attitudes
1. Identify breeds	**1.** Select breeds	**1.** Attentive
2. Describe physical appearance and reproductive capacity	**2.** Assess physical appearance of sows and boars	**2.** Open minded
3. Identify congenital and hereditary defects	**3.** Determine health status of pigs	**3.** Careful

Getting Started: What do we know and where are we going?

Topic 2.1 Task 1:

1. In your group assigned by your trainer, respond to the following questions.
   a. Quick review: What are typical pig breeds reared in Rwanda?
   b. When breeding pigs, what are some of the physical and reproductive traits one should consider?
   c. Give examples of congenital (present at birth) and hereditary (passed down from parents) defects of pigs.

Problem Solving Activity

Topic 2.1 Task 2:

1. In your small group, read the following scenario and respond to the associated questions. Use **2.1 and 2.2 Key Facts**, books in the classroom on pigs and the internet as resources to help you learn more and answer the questions.

   Kalisa is a pig farmer who lives in Muhanga District. He wants to increase his pig production but does not know how to identify the right breed or the physical features to consider when selecting pigs for breeding. As a skilled trainee in pig farming you are called to help him to:

   a. Identify good breeds.
   b. Explain how to assess physical appearance and reproductive capacity.
   c. Explain how to identify diseases or malformations.

2.1 Key Facts

Selection of pig breeds

- It is based on:
  - **Races**: Local breed pig, Large White, Landrace, Pietrain, Duroc Jersey, Tamworth, Yorkshire
  - **Products:** meat/pork and lard.
  - **Markets:** purchasing and selling piglets:
- Selection is defined as the process of allowing certain animals to be parents of future generation.

- The selection of pig breeds is based on selection criteria which are factors to consider when choosing a breeding stock/animals to be parent of future generation.

- For selection to be carried out effectively, the farmer should consider the following:
  - **Productivity of parent:** Select animal whose parents are good producers of pork or bacon …
  - **Adaptability:** Animal chosen should be able to adapt to environmental conditions without losing weight.
  - **Age:** Select animal which are still young but have attained sexual maturity. Avoid old animals as their productivity level decreases with increasing age; young animals can stay in production for a long time.
  - **Physical appearance:** Animals chosen should conform to the characteristics of a pig that is a pork or bacon producer.
  - **Feed conversion rate:** Animals chosen should have the ability to change food eaten into useful products such as pork or bacon.
  - **Health status:** Animals chosen should not have health problems. When selecting animals avoid those whose parents have inheritable diseases.
  - **Resistance against diseases:** Animals which show resistance to common diseases should be selected. This enables them to survive in case there is an outbreak.
  - **Productivity:** Choose animal that can produce a large litter and large amounts of pork or bacon.
  - **Maturity period:** Select animals which have a high growth rate. This means that they can reach the production or breeding stage quickly. This will contribute to an increase in the number of animals on the farm. Early maturing animals can be sold off early and the farmer will be able to realize profit in a short time.
  - **Fecundity (fertility):** Animals chosen should farrow down (birth) easily and regularly; prolific animals should be chosen.
  - **Temperament:** Choose those which have good temperament. This enables easy handling.

2.2 Keys Facts

1. **Characteristics of a good sow (for reproduction)**
    - **a.** A good sow should have at least 12 normal teats.
    - **b.** Age of sow for reproduction should not be below 7 months.
    - **c.** They should be the biggest and heaviest of the litter.
    - **d.** They should have strong legs and walk well.
    - **e.** Their parents should be good breeding animals capable of producing good litters at regular intervals.

2. **Characteristics of a good boar (for reproduction):**
    - **a.** Boar should be healthy.
    - **b.** A boar should be at least 8 months old at the time of breeding.
    - **c.** It should have both testicles well-positioned and size should match with its body size and age
    - **d.** There should not have any injury on the body
    - **e.** Boar should have good sex libido.

3. **Malformations** include:
    - **a.** Splay leg

 [6]

    - **b.** Absence of anus (atresia)

 [7]

[6] Pig333 (n.d.). *Impaired Motility in Newborn Piglet – Atlas of Swine Pathology*. https://www.pig333.com/pathology-atlas/impaired-motility-in-newborn-piglet_204

[7] Carr Consulting. (n.d.). *Diseases of the Gilt and Young Boar*. http://www.carrsconsulting.com/thepig/disorders/diseasebysystem/diseasesgilts.htm

c. Hernia

 [8]

d. Lack of milk (agalactia)

Guided Practice Activity

Topic 2.1 Task 3:

1. In small groups, with the assistance of your trainer, go to the school's farm and perform the following:

a. Identify the pig breeds and select the breed you think would be best for breeding.

b. Check the physical appearance and reproductive capacity of sow and boar.

c. Select a sow and boar you think would be the best to breed. Explain why.

d. Select the sows and boars that have congenital and hereditary defects so they can be culled.

[8] University of Minnesota: College of Veterinary Medicine, Minnesota Veterinary Anatomy Courseware Web Site (January 2020). *Veterinary Anomalies: Musculoskeletal – Image 5*. http://vanat.cvm.umn.edu/vetAnomal/sysMS/MS5.html

Application Activity

Topic 2.1 Task 4:

1. Identify one or more pig farms in your neighborhood and fix an appointment with the farmer. Explain to the farmer that you are learning about:
    a. Identifying pig breeds.
    b. How to select future boars and sows by assessing pigs' physical appearance and reproductive capacity.
    c. Identifying any diseases or malformations that would require pigs to be culled.

2. Ask the farmer permission to observe and assess his or her pigs. Also ask if s/he will share his or her experience in raising and breeding pigs. Use the information found in **2.1 and 2.2 Key Facts** to ask the farmer questions.

3. Write a short report (one half page) on your observations and key learning points gained through workplace exposure. Be sure to touch on the categories found in **2.1 and 2.2 Key Facts**. The following questions should be addressed in the report:

    a. What types of breeds are reared and why?

    b. What did you observe and learn about the physical features and reproductive capacity of the boars and sows?

    c. How do they farmers select which sows and boars to breed?

    d. Based on your interview of the farmer and your observations of the pigs, do you think there is potential for this farm to improve their production? Why or why not?

    e. What types of congenital and hereditary defects or diseases did you observe or the farmer mention? Will any of the pigs need to be culled because of defects?

4. Do a class presentation to the rest of the class on your findings.

Points to Remember

- A boar should be at least 8 months old at the time of breeding.
- A boar to be selected from a herd for breeding should have normal sex organs and be active, healthy and strong.
- Sows selected must have at least 12 teats so as to accommodate a large litter.

- Gilt should be selected from sows that have weaned 9-10 or more piglets per litter and are known to be good mothers.

Formative Assessment

1. Respond to the following questions:

a. What are the main elements to consider when choosing a sow?

b. What is the earliest age a boar can be used for breeding?

c. Give an example of a deformity one could find in a pig.

Topic 2.2: Detection of heat

Key Competencies:

Knowledge	Skills	Attitudes
1. Outline sign of heat in pig	**1.** Detect heats	**1.** Careful
2. Describe how synchronization is done in pig farming	**2.** Synchronize heats sow and gilt	**2.** Observant
3. State necessary information to be recorded	**3.** Keep record	**3.** Attentive

Getting Started: What do we know and where are we going?

Topic 2.2 Task 1:

1. Share with a partner what you know about breeding pigs. Use the questions below to guide your discussion. Add to what you already know by researching the answers in any available books in the classroom or on line.

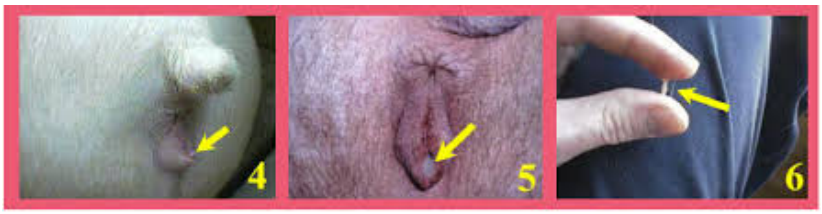
- **a.** How does one know when pigs are ready to mate (when are female pigs in heat)?
- **b.** How often can pigs mate?
- **c.** How can pig farmers try to control mating periods so pigs give birth during the same period? What is this called?

Problem Solving Activity

Topic 2.2 Task 2:

1. In your group, perform the following tasks to deepen your understanding of the signs of heat, methods of synchronization and keeping records.

- **a.** Describe the sign of heat that is shown in each picture. Add other signs of heat not pictured here at the end. After you have tried it without using any resources, read about signs of heat in **2.3 Key Facts**.

Signs of Heat in a Sow	
Image	**Description**
[9] 	
 [10]	-
[11] 	

[9] Food and Agriculture Organization of the United Nations. (2009). *Farmer's Hand Book on Pig Production*. FAO Nepal. http://www.fao.org/ag/againfo/themes/documents/pigs/Handbook%20on%20Pig%20Production_English%20layout-Vietanm-Draft.pdf

[10] Belstra, B., Flowers, W., See, T. and Singleton, W. (2007, July 31). *Estrus or Heat Detection*. https://porkgateway.org/resource/estrus-or-heat-detection/

[11] Linden, J. (2013, May 23). *Effective Heat Detection* at the The Pig Site. Copyright © thepigsite.com/ - *Reproduced with Permission(permission granted for nonprofit making organisations). https://thepigsite.com/articles/effective-heat-detection*

[12]  	-
Other signs you know of:	

b. There are different ways to synchronize estrus in pigs. What is synchronization? Why is it done? Give examples of methods. Use **2.3 Key Facts** and any other available resources.

c. In order to manage the reproduction of healthy pigs, record keeping is important. Brainstorm the type of information you think should be included in a pig farmer's records.

d. Strengthen your answers by looking at the sample record keeping forms provided by the trainer.

2. Be ready to share your responses with the class!

2.3 Key Facts[13]

- **Estrus:** when the gilt or sow is sexually receptive. It is commonly referred to as the pig being "**in heat**". On average, a female pig may go into heat every 21 days. The heat cycle is every 18 – 24 days.
- **Gilt:** a female pig under 1 year that has not yet given birth (farrowed).
- **Farrow:** when a pig gives birth
- **Signs of Heat:** Gilts/sow in estrus exhibit certain behaviors and physical signs, which include:
  - Aggressively seeking out a boar
  - Restlessness
  - Vulva swells and reddens

[12] Belstra, B., Flowers, W., See, T. and Singleton, W. (2007, July 31). *Estrus or Heat Detection*. https://porkgateway.org/resource/estrus-or-heat-detection/

[13] Food and Agriculture Organization of the United Nations. (2009). *Farmer's Hand Book on Pig Production*. FAO Nepal.

- Frequent urination and vaginal mucus discharge
- Mounting others or when mounted it stands still
- When pressed on the back by the farmer they stand still (standing reflex)
- White discharge from the genital

- **Mating time**

  - Gilts observed on heat in the morning (AM) should be mated in the evening of the same day (PM).
  - Gilts detected in the evening (PM) should be mated in the morning of the following day (AM). This is what is called the AM – PM rule.
  - Gilt once mated should be brought back for a second mating twelve hours after the first mating

- **Synchronization**:
  - Its ability to precisely control the onset of estrus, especially gilt in puberty and sows
  - It is a practice consisting to induce onset of heat to the sows by using natural methods or reproductive hormones.
  - Being able to control when pigs go into heat and give birth helps farmers manage the flow of pigs in and out of the farm.

Guided Practice Activity

Topic 2.2 Task 3:

1. Read the following scenario and answer questions that follow.

Kabanyana is a farmer from Ngoma sector. Recently she learned from a veterinary technician that it is good to synchronize the breeding of pigs. She is uncertain, however, what this really means and how to do it. She has called upon you to assist her in this process. Your task is to explain to Kabanyana:

a. the meaning and practice of synchronization

b. the signs of heat (estrus) in pigs

c. how to keep record about synchronization

d. how you know when mating is not successful and the sow needs to be re-serviced.

2. Be ready to share your answers with the class!

2.4 Key Facts

- **Return to service:** When mating or achieving pregnancy is not successful, a sow is "returned to service". When a sow starts showing signs of estrus, or heat, that means the mating was not successful. The heat cycle is 18 – 24 days so during that period, the sow can be rebred.

- **Reasons for not conceiving**
  - The sow is too fat
  - It is the animal's first heart cycle
  - The boar is too young.
  - The boar is overworked (used for more than five mating a week).
  - Single mating
  - Diseases
  - Moldy feed (poor feeding)

- The sows which may return to service are identified 18-24 days after the unsuccessful service. This is when she will go back into heat. To confirm this information, they must look at the reproduction record card.

- **The sows which may be synchronized are:**
  - Gilts in puberty
  - Mature gilts
  - Weaned sows

- **Record keeping is very important in managing pig production. There are different types of records to keep:**
  - **Individual sow and boar cards:** date of birth; weight; health information
  - **Reproductive information:** signs of heat, period of estrus; breeding dates; re-servicing dates; farrowing dates; number of piglets born alive and dead; weight of piglets; abnormalities; weaning date
  - **Breeding record card:** date of synchronization; date of planned insemination; date of insemination; semen identification; planned date of farrowing
  - **Health information:** dates and types of immunizations and treatments; illnesses; etc.
  - **Feed consumption:** dates, types, quantities and price of feed given to individual or herds of pigs
  - **Market information:** date, weight, price at which pig was sold

Application Activity

Topic 2.2 Task 4:

1. You are going to visit a nearby local farm where an entrepreneur has a small pig farm. Prepare a list of questions regarding pig production to ask the farmer. For example:
   - How many pigs do you have?
   - How often do you breed them?
   - What breeding techniques do you use? …

2. Visit the pig farm and perform the following tasks:

   a. Interview the farmer, using the questions you wrote down in class.
   b. Identify the sows in heat and write down how you know the sow is in heat.
   c. Ask the farmer to show you which sows were returned in heat and what she or he is going to do next with them.
   d. Identify the sows that may be synchronized.
   e. Ask the farmer to show you the types of records s/he keeps. List them.
   f. Thank the farmer for his/her time and for sharing information about pig production with you.

3. Note down the important points from your workplace exposure experience and prepare a short report (one half page) after the visit.

4. Present and discuss your findings with the rest of the class.

Points to Remember

- The average length of the estrous cycle is 21 days with a range of 18-24 days.
- Heat signs remain for 1-3 days.
- Best time to mate the sow is 12-36 hours (15-24 hours) after onset of heat (standing heat). Second service at 12 hours after the first service is advocated to get higher conception rate and litter size.

Formative Assessment

1. Answer the following questions:

a. What are the signs of heat (estrus) in a sow?

b. Explain when during the day gilts should be mated.

c. What is the importance of practicing synchronization?

d. What type of information should be included in a breeding record card of a sow?

Topic 2.3: Assisting in mating

Key Competencies:

Knowledge	Skills	Attitudes
1. Outline characteristics of productive boar	**1.** Select boar for mating	**1.** Attentive
2. Describe pig breeding methods	**2.** Manage pig mating processes	**2.** Detail oriented
3. State information to be recorded	**3.** Keep reproduction records	**3.** Careful

Getting Started: What do we know and where are we going?

Topic 2.3 Task 1:

1. In a small group, you will share your experiences, observations and knowledge of mating pigs (if you do not have experience, you can use what you have learned from previous activities). Discuss:

a. What characteristics of a boar were considered when selecting a boar to mate with a gilt or sow?

b. What was considered in choosing a gilt/sow to mate?

c. What methods of mating were used?

2. Read and discuss the Key Competencies table.

Problem Solving Activity

Topic 2.3 Task 2:

1. Read the following scenario and answer the questions that follow. You will be assigned a question to report back to the class on.

Karenzi is a pig farmer from Bugesera district. He complains that some of the sows present the signs of heat but he has small boars. As a skilled trainee in pig farming, he invites you to help him to identify a good method of mating in order to maximize the production. To help him, you are requested to:

a. Explain to him the characteristics of a good boar and good gilt or sow for mating.

b. Explain to him the different techniques used in mating.

c. Give advice to Karenzi regarding boar and sow/gilt size when mating.

d. Explain how to keep records of mating.

2.5 Key Facts[14]

- **Physical parameters of boar to mate:**
  - Good body constitution.
  - Size of the boar should be similar to that of the gilt/sow. If a boar is too small, it might not be able to mount the sow properly. If it is too big, the sow will not be able to manage the weight of the boar.
  - Long straight back, deep thighs, strong bones, and full heart girth.
  - Sound feet and legs to be able to hold its own weight during mounting
  - Good looking, non-inverted, and well-placed teats – minimum of 12 teats small.
  - No diseases or body defects like hernia (abdominal, scrotal), atresia, one testicle not descended into the scrotum (Cryptorchidism), blind or inverted nipples, hermaphrodite, small inside toe.
  - Well-developed testicles of equal size.
  - At least 8 months old
- **Physical parameters of a gilt or sow to mate:**
  - A good sow should have at least 12 normal teats.
  - Age of sow for reproduction should not be below 7 months.
  - They should be the biggest and heaviest of the litter.
  - They should have strong legs and walk well.
  - Their parents should be good breeding animals capable of producing good litters at regular intervals.

- **Natural mating** takes places during the act of copulation by the penis. There are two types of natural mating:
  - **Pen breeding:** In pen breeding, a boar is left to run with a group of sows as opposed to keeping the boar in a pen to which sows on heat are brought for service. When using pen breeding divide sows or gilts into groups of 8-10 and one boar be put with each group. It is advisable to rotate boars among groups every 12 -24 hours.

[14] Food and Agriculture Organization of the United Nations. (2009). *Farmer's Hand Book on Pig Production*. FAO Nepal.

- **Hand breeding:** This is where the pig on heat is taken to the boar for service. The boar is kept in a separate pen it has an advantage that it is easy to know the exact breeding date.

- **Artificial insemination (AI):** involves the collection of semen from a boar and then the introduction of semen into a sow or gilt at a later stage by means of a catheter. This contrasts with natural service where a boar mounts a sow and introduces his semen
  - The major advantage of AI is that it allows for the wider use and distribution of boars of high genetic merit. The ejaculate from one boar can be extended to inseminate up to 25 sows

- **Methods of restraining**
  - In pen breeding the boar is put in a pen or enclosed area with 8 – 10 sows/gilts.
  - In hand breeding and artificial insemination, the boar is kept alone in a pen and a sow is brought to the boar.

- **List of parents**: a method based on performance of the parents (ancestors). This requires presence of well-kept records. It is a useful method when the animal to assess is too young or the traits under investigation are sex-linked.

- **The information that should be included on a reproductive card during mating assistance are**:
  - Used Semen
  - Used Boar
  - Date of mating or artificial insemination
  - Planned date of farrowing

Guided Practice Activity

Topic 2.3 Task 3:

1. Still in your groups of 4 or 5 trainees go in pig school farm to perform the following tasks:

a. Select the good boars for mating and write down the reasons.

b. Assist the farmer/trainer in the natural mating of pigs. Depending on the situation at the school farm, this will ideally include pen breeding, hand breeding and artificial insemination. Write down 3 things you have learned from assisting in or observing the process.

c. Assist the school farmer by writing down the key reproduction information reproduction record card. If a card does not exist, create a table in your notebook with the information.

Application Activity

Topic 2.3 Task 4:

1. Form small groups (at least a group of four trainees) and be ready to practice what you have learned at the school farm in a nearby local farm.

2. Visit the pig farm. Each group will be assigned one of the following tasks. When you are not practicing, you should be observing what the other group is doing.

a. Identify the boars for mating.

b. Assist in natural mating and artificial insemination.

c. Record the information in the farmer's reproduction record card or make a table of the necessary information in your notebook.

3. Prepare a report on your observations and practice at the farm. Be prepared to share your main findings with the class.

Points to Remember

Before assisting in the mating process, remember:[15]

- Observe the boars, gilts and sows to make sure they are healthy and have the appropriate characteristics to be mated successfully.
- Gilts/ observed on heat in the morning (AM) should be mated in the evening of the same day (PM)
- Gilts detected in the evening (PM) should be mated in the morning of the following day (AM). This is what is called the AM – PM rule.

[15] Africa Innovations Institute, Kampala, Uganda (April 2016). *Piggery Production Manual: How to Rear Pigs Using Fermented Bed Technology or the Deep Litter System (DLS)*. https://www.afrii.org/wp-content/uploads/2016/11/FINAL-PIGGERY-MANUAL-SENT-RF.pdf

- Gilt once mated should be brought back for a second mating twelve hours after the first mating.
- Keep an accurate record of the date when the sow/gilt was served.
- From day 20 to 21 after service, observe the pig for signs of heat, if no signs are observed the animal is most likely to be pregnant.

Formative Assessment

1. Answer the following questions:

a. Define mating.

b. What is a good moment to mate the sow in heat detected in evening?

c. What does artificial insemination mean?

d. What are physical parameters to consider during the selection of a good boar?

e. Differentiate natural mating from artificial insemination.

Topic 2.4: Monitor pregnancy

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe sign of pregnant sow/gilt	**1.** Perform pregnancy diagnosis	**1.** Conscientious
2. List feed of pregnant sow/gilt	**2.** Feed pregnant sows	**2.** Open minded
3. Describe how to feed a pregnant sow	**3.** Measure feed for pregnant sow	**3.** Attentive

Getting Started: What do we know and where are we going?

Topic 2.4 Task 1:

1. In your group assigned by trainer, share any experience or knowledge you have about pregnant sows. For example:

a. How can you tell the difference between a pregnant sow and one that is not pregnant?

b. How do you care for a pregnant sow?

Problem Solving Activity

Topic 2.4 Task 2:

1. Watch the video (https://www.youtube.com/watch?v=xoW5mwjseqs [16]) shown by the trainer on detecting pregnant pigs.

2. Read the following scenario and answer the questions that follow. Use the information learned from the video as well as from prior topics.

Kabano is a pig farmer from Bugesera district. He is having a hard time determining if his sows are pregnant or not. Within the last three weeks, the sows have been mated several times with the boars. He thinks some pigs may be back in heat while others could be pregnant. Explain to Mr. Kabano how to:

a. Identify the sows which are in heat.

[16] Agri Technology. (2019, March 12). *Pregnancy Diagnosis in Swine* [Video]. Youtube. https://www.youtube.com/watch?v=xoW5mwjseq

b. Identify the sows which are pregnant.

3. Be prepared to share your answers with the class.

4. Read **2.6 Key Facts** with the class and add any new information to your answers.

2.6 Key Facts

- **Gilts/ Sows in estrus exhibit certain behaviors and physical signs, which include**:
  - Aggressively seeking out a boar
  - Restlessness
  - Vulva swells and reddens
  - Frequent urination and vaginal mucus discharge
  - Mounting others or when mounted it stands still
  - When pressed on the back by the farmer they stand still (standing reflex)

- **Keeping reproduction records, looking for external signs and testing with technology (Doppler test, other scanning devices) can help identify pregnancy.**
  - **Doppler (ultrasound test)**[17]

- **The pregnant sows present the following external signs**:
  - The sow does not show any sign of heat 3 weeks after mating (For pregnancy diagnosis, a farmer must observe the vulva and the behavior of female when a boar is present particular at 18-22 days post service.)
  - Increase in body weight
  - Mammary glands develop
  - The skin is smooth and hair coat is shiny
- **The pregnancy will last about 3 months 3 weeks and 3 days.**

[17] Pig333 (n.d.).*Doppler Preg-tector Pregnancy Detector*. https://www.pig333.com/shop/ultrasound-scanners-pregnancy-detectors-and-backfat-scanners_16/doppler-preg-tector-pregnancy-detector_37/

Guided Practice Activity

Topic 2.4 Task 3:

1. Still in your groups of 4 or 5 trainees go to the school pig farm to:

   a. Identify the sows which are in heat and explain why.

   b. Identify the sows which are pregnant and explain how you know.

   c. Find out what is fed to pregnant sows by asking someone who works at the school farm.

2. Read **2.7 Key Facts** to learn more about feeding and water pregnant sows and gilts.

2.7 Key Facts[18]

- Pregnant sows should be fed separately, so that they do not need to compete or fight for feed.
- They need feeds rich into proteins (fish meal/meat meal/oil cakes/soya bean meal), minerals and vitamins.
- Feeds should be reduced in the last part of pregnancy (after 107 days of pregnancy) to avoid constipation. A laxative feed is to be provided at this time i.e. maize bran.
- Pregnant sows drink 10 – 15 litres of water per day. Water should always be available.
- Pregnant sow needs 2.5 kg of feed/day.
- During gestation the sow is limited to 2-3 kg feed per day of a 14% protein diet (sow and weaner meal). Close to farrowing, maize bran may be added as 25% of the feed. It provides the main the source of energy. Maize bran will also increase bulk, and this prevents constipation.
- Inadequate water supply depresses the growth rate of pigs.

[18] Riverina. (2017, September 29). Feeding the Pregnant Sow. http://www.riverina.com.au/feeding-pregnant-sow/

Application Activity

Topic 2.4 Task 4:

1. Form small groups (at least a group of four trainees) and be ready for fieldwork in a nearby local pig farm.

2. Perform the following activities with the assistance and guidance of the farmer:

   a. Determine which sows are still in heat after having been serviced.

   b. Identify the sows which are pregnant.

   c. Note how the pregnant sows are fed and watered.

   d. Assist in feeding and watering of pigs.

3. Write a short report after the visit about your observations and activities at the farm. Be ready to share it with the class.

Points to Remember

- A gilt or sow showing signs of heat is not pregnant and needs to be serviced again by a boar.
- Keeping reproduction records, looking for external signs and testing with technology such as ultrasound can help identify pregnancy.
- A pregnant sow does not show any signs of heat 3 weeks after mating.
- A pregnant sow increases in body weight, develops mammary glands, has smooth skin and a shiny coat of hair.
- A pregnant sow needs 2.5 kg feed / day.
- A pregnant sow needs 10 – 15 litres of water per day and should always have access to water.

Formative Assessment

1. Answer the following questions:

a. How do you detect a sow in heat?

b. What do you consider when determining if a sow is pregnant?

c. What is the required amount of feed and water to distribute to a pregnant sow?

Topic 2.5: Assisting farrowing

Key Competencies:

Knowledge	Skills	Attitudes
1. List signs before farrowing	**1.** Observe physical and behavior change	**1.** Sensitive
2. Describe farrowing process	**2.** Prepare farrowing room and take care of the piglets and farrowed sows	**2.** Patient

Getting Started: What do we know and where are we going?

Topic 2.5 Task 1:

1. Split into small groups of four.

2. You have 10 minutes to discuss and put together their ideas on the questions below.

- **a.** What are the precursor signs of farrowing?
- **b.** What is the duration of pig pregnancy?
- **c.** What are the main farrowing processes?
- **d.** What care is needed by piglets after births?
- **e.** How do you properly care for a farrowed sow?

Problem Solving Activity

Topic 2.5 Task 2:

1. You will be put in a group and assigned one of the following topics:

- **a.** Precursor signs of farrowing
- **b.** Preparing for farrowing
- **c.** Farrowing process
- **d.** Caring for farrowing sows
- **e.** Caring for piglets

2. Your task is to:

a. Find information about your assigned topic from books or pamphlets in the classroom or school library, from searching on the internet, and from reading through **2.8 and 2.9 Key Facts**.

b. Summarise the information and give guidance to Mr Kabano who needs some help.

Kabano is a pig farmer from Gicumbi Dstrict. He has 30 sows, of which he thinks 20 are pregnant. He did not keep good records, however, and is not sure when the sows will farrow. Some of the sows have started to act a bit differently, digging at the bedding on the floor and seeming restless. Mr. Kabano needs help in a lot of things. First, he needs help in identifying the sows that are getting ready to farrow and in preparing the area for farrowing. Then he needs to understand what happens during the farrowing process and how he should care for the sow and piglets.

c. Present the information you find in a creative way to Mr. Kabano and the class.

2.8 Key Facts

- **Precursor signs of farrowing:** includes behaviour changes and physical changes such as:
  - Restless about 24 hours before farrowing
  - Distinct swelling of the vulva
  - The teats are swollen and produce small amounts of milk when pressed
  - The sow begins to dig a hole in the bedding as it builds a nest
  - It lies down and abdominal contractions may be noticed
  - A bloody fluid will come out from the vulva

- **Preparation for farrowing:**[19]
  - Separate the pregnant sow a week before farrowing and keep it in a quiet place
  - Prepare bedding of straw, hay, husk, etc.
  - Gather tools and materials: light, clean water, scalpel and blade, scissors, thread for suture, antibiotic solution, emergency medicines, box for piglets

Guided Practice Activity

Topic 2.5 Task 3:

1. Go to the school pig farm in your group to:

[19] Government of Sikkim. (n.d.). *Piggery Farming*. http://www.sikkim-ahvs.gov.in/Tutorial/English%20Booklets/PIGGERY_BOOKLET.pdf

a. Select the sows showing the early signs just before farrowing
b. Assist the pig farmer in the farrowing process
c. Assist the farmer in taking care the piglets born
d. Assist the farmer in taking care the farrowed sows

2. Write down any key learning points from observing and assisting. Share these with the class.

2.9 Key Facts[20] [21]

- **Farrowing process:**
  - Before farrowing, you shall look at the precursor signs of farrowing.
  - Farrowing takes 4 - 5 hours on average but may be shorter or longer than this.
  - When farrowing, the sow usually lies down and pushes out piglets.
  - Piglets come out with their front feet first or hind legs first. Either is normal.
  - Remove the afterbirth shortly after it is dropped (keep the piglets away from the mother while doing this).
  - Ensure that each piglet has access to a teat to take colostrum (the first milk).
    - Colostrum contains antibodies that give the piglets immunity. This is very essential for piglet survival.
  -
  - After farrowing the sow should be left alone as much as possible.

- **Care for piglets by:**
  - Drying piglets with cloth/towel
  - Cutting umbilical cord
  - Disinfecting umbilical cord with iodine tincture (solution) to prevent infection
  - Feeding piglets by colostrum
  - Eliminating weak piglets or those with defects for equalizing litter.

- **Care for farrowing sows by:**
  - Cleaning the sow
  - Flushing the uterus with antiseptic solution for 2 – 3 days
  - Feeding and watering accordingly

Application Activity

Topic 2.5 Task 4:

[20] Government of Sikkim. (n.d.). *Piggery Farming*. http://www.sikkim-ahvs.gov.in/Tutorial/English%20Booklets/PIGGERY_BOOKLET.pdf
[21] Food and Agriculture Organization of the United Nations. (2009). *Farmer's Hand Book on Pig Production*. FAO Nepal.

1. Form small groups (at least a group of four trainees) and be ready for fieldwork in a local farm where an entrepreneur has a small pig farm.

2. Visit the pig farm, and perform the following tasks:
   a. Identify precursor signs of pregnant sow early to farrow
   b. Prepare the farrowing room
   c. Take care of farrowed piglets
   d. Take care of the farrowing sows

3. Write a short report of your observations and experiences in completing the tasks.

4. Share your key learning pints with the large group.

Points to Remember

- Pregnancy period of pig is 114 days or 3 months 3 weeks 3 days.
- From 111 days to farrowing, observe the sow for signs of parturition (farrowing).
- Prepare the farrowing room.
- Take care of the piglets and their mother.

Formative Assessment

1. Answer the following questions:
   a. What does farrowing mean?
   b. Why is it necessary to remove immediately the piglets from their mother during farrowing?
   c. Why is it necessary to disinfect the umbilical card of newborn piglets?
   d. What term is used to refer to the sow when it is giving birth?
   e. Is it necessary to assist to the pig that is giving birth?

Topic 2.6: Performing weaning

Key Competencies:

Knowledge	Skills	Attitudes
1. Explain how to ease the weaning process for piglets	**1.** Wean piglets	**1.** Sensitive
2. Determine weaning period	**2.** Install weaned piglets	**2.** Observant
3. Describe what to feed and how to install weaning piglets	**3.** Perform transition from milk to dry feed	**3.** Attentive to detail

Getting Started: What do we know and where are we going?

Topic 2.6 Task 1:

1. Split into small groups of four trainees.

2. You will have 10 minutes to discuss and put together ideas on the questions below.

- **a.** What is the term used when you separate babies (animals or human) from their mothers' breastmilk?
- **b.** Describe what you know about the process of weaning a baby from its mother's breastmilk. How does a baby react?
- **c.** What similarities and differences might there be between a human baby getting weaned and a piglet being weaned?
- **d.** If you have had experience weaning pigs or other farm animals from their mothers, describe the process.

3. Share your responses with the class and discuss.

Problem Solving Activity

Topic 2.6 Task 2:

1. Watch the video provided by the trainer on weaning pigs.

2. Split yourselves into small groups of four or five trainees and re-watch the video as needed (trainer will provide link).

3. Use the information in the video to respond to the scenario and questions.

   Kabirizi is a pig farmer from Gicumbi Dstrict. He has sows with piglets of different ages and would like to mate the sows to increase production. He is uncertain about the weaning process and has asked for your advice.

   a. Explain to him how to identify the piglets to be weaned.

   b. Explain to him how to feed piglets before and during weaning.

   c. Explain to him how to install weaned piglets in a new pen.

4. Share your responses with the class.

5. Review **2.10 Key Facts** and ask for any clarification needed.

2.10 Key Facts

Age for weaning

- Early: 3-5 weeks old.
- Late: 6 -8 weeks old.
- Body weight of piglet at weaning: About 15 kg.

Performing weaning

- Under production conditions weaning should not be done early because it requires:
- An expensive diet for the weaners
- High management standards
- Weaning can be a stressful time for piglets, making them more susceptible to sickness. It is important to ease them into the process while providing a familiar and clean environment and starting them on food before weaning.
- To avoid exposing the weaners to undue stress remove the sow from the farrowing pen and leave the piglets in the pen they are used to for some time. Then you can move them to other pens.
- Wean piglets over a period of time such as four days instead of doing it abruptly.
- Do not mix batches of piglets from different sows at the beginning of the weaning phase as this could increase the chances of the piglets getting diseases. Afterwards, they can be sorted by size.

Feeding of piglets[22]

[22] Food and Agriculture Organization of the United Nations. (2009). *Farmer's Hand Book on Pig Production*. FAO Nepal.

- Before weaning, introduce the piglets to small amounts of food so they get used to eating.
- Before 3 weeks old, the piglets are fed **creep feed** of 20% protein. This helps the piglet's digestion system adjust to solid food.
- After 3 to 5 weeks, when piglets are transitioning to weaning, piglets can be given starter feed containing 18% crude proteins. After weaning, they can receive grower feed containing 16% crude proteins.

Alternative practice - Split Weaning:[23]

- At the end of the 5th week remove the piglets that are above average in size from the litter
- Allow the small piglets to suckle for an extra 4 to 5 days
- This gives them a chance to take more milk and add on extra weight
- In any case they should not be allowed to suckle beyond 8 weeks of age.
- Split weaning reduces the intensity of suckling and allows a sow to come back to heat early after weaning.

Guided Practice Activity

Topic 2.6 Task 3:

1. In your groups, go to the pig farm to:

a. Observe the pigs and identify which ones are in the process of getting weaned or are ready to soon be weaned. Write down your observations.

b. Interview the pig farmer about the weaning process. Find out how he plans to install them once weaned and what food he will give to them. Write down the farmers' responses and any observations.

c. Assist the farmer in any of the weaning processes as appropriate: getting food and water ready, putting down bedding in a stall for the newly weaned piglets, etc. Write a few sentences about your experience.

2. Share your observations and learning points with the class.

3. Ask questions for clarification.

[23] Africa Innovations Institute, Kampala, Uganda (April 2016). *Piggery Production Manual: How to Rear Pigs Using Fermented Bed Technology or the Deep Litter System (DLS)*. https://www.afrii.org/wp-content/uploads/2016/11/FINAL-PIGGERY-MANUAL-SENT-RF.pdf

4. Review **2.11 Key Facts** with the class. You should also go back to 1**.1 and 1.3 Key Facts** to remind yourself of the feeding and installing of piglets.

2.11 Key Facts

- **Feeding of weaners**
  - After weaning, the pigs should be switched from the creep feed to a lower cost pig grower feed which contains 16% of crude proteins.
  - Clean fresh water should be available to the pigs at all times
  - Review **1.3 Key Facts** for feed and water amounts
- **Installing weaners (from 1.1 Key Facts)**
  - Follow the following space requirements for growers and fatteners:
  - One weaner piglet occupies 0.55m^2-0.9m^2.
  - 40-45 weaner piglets will occupy one pen, while fattening pigs will require a density of 30 piglets per pen.
    - Weaner is a piglet that has been separated from its mother to become fully mature.
    - Grower is a pig from 30-60 kg or about 3-5 months old.
    - Fattener is a pig from 60-90 or about 5-6 months.
  - Provide feeding where all pigs can eat at the same time.
  - Provide proper ventilation in the pig house and avoid overcrowding.
  - The pens should be regular cleaned.
  - Bathe or spray the animals especially during hot weather (27 degrees).
  - Follow the proper feeding guide based on its nutritional requirements.

Application Activity

Topic 2.6 Task 4:

1. Form small groups (at least a group of four trainees) and be ready for fieldwork in a nearby local farmer where an entrepreneur has a small pig farm (ideally one of the farms the class previously visited).

2. Visit the pig farm and perform the following tasks.

a. Help the farmer identify the piglets to be weaned.

b. Assist the farmer in the preparations needed for installing weaned piglets.

c. Assist the farmer in preparing the dry feed and water for the piglets. Help to feed the piglets as needed.

3. Write a short report of your observations and experiences in completing the tasks. Note anything new you learned or that the farmer did differently than you expected.

4. Share your key learning points with the large group.

Points to Remember

- Weaning is a stressful period for a piglet – emotionally, socially and environmentally. Be aware of this and help make the transition easier.
  - Start giving the piglets small amounts of dry food before they are weaned so their digestive systems get used to it.
  - Remove the sow from the piglets so the piglets remain in a familiar environment at first.
  - Wean piglets over a period of time such as four days instead of doing it abruptly.
- Recommended number of animals in a16m^2 housing unit for weaners is 20-30.
- Before 3 weeks old, the piglets are fed creep feed OF 20%. After 3 to 5 weeks is period of transition of weaning the piglets receive the starter feed containing 18% crude proteins. After weaning they receive weaner feeds called grower feed containing 16% crude proteins.[24]

Formative Assessment

1. Answer the following questions:

a. Define weaning.

b. Why is it important to be attentive to the weaning process?

c. What can be done to make the weaning process go smoothly?

d. Define creeper feed.

[24] Food and Agriculture Organization of the United Nations. (2009). *Farmer's Hand Book on Pig Production*. FAO Nepal.

e. What are recommended dimensions of pen for weaners or grower piglets?

f. How many weaners may occupy one pen without overcrowding?

Self-Reflection

1. You have come to the end of the unit. You are going to do the survey you did at the beginning of the unit again to help you do self-assessment of your knowledge, skills and attitudes.

Again, there are no right or wrong answers to this survey. It is for your own use to gauge your knowledge, skills and attitudes after the unit. Read the Knowledge, Skill or Attitude in the left column. Think about yourself: do you think you can do this? How well? Read the statements across the top. Put a check in column that best represents your situation.

My experience **Knowledge, skills and attitudes**	**I don't have any doing this.**	**I know a little about experience this.**	**I have some experience doing this.**	**I have a lot of experience with this.**	**I am confident in my ability to do this.**
Select boars and sows for breeding					
Check physical appearance and reproductive capacity of sows and boars					
Check health status of sows and boars					
Identify malformations and diseases					
Detect when a sow or gilt is in heat					
Describe how synchronization is done in pig farming					
Synchronize the period of heat for sows/gilts					

My experience Knowledge, skills and attitudes	I don't have any doing this.	I know a little about experience this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
State necessary information to be recorded					
Outline characteristics of a productive boar					
Diagnose a pregnant sow/gilt based on signs					
Feed pregnant sows					
List signs that sow is ready to give birth (farrow)					
Describe farrowing process					
Prepare farrowing room					
Install weaned piglets					
Perform transition from milk to dry feed					
Determine weaning period					
Wean piglets					

2. Reflect on the results of the self-reflection and the work you have done during this unit. Fill in the table below.

Areas of strength	Areas for improvement	Actions to be taken to improve
1. **2.**	**1.** **2.**	**1.** **2.**

Unit 3: Piggery operations

Topics

3.1 Installation of pigs in piggery

3.2 Feeding and watering pigs

3.3 Performing minor surgery

Unit Summary:
In this unit, the trainee will gain the knowledge, skills and attitudes needed in piggery operations. By the end of this unit, the trainee will be able to install pigs in the piggery, feed and water the pigs and perform minor surgery.

Self-Assessment: Unit 3

1. Look at the learning unit illustration. What do you observe? What do you think this unit will be about? What topics might be covered?

2. Fill in the self-assessment below.

There are no rights or wrong ways to answer this assessment. It is for your own use during this unit. Think about yourself: do you think you can do this? How well? Read the statements across the top. Put a check in column that best represents your situation. At the end of this unit, we'll take this assessment again.

My experience **Knowledge, skills and attitudes**	**I don't have any experience doing this.**	**I know a little about this.**	**I have some experience doing this.**	**I have a lot of experience with this.**	**I am confident in my ability to do this.**
Clean piggery					
Identify pigs in accordance to age and physiological status					
Install pigs in piggery					
Identify pig feeds					
Distribute feed and water					
Describe disinfection of surgical material					
Identify surgical material for minor intervention					
Disinfect surgical material					
Explain restraining techniques					
Apply restraining techniques					
Explain the process of castration					

My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Explain the process of caudectomy					
Explain the process of cut teeth					
Keep records					
Perform cutting teeth					
Perform castration					
Perform caudectomy					

Topic 3.1: Installation of pigs in piggery

Key Competencies:

Knowledge	Skills	Attitudes
1. Explain the importance of keeping a piggery clean	**1.** Clean piggery using appropriate disinfectants	**1.** Diligent
2. Identify pigs in accordance to age and physiological status	**2.** Install pigs in piggery according to type of pig and recommended number per 16 m^2	**2.** Attentive to detail

Getting Started: What do we know and where are we going?

Task: Topic 3.1 Task 1:

1. With a group of 4-5 other trainees, discuss the following and put together your ideas on the questions below within 10 minutes.

a. At your home, what do you do if there is presence of spider webs and dustiness in a piggery?

b. Mention the main materials and tools used in cleaning a piggery.

c. What is the importance of cleaning the piggery before installing the pigs?

Problem Solving Activity

Topic 3.1 Task 2:

1. Form small groups.

2. Read carefully the following scenario and discuss the questions.

A farmer has not kept his piggery clean over the last year and now wants to install new pigs. The piggery is very dirty, has a lot of insects and rodents, and smells badly. He was advised to clean the piggery before installing new pigs but is not sure what to

do. He calls you to get information, knowing you are studying pig production at the local TVET school.

a. Give him advice on how to clean his piggery. What procedures should he use?

b. Explain the disinfectants that can be used in cleaning the piggery.

c. Remind the farmer of the different types of pigs according to their age, sex and physiological status so he can better arrange their pens.

3. After 15 minutes, read **3.1 Key Facts**. Supplement the group's answers with the additional information you learn.

4. Share your responses with the large group and discuss.

3.1 Key Facts[25]

- **Cleaning**
  - Pens should be kept free of manure at all times. Cracks in the floor or walls can harbor disease organisms and are difficult to clean so they should be filled.
  - When a group of pigs vacates a pen, it should be cleaned out thoroughly with a pressure hose and brush.
  - Then the walls and floors should be cleaned with 5% washing soda. The pen should then be disinfected with 10% formalin and left un-stocked for one week before new pigs are introduced.
  - The proper use of disinfectants can play a vital role in an effective disease control program for pig units.
- **Procedure:**
  - Remove all portable equipment for cleaning outside the house or pen.
  - Pre-clean the house or pen and equipment to remove all dust and dung/litter.
  - Brush and sweep out the house or pen and remove the sweepings.
  - Thoroughly apply the disinfectant to all surfaces and equipment in the house or pen.
  - Effective disinfection requires surfaces to be thoroughly wet for at least 30 minutes i.e. solution of $KMnO_4$at 1/1000.
- **Common disinfectants**
  - Washing soda (sodium carbonate: Na_2CO_3)
  - Potassium permanganate ($KMnO_4$)
  - Phenol (carbolic acid)
  - Bleaching powder

[25] Williamson, G. and Payne, W. (Eds.). (1999). *An Introduction to Animal Husbandry in the Tropics, 5th Edition*. Wiley-Blackwell.

- Boric acid

- **Review of pigs in different reproductive states:**
  - Future sows: Gilts: young female not yet mated, or not yet farrowed, or after only one litter (depending on local usage). Has not had a litter of piglets, usually up to 6 months.
  - Pregnant gilt/sows: Is a gilt/ sow in gestation or pregnancy a progression of stages from conception to farrowing).
  - Farrowed sows: Sows that gave birth.
  - Boars: Mature male pig able to mate.

Guided Practice Activity

Topic 3.1 Task 3:

1. Form small groups and go to the school pig farm. Perform the following tasks:

a. Clean the piggery using the best practices in **3.1 Key Facts**.

b. Install pigs in piggery. Follow the guidelines on the number of pigs per 16 m^2 found in **3.2 Key Facts**.

c. Categorize the animals according to age, physiological status and reproductive animals. Use the information in **3.2 Key Facts** to do this.

3.2 Key Facts

- **Animal categories according to age and physiological status**:
  - Young piglet: from 1 week to 3 weeks and they weigh about 7 kg.
  - Weaners: 3 weeks to 5 weeks (early weaning or precocious weaning). These piglets may weigh 12 – 15 kg.
  - Weaners from 5 weeks to 8 weeks (later weaning) may weigh 18 kg.
  - Growers: pigs between weaning and sale or transfer to the breeding herd, sold for slaughter or killed for rations. They may weigh 35kg – 60 kg
  - Finishers: grower pigs over 70 kg live weight with 6 months old.
  - Slaughter pig: Young pig ready for slaughter, usually 90-120 kg
  - Gilt/ Boar: Adult pigs of 8 months old and are able to mate (age of puberty) weighing about 70 kg-100 kg.

- Sow: breeding female, or a female pig that has already had after its first litter or second litter of piglets.
- Dry sow: Sows that are not suckling piglets.
- Dam: Mother or female of an animal
- Sire: the boar or father of a piglet.
- Barrow: male pig castrated before puberty.

Recommended number of animals in a 16 m^2 housing unit[26]

Stage of growth	**Number of animals /16 m^2**
Boars	1
Gilts	10
Sows	10
Lactating sows	5
Weaners	20-30
Growers	15-20

Application Activity

Topic 3.1 Task 4:

1. Identify a pig farm in your neighborhood. Fix an appointment with the farmer to observe, ask questions and assist him/her in the cleaning of the piggery.

2. Upon your return, write a short report about what you have observed and learned regarding proper cleaning of a piggery. Include the following:

   a. What procedures were used in cleaning the piggery?

   b. What types of disinfectants were used to clean the piggery?

[26] Africa Innovations Institute, Kampala, Uganda (April 2016). *Piggery Production Manual: How to Rear Pigs Using Fermented Bed Technology or the Deep Litter System (DLS)*. https://www.afrii.org/wp-content/uploads/2016/11/FINAL-PIGGERY-MANUAL-SENT-RF.pdf

c. What types of pigs did the farmer have? (e.g. boars, pregnant sows, etc.)

d. How were the pigs housed – how many pigs per $16m^2$ for each type of pig?

Points to Remember

- Keep pens clean of manure.
- Use disinfectants in cleaning piggery to help prevent disease.
- Recommended number of animals in a 16 m^2 housing unit[27]

Stage of growth	**Number of animals /16 m^2**
Boars	1
Gilts	10
Sows	10
Lactating sows	5
Weaners	20-30
Growers	15-20

Formative Assessment

1. Describe the process of cleaning a piggery.

2. List three disinfectants used in practicing hygiene of a piggery.

3. Calculate the surface area that can hold 30 gilts.

[27] Africa Innovations Institute, Kampala, Uganda (April 2016). *Piggery Production Manual: How to Rear Pigs Using Fermented Bed Technology or the Deep Litter System (DLS)*. https://www.afrii.org/wp-content/uploads/2016/11/FINAL-PIGGERY-MANUAL-SENT-RF.pdf

Topic 3.2: Feed and and provide water to the pigs

Key Competencies:

Knowledge	Skills	Attitudes
1. Identify pig feeds	**1.** Weigh pig feeds	**1.** Attention to detail
2. Identify types of information to record	**2.** Clean drinkers and feeders	**2.** Thorough
3. Outline how feed and water are distributed	**3.** Distribute feeds and water	**3.** Precise

Getting Started: What do we know and where are we going?

Topic 3.1 Task1:

1. Split into pairs. Based on what you have learned in Unit 1 on feeding and what you have observed during visits to pig farms, answer the following questions.

a. What types of food do pigs eat?

b. How much water and food should pigs be given?

c. What type of information should be recorded regarding feeding?

Problem Solving Activity

Topic 3.2 Task 2:

1. Form small groups of 4 to 5 trainees. You will be assigned one of the following categories: energy, proteins, minerals, vitamins.

a. List examples of foods you can give a pig for your assigned category on a blank sheet of paper (flipchart if available).

b. After 5 minutes, you will move to the next group's paper and add any additional foods.

c. Continue the process until you have finished with each food group.

2. Read **3.3 Key Facts** with the class and discuss. Ask the trainer for any clarifications.

3.3 Key Facts[28] [29]

- A simple classification of livestock feed groups is into roughages, concentrates, and feed supplements.
  - **Roughage:** Bulky feeds with high fiber content (›18% crude fiber) and low in digestible energy (TDN ‹65%). They include straws and stoves, pastures (grasses and legumes), silage, hay and tree leaves.
  - **Concentrates:** are the feeds which are high in energy (TDN›70%), low in crude fiber (‹18%) and contain less than 20% crude proteins. These feeds are reserved for animal maintenance, growing and productions.
  - **Feeds supplement**: are the feeds that are used to supplement nutrients such as proteins, minerals and vitamins including premix.
- **Ingredients providing energy, proteins, mineral and vitamins are:**
  - **Energy**:
    - Maize, sorghum millet, wheat maize bran, wheat bran, rice bran, cassava, sweet potatoes, lard, extra-oil, molasses, banana, avocado, pineapple
  - **Proteins:**
    - Fish, blood meal, poultry and fish processing wastes, soybeans, beans, groundnuts
    - Cotton seed cake, sunflower seed cake
  - **Mineral**:
    - Bone ash, common salt, brown salt, soil and commercial vitamin-mineral premix. Bone meal, oyster shell and limestone are the most common sources of Calcium and Phosphorus in pig rations
  - **Vitamins**:
    - Green leaves and vegetables+ synthetic vitamins

Guided Practice Activity

Topic 3.2 Task 3:

[28] Deka, R. and Wright, I. (July 2011). *Training Manual on Smallholders' Pig Management*. ILRI Asia Office. https://cgspace.cgiar.org/bitstream/handle/10568/12533/TrainigManual_Pig.pdf?sequence=1

[29] Africa Innovations Institute, Kampala, Uganda (April 2016). *Piggery Production Manual: How to Rear Pigs Using Fermented Bed Technology or the Deep Litter System (DLS)*. https://www.afrii.org/wp-content/uploads/2016/11/FINAL-PIGGERY-MANUAL-SENT-RF.pdf

1. Form five small groups. Each group will be assigned a topic – creep feed, weaner feed, grower feed, finisher weed and watering. Your task is to:

   a. Read **3.5 Key Facts** with your group. Make sure you understand the information specific to your assigned topic.

   b. Brainstorm ingredients you can feed pigs that will provide the following nutrients
      i. Energy
      ii. Proteins
      iii. Minerals
      iv. Vitamins

2. Visit the school pig farm with your class.

   a. Mix and store the available ingredients

   b. Clean the feeders and drinkers

   c. Distribute feeds and water according to the type of pig. Each group will be responsible for their assigned topic. For example, if the pigs are weaners, the weaner group will lead the feeding of the weaners.

   d. Keep a record of what you feed the pigs and how much water you give.

3.5 Key Facts[30] [31]

- Feeding pigs:
  - Feed intake should be between 0.5 to 3kg depending on age, weight and environmental temperature.
  - Pigs need different types of feeds as they develop because their nutritional needs vary with stage of production.
- There are four types of feeds:
  - **Creep feed:** It is introduced to piglets from the third week up to 8 weeks when they are weaned. It is given to supplement sow milk.
    - It must be high in protein (20-22%), and high digestible.
  - **Weaner feed:** This is fed to pigs after weaning from 2-4 months. It contains 14-20 % crude proteins.

[30] Deka, R. and Wright, I. (July 2011). *Training Manual on Smallholders' Pig Management*. ILRI Asia Office. https://cgspace.cgiar.org/bitstream/handle/10568/12533/TrainigManual_Pig.pdf?sequence=1

[31] Africa Innovations Institute, Kampala, Uganda (April 2016). *Piggery Production Manual: How to Rear Pigs Using Fermented Bed Technology or the Deep Litter System (DLS)*. https://www.afrii.org/wp-content/uploads/2016/11/FINAL-PIGGERY-MANUAL-SENT-RF.pdf

- **Grower feed:** It is feed to pigs that are between 4 -6 months. It is given to breeding animals (gilt, sows and boars). It contains 14-16 % crude proteins.
- **Finisher feed or finisher meal:** It is given to animals after 6 months. It contains 11-13% crude proteins.

- Watering pigs:
  - Pig should have free and convenient access to water, beginning before weaning. The amount of water required varies with age, type of feed, environmental temperature, status of lactation, fever, high urinary output or diarrhea. Normally, growing pigs consume 2-3 kg of water for every kg of dry feed.
  - Lactating sows consume more water because of high water content of the milk that they produce.
  - Water restriction reduces performance and milk production and may result in death if the restriction is severe.
  - Daily water requirements in liters:

Class of pig	**Daily water requirements in liters**
Pigs up to 10 kg	1.2 -1.5
Pigs from 11-25 kg	2.3-2.5
Pigs from 26-50 kg	3-5
Pigs from 51-120 kg	6-8
Boars	5-10
Replacement gilts	5-8
Pregnant sow or gilt	5-10
Lactating sow	15-50

Application Activity

Topic 3.2 Task 5:

1. Choose one or more pig farms in their neighborhood, fix an appointment with farmer and ask permission to assist in the feeding and watering of the pigs. Explain to the farmer that you would like to observe and assist in:

   a. Selecting the food that has the appropriate nutrients for the pigs,

   b. Weighing the feeds and mixing them,

   c. Cleaning drinkers and feeders,

d. Distributing the feed and water, and

e. Filling the pig farmer's record card.

2. Write a short report that describes your observations and experience in doing the tasks listed above.

3. Share your main learning points gained from the workplace with the rest of the class. Listen to what their experiences were like too and ask questions.

Points to Remember

- **Feeding recommendations for pigs:**
  - Newborn piglet: feed colostrum from 1 to 4 days old.
  - Piglets: Creep feed (pellets food) or milk replacer until 7-8 weeks of age.
  - Growing pigs: Feed 2-3kg per day depending on age, genetics, body weight and environmental temperature.
  - Lactating sows: Feed from 5 kg at farrowing building on body weight, litter size and environmental temperature. When this lactating sow is allowed to access to the pasture or fiber, feed 1.5 to 2kg plus 0.25kg per piglet per day.
  - Boar: Feed approximately 2kg.
  - Dry sows: Feed 2-2.5 kg.
  - Dry sows and boars: Feed 1 to 1.5 kg per day while allowing access to pasture or other fiber.
  - Ensure access to fresh, clean water at all times.

Formative Assessment

Answer the following questions:

1. State the amount of feeds reserved for:

   a. Boar
   b. Growers
   c. Lactating sow

2. Give examples of foods that can be fed to pig to ensure they get the following nutrients:

a. Protein
b. Energy
c. Vitamins

3. True or False: Pigs should have access to water only during feeding times.

Topic 3.3: Perform minor surgery

Key Competencies:

Knowledge	Skills	Attitudes
1. Describe disinfection of surgical material	**1.** Identify and disinfect surgical materials for minor intervention	**1.** Analytical
2. Explain restraining techniques	**2.** Apply restraining techniques	**2.** Assertive
3. Explain the process of castration, caudectomy and cut teeth	**3.** Perform castration, caudectomy and cut teeth	**3.** Precise

Getting Started: What do we know and where are we going?

Topic 3.3 Task 1:

1. With a partner, share what you know about:

- **a.** Minor surgeries performed on pigs when they are no more than 2 weeks old.
- **b.** They type of instruments that are used in the surgeries.
- **c.** How you prepare and disinfect the instruments.

Problem Solving Activity

Topic 3.3 Task 2:

1. Form small groups of 4 to 5 trainees. With your group, you are going to move around the room to different learning stations – castration, tail docking and teeth clipping. At each station, perform the following tasks:

- **a.** Watch the video that demonstrates the procedure being done.
- **b.** Look at the pictures/posters provided and discuss what you see.
- **c.** Read any information provided at the station.

2. Read the following scenario, and based on what you learned at the learning stations, give Ms. GAKUBA some advice.

GAKUBA is pig farmer residing in Gatsibo District. She raises pigs for meat. A few days ago when she was distributing the feed to the pigs, she noticed that some of the piglets had injured tails. She also noticed that several of the lactating sows had wounds on their teats. As a skilled trainee in pig farming you have been called in to help.

a. Explain what needs to be done to prevent injuries to the tails of piglets and the teats of lactating sows.
b. Describe the procedures that need to be done to Ms. GAUKUBA's piglets.
c. Explain the importance of disinfecting surgical tools before and after procedures are done.
d. Explain the tools that will be needed to perform the procedures.

3. Read **3.6** and **3.7 Key Facts**.

3.6 Key Facts

- **Perform minor surgery**

  - **Material to use for castrating the pig:**
    - Clean knife, scalpel or razor blade, disinfectants, antiseptics, antibiotics and gauze.
  - **Material to use for caudectomy (Tail docking):**
    - Surgical scissors stainless.
  - **Material to use for cutting teeth/teeth trimming/canine clipping/teeth clipping**:
    - Pair of tooth clippers, or pliers or forceps.

Guided Practice Activity

Topic 3.3 Task 3:

1. Divide into 3 groups and go to the school pig farm.

2. Your task is to:
a. Help the farmer get the pigs ready for castrating, tail docking and teeth clipping by separating the pigs, selecting the tools needed, disinfecting the tools and anything else the farmer instructs.

b. Observe the surgical procedures being performed by the pig farmer and trainer. One group at a time will be asked to assist as needed.

3. Share your observations and key learning points with the class. Ask questions for clarification on any of the procedures.

4. Refer to **3.7 Key Facts** to review the steps of the surgical procedures.

3.7 Key Facts

Surgical operations

- **Castrating the piglet**
  - Castration is the removal of the testicles from the male pig. It is typically done within the first seven days after birth.
  - Why castration? To reduce aggression and the bad taste and odor of meat due to boar hormones.
  - You will need a very sharp, clean knife, scalpel or razor blade. Remove the sow from the litter and if possible, put her where she cannot see or hear them.
  - **Procedure:**

    "Step 1: Wash and wipe the scrotum with a disinfectant.
    Step 2: 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.
    Step 3: Pull the testicle out, so that the attached cord is also pulled to the outside.
    Step 4: Hold the exposed testicle with the left hand while the cord is twisted twice.
    Step 5: 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.
    Step 6: Afterwards wash the wounds thoroughly with a disinfectant like iodine to prevent infection. The other testicle is removed in the same way." [32]

- **Cut tail/Tail Docking (caudectomy)**
  - It involves cutting off the tail to leave a small piece about ½ inch.
  - It helps to prevent tail biting.
  - Tail biting can lead to injury and infection.
  - Tail docking should be done within the first 4-7 days after birth because:
    - The piglet is small and easy to hold
    - At this age other piglets are less likely to bite a newly docked tail
    - The pig is well protected with antibodies obtained from colostrum
  - **Procedure:**

[32] Food and Agriculture Organization of the United Nations. (2009). *Farmer's Hand Book on Pig Production*. FAO Nepal.

- Hold the piglet suspended by the rear legs with one hand
- Using a sharp sterile knife cut off the tail to leave ½ inch from the place where the tail joins the body
- Disinfect the wound.
- Disinfect the knife after working with each litter of piglets.

- **Teeth trimming/ canine clipping**
  - It is usually necessary to trim the piglets' teeth to prevent them biting the mother sow's udder.
  - Typically done at 3 – 4 days of age.
  - "The piglets are born with needle sharp teeth which may injure the sow's udder and prevent the sow from letting the piglets suckle. The piglets would then be left to starve. Only the points of the teeth should be removed. If any more is removed there is a risk of damaging the mouth. When trimming the teeth, the tongue of the piglets should be rolled back to avoid injuring it."[33]
  - **Procedure:**
    - Restrain the piglet by grasping the head with one hand.
    - Force the mouth open using fingers on the same hand near the back edges of the mouth. Be careful that you do not choke the piglet.
    - Use sharp pliers taking care not to injure the gums. Hold the clippers as perpendicular as possible to the teeth
    - Completely cut off the teeth as close to the gum as possible
    - After clipping the teeth on one side turn the pig to give access to the teeth on the other side of the head.
    - Clean the pliers with a disinfectant after working with each litter of piglets.

Application Activity

Topic 3.3 Task 4:

1. Read the following scenario and act accordingly.

Kamuzinzi is a farmer living near your school pig farm, and he calls you as a learner skilled in pig production to help him to perform surgical operations on his piglets. You are asked to:

a. Select surgical materials to perform:
- Castration to the piglets
- Caudectomy (tail docking)
- Cutting teeth

[33] Food and Agriculture Organization of the United Nations. (2009). *Farmer's Hand Book on Pig Production*. FAO Nepal.

b. Explain, step by step, the procedures used to perform each of the surgeries above.

Points to Remember

- Young pigs should be castrated at 2 to 3 weeks of age.
- For performing caudectomy, the piglets should be at 4-7 days old.
- The piglet's teeth should be cut as soon as possible after its birth. The teeth can be cut when the pig is only 15 minutes old. Normally the teeth trimming is done when the piglets are 3-4 days old.

Formative Assessment

1. Answer the following questions:

a. List the materials to be used when performing castration of pigs.

b. Why are the teeth of piglets clipped?

c. Why are male pigs castrated?

Self-Reflection

1. You have come to the end of the unit. You are going to do the survey you did at the beginning of the unit again to help you do self-assessment of your knowledge, skills and attitudes.

Again, there are no right or wrong answers to this survey. It is for your own use to gauge your knowledge, skills and attitudes after the unit. Read the Knowledge, Skill or Attitude in the left column. Think about yourself: do you think you can do this? How well? Read the statements across the top. Put a check in column that best represents your situation

My experience / **Knowledge, skills and attitudes**	**I don't have any experience doing this.**	**I know a little about this.**	**I have some experience doing this.**	**I have a lot of experience with this.**	**I am confident in my ability to do this.**
Clean piggery					

My experience Knowledge, skills and attitudes	I don't have any experience doing this.	I know a little about this.	I have some experience doing this.	I have a lot of experience with this.	I am confident in my ability to do this.
Identify pigs in accordance to age and physiological status					
Install pigs in piggery					
Identify pig feeds					
Distribute feed and water					
Describe disinfection of surgical material					
Identify surgical material for minor intervention					
Disinfect surgical material					
Explain restraining techniques					
Apply restraining techniques					
Explain the process of castration					
Explain the process of caudectomy					
Explain the process of cut teeth					
Keep records					
Perform cutting teeth					
Perform castration					
Perform caudectomy					

2. Reflect on the results of the self-reflection and the work you have done during this unit. Fill in the table below.

Areas of strength	Areas for improvement	Actions to be taken to improve
1. **2.**	**1.** **2.**	**1.** **2.**

REFERENCES

Africa Innovations Institute, Kampala, Uganda (April 2016). *Piggery Production Manual: How to Rear Pigs Using Fermented Bed Technology or the Deep Litter System (DLS)*. https://www.afrii.org/wp-content/uploads/2016/11/FINAL-PIGGERY-MANUAL-SENT-RF.pdf (https://www.afrii.org/wp-content/uploads/2016/11/FINAL-PIGGERY-MANUAL-SENT-RF.pdf)

Agri Technology. (2019, March 12). *Pregnancy Diagnosis in Swine* [Video]. Youtube. https://www.youtube.com/watch?v=xoW5mwjseq

Belstra, B., Flowers, W., See, T. and Singleton, W. (2007, July 31). *Estrus or Heat Detection*. https://porkgateway.org/resource/estrus-or-heat-detection/

Carr Consulting. (n.d.). *Diseases of the Gilt and Young Boar*. http://www.carrsconsulting.com/thepig/disorders/diseasebysystem/diseasesgilts.htm

Deka, R. and Wright, I. (July 2011). *Training Manual on Smallholders' Pig Management*. ILRI Asia Office. https://cgspace.cgiar.org/bitstream/handle/10568/12533/TrainigManual_Pig.pdf?sequence=1

Food and Agriculture Organization of the United Nations. (2009). *Farmer's Hand Book on Pig Production*. FAO Nepal. http://www.fao.org/ag/againfo/themes/documents/pigs/Handbook%20on%20Pig%20Production_English%20layout-Vietanm-Draft.pdf

Irekhore, O. (May 2012*). General Overview of Pig Production, Enterprise Selection and Establishment*. https://www.scribd.com/document/240299980/Pig-Production-Training-Manual-Original

Linden, J. (2013, May 23). *Effective Heat Detection* at the The Pig Site. Copyright *© thepigsite.com/ - Reproduced with Permission(permission granted for nonprofit making organisations). https://thepigsite.com/articles/effective-heat-detection*

Pig333 (n.d.).*Doppler Preg-tector Pregnancy Detector*. https://www.pig333.com/shop/ultrasound-scanners-pregnancy-detectors-and-backfat-scanners_16/doppler-preg-tector-pregnancy-detector_37/

Pig333 (n.d.). *Impaired Motility in Newborn Piglet – Atlas of Swine Pathology*. https://www.pig333.com/pathology-atlas/impaired-motility-in-newborn-piglet_204

Riverina. (2017, September 29). Feeding the Pregnant Sow. http://www.riverina.com.au/feeding-pregnant-sow/

University of Minnesota: College of Veterinary Medicine, Minnesota Veterinary Anatomy Courseware Web Site (January 2020). *Veterinary Anomalies: Musculoskeletal – Image 5*. http://vanat.cvm.umn.edu/vetAnomal/sysMS/MS5.html

Williamson, G. and Payne, W. (Eds.). (1999). *An Introduction to Animal Husbandry in the Tropics, 5th Edition*. Wiley-Blackwell.

This publication is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this are the sole responsibility of Education Development Center (EDC) and do not necessarily reflect the views of USAID or the United States Government.

RWANDA POLYTECHNIC – RP

P. O. BOX 164 Kigali Rwanda

info@RP.gov.rw

www.RP.gov.rw