

Value Chain Alliance for Livestock Upgrading and Empowerment



Training Manual on Pig Genetics, Breed Selection, and Caring of Breeding Stock



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1. INTRODUCTION

Productivity and profitability of a pig enterprise is determined by the genetic potential of pigs, among others. It is the combination of genetics, nutrition, health, environment, and management that influences quantitative traits which are of economic importance such as litter size, growth rates and carcass quality. Breeding stock should be selected from large, healthy, and problem-free litters. Breeding and mating in pig production determine the genetic background of the pigs in the enterprise and thus play an important role in performance and meat quality. Since the genetics of a pig plays an important role in its performance and meat quality, all pig producers should be familiar with breeding systems. This training manual is intended to serve as a guide for the trainers so that they provide the necessary and relevant training methodologies and techniques to enable the value chain members in the pork value chain to understand how to breed and take care of breeding stock.

2. INFORMATION AND INSTRUCTIONS TO THE TRAINER

This manual should be used purely as a facilitator's guide. The sessions under each module are presented with an outcome(s) to facilitate the assessment of participants' understanding and depth of knowledge at the end of each session. Following the outcome(s) are the topics to be covered and facilitating methodology. However, the facilitator should feel free to adapt the methodology suggested to the needs of participants. To enhance a participatory learning process, some methods of presentation and the steps to follow are therefore outlined. The manual also provides some background information on each session. The information is also meant to aid the facilitator in the preparation for the session. Like all participatory methods, the involvement of the participants in all stages of the learning process is vital. However, all users of this manual must study and research into the content of each module before the presentation. Start each sub-topic and group activity by explaining the objective and learning outcomes expected of them, and ensure they are met. Though contents for each sub-topic are provided, lead the participants into giving their points, copy them in the flip chart/whiteboard/chalkboard, some of their points will or may coincide with the contents in this Module, and then mention to them the items of sub-topics that were not pointed out by them.

The session should be interactive, participatory, lively, and interesting. Let the participants express themselves in vernacular Language for them to understand the concepts. Encourage them to ask questions especially on concepts that they do not understand. Switch to either English or vernacular language when you find some or all of them do not understand you in one of the languages.

Start the session with greetings, welcoming remarks, and introduce yourself. Ensure you have the necessary, materials, stationery, and equipment for the trainees: projector, flip charts or whiteboard, whiteboard markers, marking pens, and handouts. Be time conscious as you facilitate the session.

3

PIG GENETICS, BREED SELECTION, BREEDING AND CARING OF BREEDING STOCK



3. PIG GENETICS, BREED SELECTION, BREEDING AND CARING OF BREEDING STOCK

LEARNING OUTCOMES

By the end of this module, farmers should be able to:

1. Explain the purpose and objectives of pig breeding.
2. Explain the caring of breeding stock.
3. Describe ideal characteristics of breeding stock.
4. Describe the selection of breeding stock.
5. Outline the breeding soundness evaluation.
6. Explain breeding systems.

3.1 BREEDS, SELECTION, CARE AND MANAGEMENT OF BREEDING STOCK

3.1.1 Mukota



Figure 3.1 - Mukota breed

- Mukota pigs are hardy and well-adapted to the harsh tropical environment in Zimbabwe.
- They are black without any shades or spots.
- They are tolerant of high temperatures, disease, and poor nutrition.
- Naturally, Mukota has a selective advantage to survive and reproduce on a low plane of nutrition, that is feeds with low protein and energy.
- Water consumption is also very low, and a litter can survive on 6 litres weekly.
- The breed can thrive on high fibrous diets compared to other pig breeds due to an enlarged caecum, where significant hind-gut fermentation occurs.
- The breed can easily survive under very unhygienic conditions testifying to their high disease resistance.
- The carcass yields are about 30 % less than that of the Large White.
- Poor growth rate, early maturing, and deposition of fat
- Poor litter size but highly fertile

3.1.2 Large white



Figure 3.2 - Large White breed

- It is a large breed, white in colour, has a dished face and erect pink ears.
- It is a rugged and hardy breed that can adapt to variations in climate and other harsh environmental factors.
- They can cross with and improve other breeds and hence have obtained a leading role in commercial pig production systems and breeding pyramids around the world.
- The sows are known for having excellent maternal instincts, large litters and for heavy milk production.
- The average live weight of mature boars is 350 –380 kg and sows is 260 – 300 kg.
- They have strong legs.

3.1.3 Landrace



Figure 3.3 - Landrace breed

- They are white with ears that droop and slant forward and its top ends nearly parallel to the bridge of a straight nose.
- The breed is noted for its ability to farrow and raise large litters, on average 11 and have a high weaning percentage (good mothers).
- Landrace is known for its long body, a high percentage of carcass weight in the ham and loin, and an ideal amount of finish.
- It is noted for its ability to cross well with other breeds.
- The average live weight of mature boars is 310 – 400 kg and sows are 250 – 330 kg.
- Legs are not as strong as Large white and its easily stressed

3.1.4 Duroc



Figure 3.4 - Duroc breed

- Duroc is rusty red in colour.
- It has partially drooping ears and is large.
- The breed produces average litter sizes and has the ability to grow quickly.
- The breed has a deep body, broad ham and shoulder, and quiet disposition.
- The meat produces high levels of tenderness.
- The average live weight of mature boars is 300kg and a sow is 250kg.
- Normally used as a terminal sire.
- The meat has intra-muscular fat so it is juicy.
- They have low temperament.

3.2 Selection of breeding stock

3.2.1 Age of selection

Selection is done between 5-6 months.

3.2.2 Traits of economic importance

Traits of economic importance include the following;

- Growth rate
- Feed Conversion Efficiency
- Litter size
- Carcass quality
- Body conformation

3.2.3 Selection of breeding boars



Figure 3.6 - Boar

- Selection starts at 5-6 months of age and boars should be at least 7 months of age to be evaluated for breeding.
- Libido should be high as exhibited by the boar showing a desire to mate.
- The boar must have the ability to mount correctly without showing signs of lameness, injury or arthritis.
- The penis must be of normal size and condition.
- Boars with penis hereditary genetic defects such as tied or adhered penis, limp penis, infantile penis and coiling of the penis in the diverticulum should be culled.
- Soundness evaluation can be confirmed by breeding two or three gilts and carefully check whether they return to estrus
- Normal testicular size and shape.
- Should have good strong legs
- The legs should neither be X nor O shaped,
- Should be well-muscled and wedge shaped.
- Should not have genetic defects.

- Should have high growth rate
- Should reach 90 kg of live weight before 140 days old.
- Boar should have at least 14 properly placed rudimentary teats so as to pass on this characteristics to offspring.

3.2.4 Gilt selection



Figure 3.7 - Gilt

- Selection of gilts starts at 5-6 months. Pre-selection can be done at weaning.
- Select breeding gilts from sows that produce large litters (> 10), with above-average growth rate, and carcasses with low-fat content.
- Gilt should have at least 14 well-spaced functional teats (blind or inverted teats should be avoided).
- As with boars the legs should be strong, straight, with large, even-sized claws and well-developed body and thigh muscles.
- Besides, gilts should be able to walk straight and stand up on their claws without falling over at the pastern joints just above the foot.
- They should also have well-developed ham, good length with light shoulders and head.
- Avoid using females with genetic defects like inverted nipples and upturned vulvas

3.3 FACTORS TO CONSIDER WHEN BUYING BREEDING STOCK

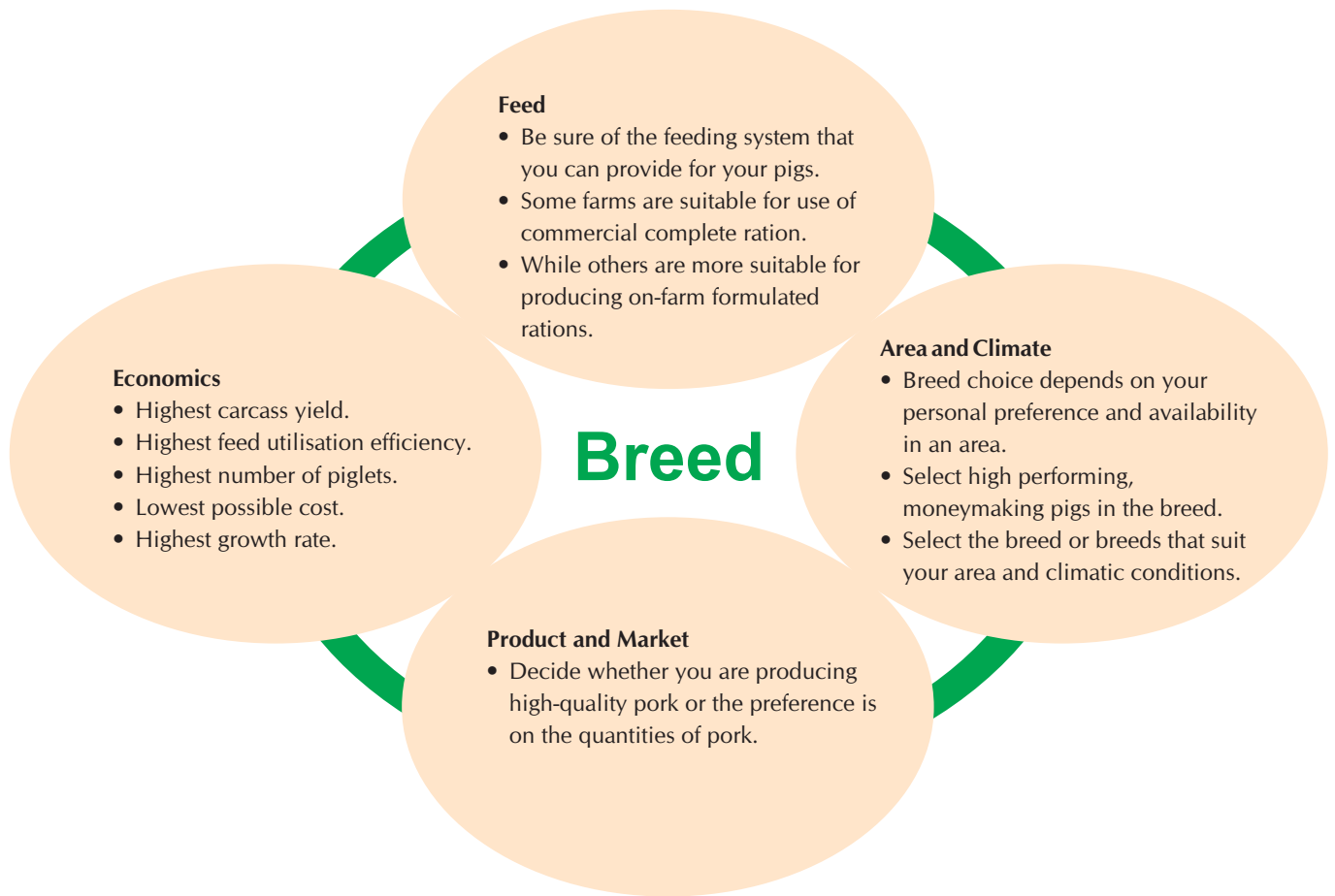


Figure 3.5 - Factors to consider when buying breeding stock

3.4 Breeding Systems

Pig breeding involves the pairing of a boar and a sow or gilt to maintain or improve desired traits.

3.4.1 Pure-breeding

- Mating purebred individuals of the same breed but from different breed lines..
- The major objective of pure-breeding is to identify and propagate superior genes for use in commercial production primarily in crossbreeding programs.
- Pure-breeding as well propagates and identifies superior females.

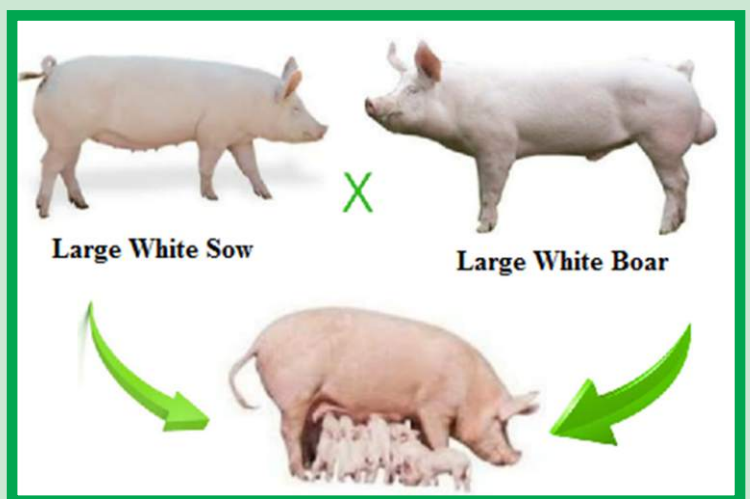


Figure 3.20 - Pure breeding

3.4.2 Out-breeding

- Mating individuals of the same breed but who are less closely related than the average of the breed.
- There should not be a common ancestor for at least four generations back in the pedigree of the boar and the females with which he is mated.
- It is a useful mating system in purebred individuals.

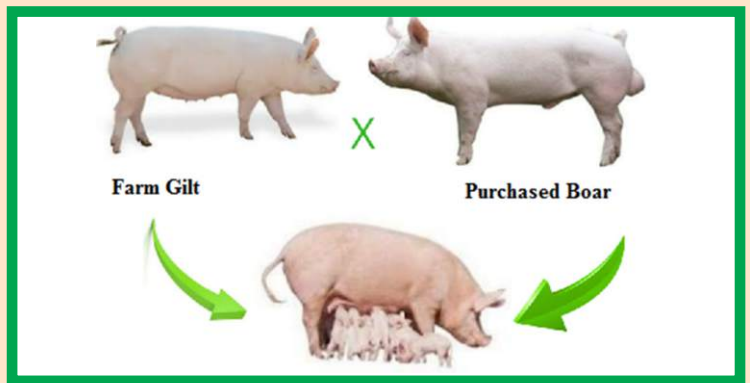


Figure 3.21 - Out-breeding

3.4.3 In-breeding

- Mating between individuals of the same breed but which are more closely related than the average of the breed.
- This could be between as close individuals as full sibs or sire-daughter, mother-son.
- Pure breeding is a special kind of inbreeding.
- The effect of inbreeding is the concentration of common genes in the offspring.
- Many undesirable traits e.g. hernia and cryptorchidism involve recessive genes thus inbreeding perpetuates their expression phenotypically.
- Inbreeding causes a decrease in litter size and increases mortality.
- Inbred sows are inferior in milking and mothering ability.
- It also delays sexual maturity in gilts and boars.
- Inbred boars have less sexual libido. Inbred gilts have fewer eggs during oestrus and farrow smaller litters than those out-bred.

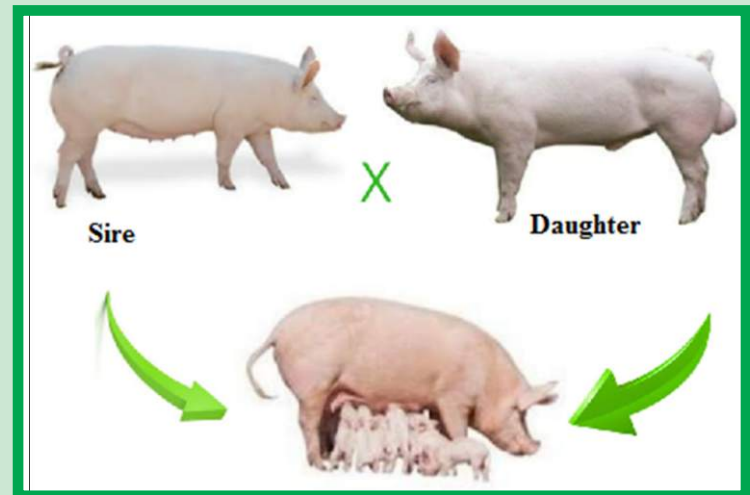


Figure 3.22 - Inbreeding

3.4.4 Crossbreeding

- Mating two individuals from different breeds thus introducing into the progeny a gene combination that is different from that existing in either parent or the breed of either parent.
- Crossbreeding can involve two or more breeds, depending on the desired result.
- The sole purpose of cross-breeding is to take advantage of the observed improvement in the performance of the progeny above that of either parent - hybrid vigour or heterosis.
- Breed improvement is important in obtaining improved and high yielding pigs.
- The main purpose of breed improvement is to introduce a positive characteristic to a local breed.
- Crossbreeding an indigenous Mukota sow with an exotic boar; the offspring is likely to inherit the body shape and good growth rate from the sire.
- The offspring is expected to inherit the tolerance to environmental stress from its dam.

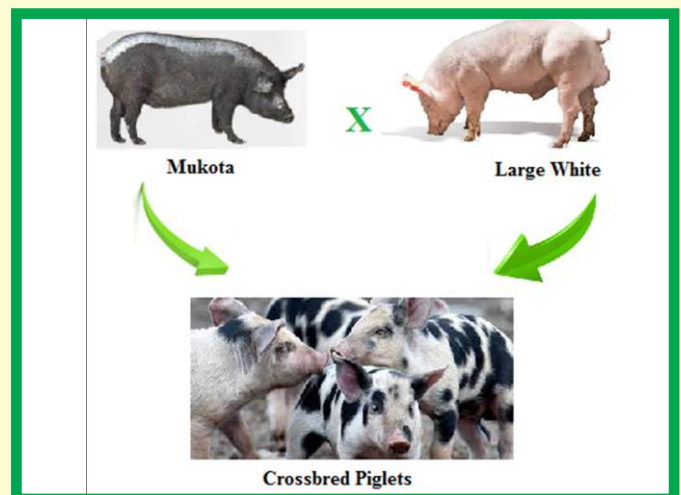


Figure 3.23 - Cross breeding
Crosses between Mukota and exotic for improvement of the local breed

3.4 Care and Management of Breeding Stock

3.4.1 Gilt

- Selection of replacement breeding stock is done at every stage of production.
- At the end of the breeding soundness evaluation, the energy intake of selected gilts should be restricted to prevent overweight conditions.
- Daily exposures to a rotation of mature, high libido boars maximize the response to boar exposure to influence puberty attainment from between 160 and 180 days of age.
- The cumulative effect of poor management of the gilt prior to service limits the ability of sows to produce big litters in successive parities.
- It is recommended that gilts be bred at a target weight of around 130kg.
- From 130 kg to first service - a high nutrient intake is required to achieve a flushing effect before mating.
- Physiological age at breeding rather than age in days, is an important criterion for determining the time of mating in gilts.
- Breeding should be delayed until the second or third estrus to increase the probability of large litters and prevent dystocia.
- Mating to late pregnancy - a steady increase in maternal body weight should be maintained.
- Gilts that do not conceive after mating at two estrous periods should be culled.
- Likewise, gilts that have not expressed heat by 9 months of age should be culled.
- During gestation, gilts should be fed to gain about 34 kg and not become too fat.

3.4.2 Boar

- High priority should be given to the management of a newly introduced boar into the breeding herd to achieve maximum reproductive efficiency.
- Good reproductive and nutritional management pays dividends through an increased number of live pigs farrowed and subsequently weaned.
- Upon completion of breeding soundness evaluation, boars should be fed at a level of energy that will prevent excessive fat deposition.
- Nutrients other than energy should be provided to meet the minimum daily recommended allowance of 14% crude protein.
- Boars tested individually or in small groups in close confinement should be managed upon completion of the test in a manner to develop physical hardening and to stimulate sexual arousal and libido.
- Hardening includes the following:
 - a) Shifting boars to different locations,
 - b) Providing fence-line contact with cycling females.

This may be especially important where the aggressiveness of the boars precludes mixing them.

3.4.3 Sow

- Sows come to heat once in every 21 days if they are not bred and are in a good condition.
- Good feeding and management induce heat and can result in large litter size.
- Sows should be well fed on a balanced diet during lactation so that they wean in a good body condition. After weaning they can be fed 4kgs per day until breeding or until 10 days after weaning if the sow does not return to heat by then.
- Sows are often culled after their eighth litter because statistics show that sow productivity drops at that time to a point where higher production is attainable by replacing her with a gilt.
- It is important to follow instructions when vaccinating pigs
- Sows should be vaccinated against parvovirus, erysipelas and Leptospirosis using farrowsure. Sows are vaccinated at least 2 weeks before breeding.
- Litterguard should be given twice before farrowing in gilts for the prevention of scours induced by *Escherichia coli* (enterotoxigenic strain) and *Clostridium perfringens* in piglets.

4

BREEDING AND MANAGEMENT DURING GESTATION



4. BREEDING AND MANAGEMENT DURING GESTATION

4.1 Checking for signs of heat

It is important to check if the female is ready for the boar as that is the only time it will be able to conceive its mated. The cycle of a pig is 21 days but ranges between 18-24 days. The signs of heat are checked in the morning and late afternoon when it is cool. The boar is taken in the female pens to help check for the signs.

4.2 Signs of heat

- Restlessness
- Vulva turns reddish and is swollen
- White mucus discharge from vulva
- Sow or gilt on heat will mount pen mates and it will allow itself to be mounted by others
- Sow or gilt will stand still when pressure is applied to her back
- Sow /gilt will stand for the boar

4.3 Assisting a sow to come on heat

The sow or gilt should come on heat after every 21 days naturally, but at times the sow will need to be stimulated to come on heat.

- Remove the sow from piglets early (at 5 weeks of age) and all at once
- Take the sow to a pen with dry sows
- Put the sow close to a mature boar, in a way that makes direct contact (sight, smell, sound) possible.
- The sow should not be given any feed on the day of weaning.
- The next day feed about 4kg/day until servicing or up to 10 days (flushing).
- Put the sows in groups (stress stimulate heat) under supervision
- If there are heat problems, change the type of feed for a few days.

4.4 Method of Mating

The farmer can use either natural mating or artificial insemination. The decision on what method to use depends on unit size and cost. It is always economical to carry out artificial insemination since there is no cost of keeping a boar.

(i) Natural service

- In the natural mating system, sows/gilts on heat are taken to the boar pen for service.
- Ensure that each sow/gilt is successfully mated twice, and the exact breeding date is noted.
- The boar pen with adequate space for turning around and mating can be used as the mating pen.
- If the boar has problems mounting the sow/gilt and the stockman will have to assist it
- Fertility and conception rates are higher with natural mating due to better heat detection, more accurate timing of mating, increased semen dose and longer life span of fresh semen.
- Requires less labor.



Disadvantages

- Risk of venereal diseases which may result in decreased productivity
- Cost of maintaining a boar
- The need to frequently change the boars to reduce inbreeding
- More sow and boar injuries.

(ii) Artificial insemination

- Semen can be obtained from a boar, extended and inseminated into a sow/gilt on standing heat.
- Trained personnel are required to carry out artificial insemination in pigs. Pig Industry Board (PIB) offers such training and AI services.
- There is no need to keep boars hence the cost of keeping boars is avoided.
- It prevents the spread of certain diseases
- Using artificial insemination technology, the boar's ejaculation can be used on many sows (10 to 30 sows).
- It allow for rapid genetic progress.



Figure 3-9 Artificial insemination

Materials required for AI

Should a farmer decide to regularly use artificial insemination, he/she may need to purchase the following for the purpose.

- Pistolette
- Thaw monitors
- Flask
- Sheaths
- Artificial insemination gloves
- Nitrogen tank (with nitrogen)
- Semen straws
- Estrumate (hormone)



Figure 3-10 Artificial insemination equipment

Semen Care

- Semen can be available in frozen and fresh forms.
- Insemination with fresh semen has higher chances of success.
- Fresh semen is relatively more expensive and does not usually survive for long periods. Frozen semen has longer shelf-life than fresh.
- Frozen semen has a lower fertility rate on average.
- Level of hygiene should be high therefore, ensure all necessary equipment is thoroughly cleaned and available before beginning any artificial insemination procedure.

Frozen semen

- It is essential to read all the instructions provided by the registered semen supplier well before thawing and testing.
- Frozen semen straws are kept very cold inside a stainless-steel container surrounded by liquid nitrogen.
- The level of liquid nitrogen must be checked regularly and maintained to ensure that frozen semen remain at -196°C for the duration of storage.
- Frozen semen has an unlimited shelf life, if properly stored.
- Only one straw is required for each sow to be inseminated.
- Thaw the semen only when ready to use.
- Semen extenders must be always kept in the freezer.
- Exactly 45 minutes before insemination of the sow/gilt, remove the insemination bottle from the freezer and place it in a hot water bath at 50°C .
- With a thermometer, monitor the water temperature until it and the insemination bottle reach 20°C .
- Swiftly remove one straw at a time from the nitrogen tank with tongs and place in a 50°C water bath for 45 seconds.
- After 45 seconds remove the straws of semen from the water bath.
- The straws should dry well.
- Cut the straw below the bead and place the open end into the extender bottle.
- Cut the closed end of the straw after allowing air bubbles in the straw to gather.
- Gently drain the concentrated semen from the straw into the insemination bottle with extender.
- Put the cap on the bottle and gently shake the bottle with the semen and extender in it.
- Place the extended semen in an insulated container with warm gel packs.
- Use the semen as soon as possible.

Fresh semen

- Fresh semen must be used within 3 days after the collection for best results.
- The semen should be stored in an air-conditioned room or special storage container at 15.6°C . Protect the semen from sunlight and light.
- If to be delivered semen bottle(s) must be securely packed in a styrofoam container.
- Avoid vibration to prevent shock to the semen.
- Do not expose semen to direct sunlight or light.
- Just before insemination, place semen container in use a water bath at 30°C or in contact with human body to warm to human body temperature.
- Softly invert the semen container several times before insemination.
- Do not shake the semen to mix it.
- Use the semen as soon as possible.

4.5 Pregnancy diagnosis

- i. Daily observation of physiological and behavioral signs of heat of the sow when a boar is present, particularly 18-24 days post-service.
- ii. Kits: pig pregnancy rapid test kits utilize the high affinity of monoclonal antibody against an estrogen marker in pigs, which can easily identify the concentration and presence of it. If the concentration is above certain number, the pig will be pregnant and if not, the pig will not be pregnant. This kit is used to test pig urine, which should be collected within 23 to 32 days after mating or insemination.
- iii. Ultrasound machines: pigs can be scanned for pregnancy with the ultrasound scanners days after insemination, but it is much more effective to scan them at 28 days.

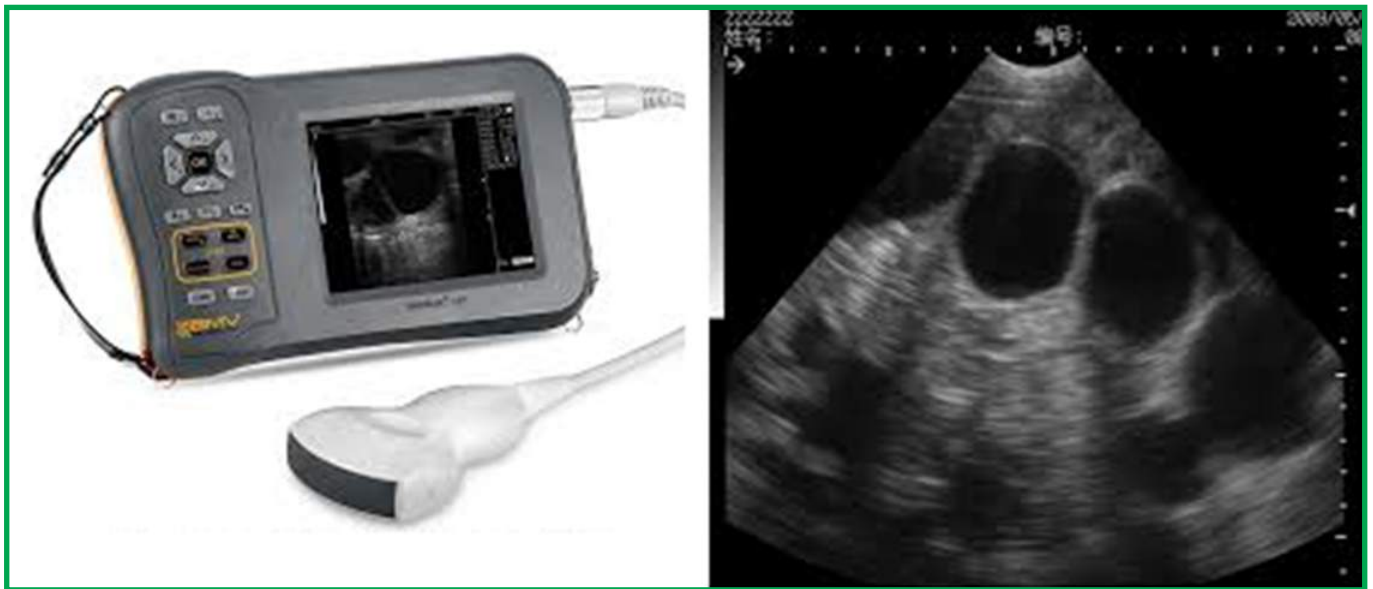


Figure 3-11 Pregnancy diagnosis Ultrasound scanner

5. FARRROWING



5. FARROWING

5.1 Pre-farrowing

- Initiation of farrowing starts 10 to 14 days before the actual date.
- Development of the mammary glands and the swelling of the vulva become prominent.
- Teat enlargement occurs and the veins supplying the udder stand out blatantly.
- The imminent signs of farrowing include a reduced appetite and restlessness as the sow stand up and lie down.
- Milk secretion can be expressed from the teats with a gentle hand and finger massage.
- A slight mucous discharge may be visible on the lips of the vulva.
- As farrowing approaches the vulva becomes enlarged, together with the vagina that leads to the cervix or opening into the womb.

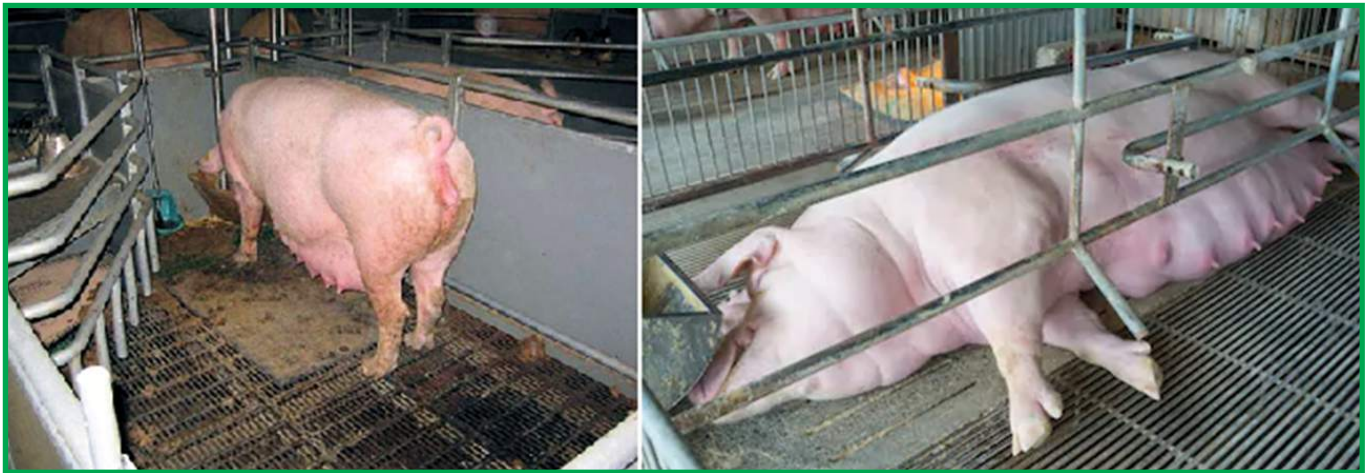


Figure 3-12 Heavily Pregnant sows

5.2 Time of Farrowing

- Farrowing process can range from 3 to 8 hours and piglets are usually delivered randomly every 10 to 20 minutes.
- There is often a gap between the first and second piglet of up to 30-45 minutes.
- Most piglets are presented headfirst but there are more pigs presented backwards towards the end of the farrowing period.
- Immediately before the presentation of a piglet the sow lays on her side, often shivering and lifting the upper back leg.
- This is a vital incidence to observe because it may indicate the presence of a stillborn piglet.
- Twitching of the tail is seen just as a pig is about to be born.

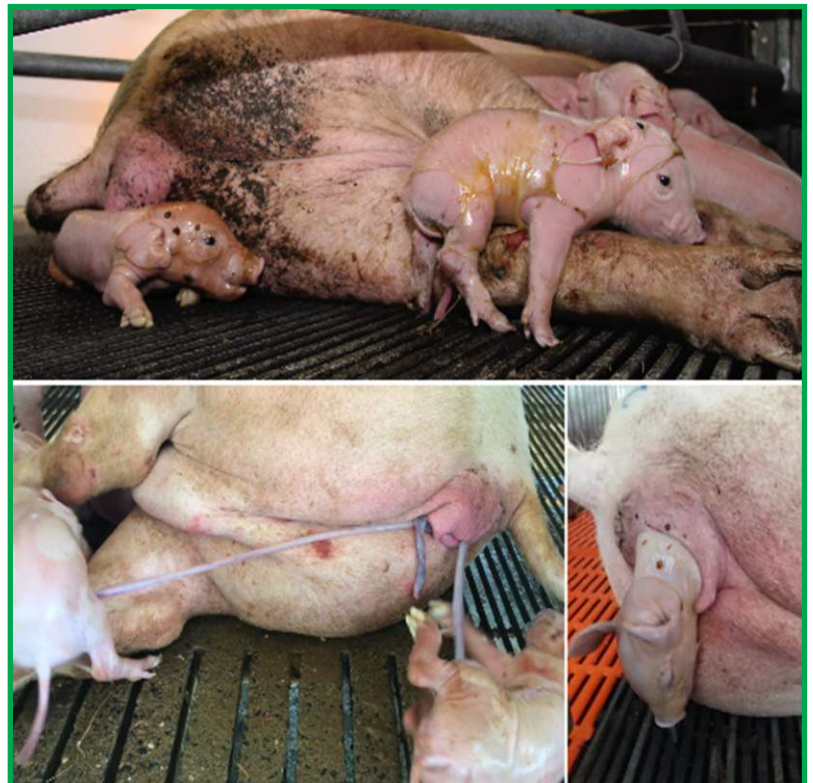


Figure 3-13 Sow farrowing

5.3 Post-farrowing

- Post-farrowing is characterized by the delivery of the placenta.
- This often occurs over a period of 1-4 hours following parturition.
- It is a signal to the end of farrowing, though some afterbirths are sometimes passed during the process of farrowing.
- Once the sow has completed the farrowing process there are certain signs that should be observed.
- The sow appears at peace, grunts and calls to the piglets.
- The sow stops shivering and moving of the top hind leg ceases.
- However, if the sow is still distressed shivering and moving top hind leg, it is likely that a pig is still presented.
- After the placenta has been discharged, a slight to heavy discharge is delivered for the following 3-5 days.

5.4 Problems during farrowing

- Failure to deliver the piglets is shown either by lack of piglets being born, the sow panting heavily and obviously in distress or blood and / or mucus at the vulva.
- The sow may fail to deliver the piglets due to a large litter and inertia of the womb.
- Two or more pigs presented in the birth canal at the same time.
- Very large piglets and a small pelvis.
- Rotation of the womb.
- Illness of the sow, for example acute mastitis.
- Failure of the womb to contract (uterine inertia).
- Failure of the cervix to relax and open.
- Dead pigs inside the womb.
- Mummified pigs.
- Nervousness of the sow, excitement and distress.
- An over fat sow.

6 MANAGEMENT OF PIGLETS



6.1 Drying and provision of warmth and reduction of crushing

Drying of each piglet should be done carefully with a clean dry cloth. A creep area should be provided to ensure adequate warmth. There is need to provide a farrowing crate to reduce the incidence of crushing as the sow will have a restricted area to move around.

6.2 Navel cord treatment

A few minutes after birth, the umbilical cord may be pulled gently away or cut if necessary (to about 5 cm length). The navel of each piglet should be soaked in an iodine solution to prevent inflammation and joint ills

6.3 Colostrum

The piglets should have access to colostrum soon after birth. There is need to assist piglets to find the teat so that all the piglets get colostrum.

If the milk produced by the sow is too little to meet the needs of the piglets, piglets can be supplemented with colostrum from cow or artificial formula.

Option 1

- Eggs (protein source)
- 1 litre fresh warm water,
- 2 litres whole milk (source of lactose and milk protein),
- 2 teaspoonful cooking oil (energy) and
- Terramycin Soluble Powder 1 ¼ teaspoons.

Option 2

- 2,5L fresh cow's milk
- 150ml fresh cream
- 125ml of glucose
- 1 egg

Option 3

- 4,5L of fresh cow's milk
- 0,5l cream
 - Piglets are given small quantities of the mixture every 2 to 3 hours.
 - The mixture is given from 50ml/ given time so that each piglet gets 350ml per day.
 - The quantity is gradually increased to about 100ml so that each piglet gets 750ml at three weeks of age.

Creep feed has to be availed as well as fresh, clean water all the time.

- Numbered ear tags are also used but are not usually suitable for pigs penned together as the tags can be lost.
- Tags are more often used to renumber stock already identified by notching like newly purchased breeders.

6.8 Tail Docking

- Remove a third of the tail end or the whole tail on day one of age.
- It is done to prevent pigs from biting each other's tail.
- Apply wound powder or spray to avoid risk of infection.
- Clippers or sharp scalpel blade can be used.

6.9 Castration

- The practice is not frequently done.
- However, if it is essential, it has to be done between 2 days and 8 weeks of age.
- A knife, razor or scalpel which is very sharp and clean must be used.
- Cut the bottom end of the scrotum.
- Squeeze the testicle above the cut end of the scrotum and the testicle will come out.
- Pull each testicle out as far as possible, twist the testicular cord around several times.
- Cut the cord by scraping the knife slowly up and down.
- Apply either tincture of iodine, Dettol or antibiotic powder on the wound.

6.10 Weighing

If a scale is available as routine there is need to weigh the piglets at birth and at weaning.

6.11 Creep feeding

Creep feed can be given to the piglets from 1 week of age up to a week after weaning when weaner feed is introduced. The feed should be given on a little and often basis.

6.12 Weaning

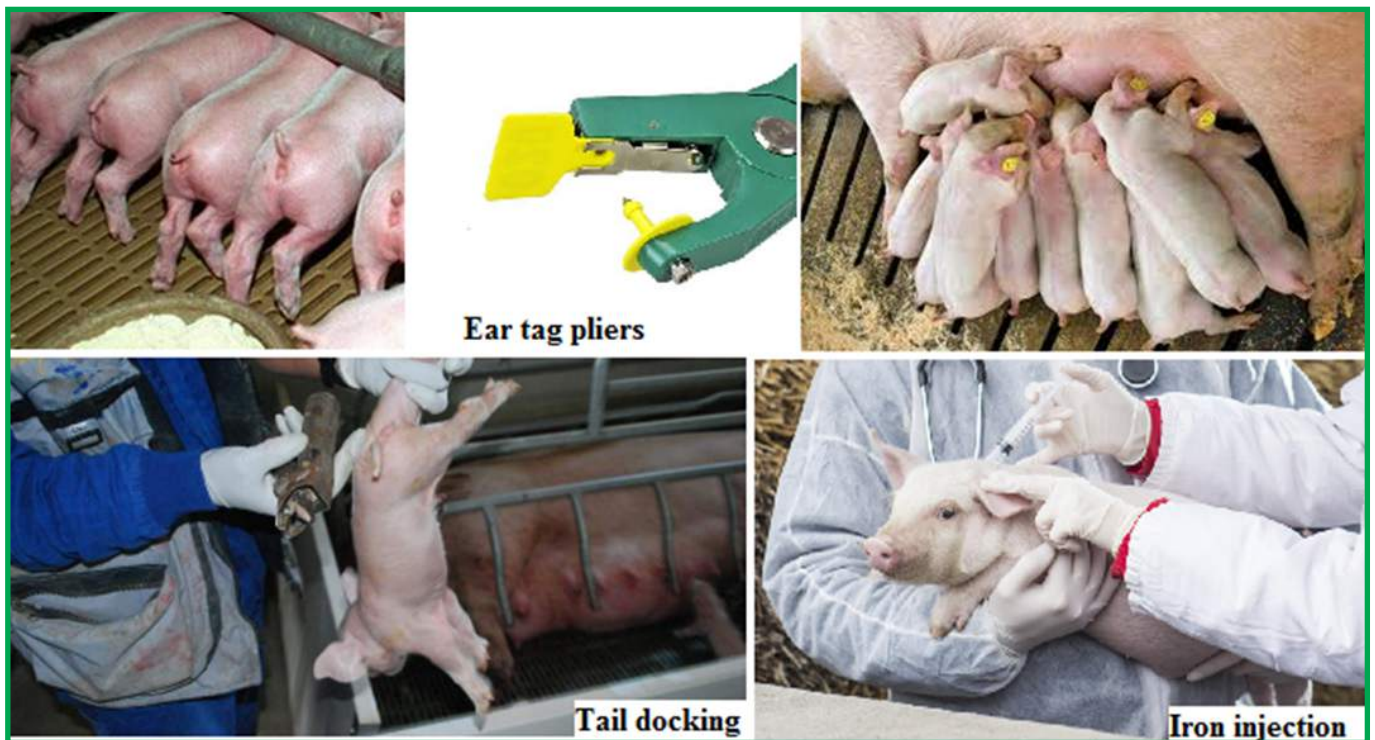
- Weaning is a stressful process as it affects piglets socially and physiologically. It is associated with the development of stressful behaviours like cannibalism, bad toilet habits, and depressed growth rates and scouring.
- The resultant deaths and growth checks have a large negative impact on grower herd performance, resulting in reduced profitability.
- High standards of management can significantly reduce post-weaning losses and improve growth rates by diminishing the stress of weaning.
- When the suckling period is reduced, more sophisticated housing, feeding and management abilities are essential to raise the piglets.
- The normal age at weaning is at 28-35 days. Early weaning can be practiced if the sow dies or fails to produce milk and there are no other sows to foster the piglets on.

6.4 Fostering

If a sow has more piglets than the number of teats she has, the extra piglets can be placed with another sow with a smaller number of piglets. Fostering should be practiced when piglets to be fostered would have had a chance to suckle from their mother. Fostering won't be successful in sows which would have farrowed more than 3 days previously because it takes 3 days for unused teats to dry off.

6.5 Eye Teeth Clipping

- Piglets have 8 very sharp temporary tusks/teeth at birth.
- The teeth must be clipped to prevent injuries to the teats of the sow during suckling.
- Farmers should use a teeth clipper on the day of birth
- Do not clip the teeth too close to the gums.



6.6 Iron Injection

- Sow milk does not provide enough iron to piglets hence iron injection has to be done normally at 3 days of age.
- Iron injection should be done in the neck area
- Red soil can be spread in the sty for the piglets to lick as an alternative source of iron though research has shown that the practice is not very effective.

6.7 Ear Notching

- It is essential for animal identification.
- It is done with an ear notcher or a sharp scalpel blade.
- It is best done on day one of age.

- Before their arrival properly wash and disinfect the room and all equipment in the weaner pens.
- Ventilation or ventilation controls should be checked for functionality and properly set.
- Allow time for the rooms to become warm and dry before the piglets arrive.
- Feeders and supplemental heat must be in place and functioning, and waterers should be checked and adjusted to the proper height.
- Weaner pigs should have one watering space for each 10 to 15 pigs; if using nipple drinkers, the delivery capacity should be 2 or more cups of water per minute.
- After weaning litters are frequently regrouped according to size and sex and moved to weaners' house.
- During the first few hours after weaning, pigs need free access to feed and water.
- Ensure the water height adjustment to confirm proper access.
- Waterer height should be attuned to nearly shoulder height of the smallest pigs in the pen.
- Make sure that fresh feed is always available in the feeder (ad lib feeding).
- Fresh feed should always be provided several times per day.
- Ensure that pigs have found the water and are beginning to develop normal feeding behaviour.

Things to observe include:

- * Mental status — alert versus depressed
- * Body condition — normal vs thin
- * Abdominal shape — bloated or gaunt
- * Skin — sleek versus fuzzy
- * Appetite — feeding at the feeder versus huddled
- * Evidence of urination and/or defecation
- * Signs of dehydration — sunken eyes

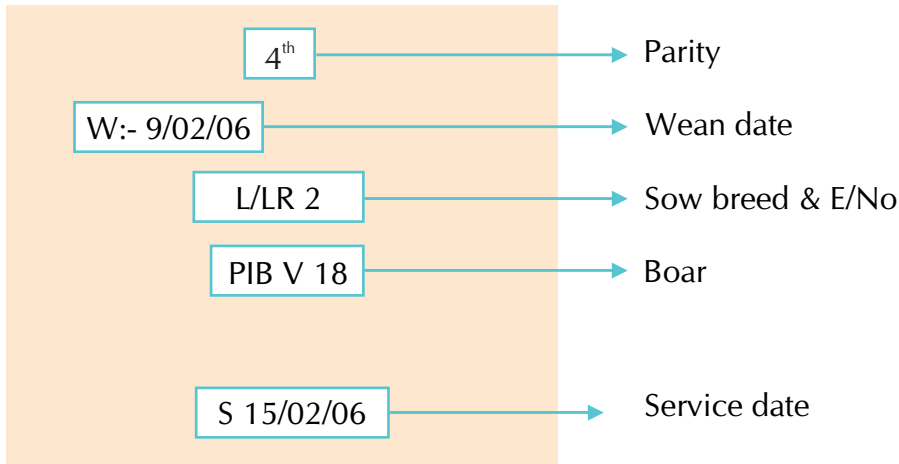
Managing Growing pigs

- Pigs are graded again and sorted into groups for size and/or sex on entering the grower pens. This allows more accurate feeding by altering the amount and type of ration to be fed to each group.
- Emphasis is on fast economical growth of pigs and hence, feeding is on a liberal scale, regularly ad lib. If restricted, then it has to be ensured that they feed for 30 minutes twice a day.
- Reducing stress during this period is very important. Avoid overcrowding which causes high stress which results in depressed efficiency of feed utilisation and hence limit growth rate and cause disparity in growth.
- Feed the recommended feed types.
- Most pigs should be able to reach 50 kg live weight, without the pigs becoming excessively fat.
- Environment factors such as temperature should be given attention as this affects the comfort of the pigs hence the growth rates and feed conversions.
- Temperatures can be regulated by increasing or decreasing stocking rate, controlling ventilation and temperature by mechanical means e.g., using spray cooling to reduce the effects of high summer temperatures if need arise.

7. Breeding Records

- The causes of infertility can only be determined and corrected through the use of records.
- Service records are required for each breeding sow and boar.
- Breeding records assist in detecting the signs of heat accurately and scheduling of mating at the optimum times.
- Improve accuracy in determining farrowing times.
- Helps to prevent inbreeding and inform the animals to be culled from the herd.

7.1 Sow card



7.2 Sow life record card Sow I.D No.....

Litter	Weaning to Service (days)	Service date	Actual Farrowing date	Farrowing Interval (days)	Piglets born alive	Still born piglets	No. reared	Pigs + or	Litter birth weight	Litter weaning weight	Remarks

7.3 Service Records

A record of all bred animals need to be entered in the service book

Sow E/No	Date Weaned	Parity	Boar E/No	Service Date	Return check dates	Weaning to service interval (days)	Due date

7.4 Farrowing Records

Sow No.	Parity	Boar Ear No.	D.O.B	No. born		Total birth wt.	Av wt.	5 wks Date	Weaning Date	No weaned	Total weight	Average weight	Remarks
				Alive	Dead								

7.5 Death Certificate

It is important to record all deaths and there is need to have witnesses to sign.

Date	Ear No.	Sex	Age	Cause of death	Pen No.	Signatures

7.6 Daily treatment record card

All treatments should be recorded

Date	Pen	Ear No.	Class of pig	Disease type	Treatment type & quantity

7.7 Feed

	Brought Forward	Delivered	Used	Carried Forward
Gestation				
Lactation				
Creep				
Signature.....		Date.....		

(Information from the Pig Industry Board pig production Manual)

Exercise

1. At what age will a gilt first show signs of heat?
2. What are the signs of heat in pigs?
3. At what age should a gilt be allowed to mate?
4. Discuss how hand mating is done in pigs and ways to improve chances of conception.
5. Discuss the reasons why farmers keep pigs (each participant should state reasons for raising pigs and in his/her area). Create a list that ranks the reasons from the most important to the least important.
6. Each participant should describe the climatic conditions in his/her area and name breed(s) that can do well under such climatic conditions.
7. Discuss other traits of economic importance in pig production and ways of improving them.
8. How does one confirm that a pig has conceived?
9. What are the causes of mortality in piglets and how are they prevented?
10. Why is fostering practiced and explain the process.

At the end of the training, the facilitator is expected to highlight the most important factors on breeding, mating plans and the actual management of breeding stock. It is important to also assess if the participants have understood and assist in where they need clarification. This is also the point where they can ask and questions related to the training but may not have been mentioned.

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10. Glossary

Baconer-A pig weighing between 90-100kg

Boar – a male pig over 6 months of age that can be used for breeding.

Boar effect – An uncastrated male pig, or the exposure to gilts, causing early puberty in boars

Breed – to allow a male and female animal to mate; a group of animals with the same characteristics and ancestry.

Estrus – when a female animal is in heat and ready to mate.

Farrowing – Giving birth to a litter of piglets.

Feed conversion efficiency – The measurement of the efficiency of a pig's ability to convert feed into muscle or body mass.

Gestation – the period between breeding and birth, on average 114 days.

Gilt – a young female pig that has never given birth.

Grower – a pig that is intended to be raised/sold for slaughter.

Hand mating – A female pig and male boar exposed in a small, enclosed space for the purpose of breeding.

Heterosis – the process of cross-breeding pigs to produce more favorable breed traits such as litter size, conception rate, piglet survival rate and growth.

Litter – a group of piglets born to a single sow.

Market weight – Acceptable weight at which a pig can be sold

Mating – The process of sex for reproduction.

Porker -A pig reared to pork weight, ranging 50 -90kg live weight, rather than to bacon weight. Usually achieved between four and six months of age, depending on breed and feeding.

Service-Deposition of semen into the cervix of a sow or gilt. May be by "natural" boar or artificial insemination.

Sow – an adult female pig that has farrowed a litter of piglets.

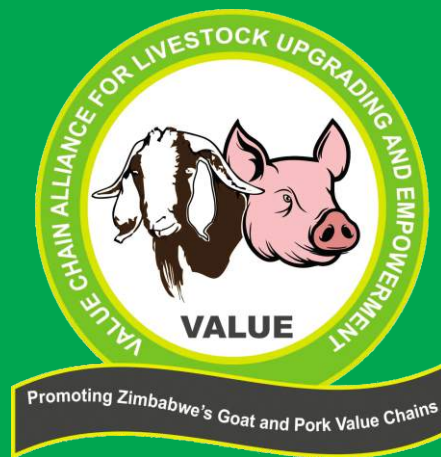
Standing Heat-when a sow or gilt is ready to be bred, she will assume a rigid stance and maintain it throughout the servicing

Teats – Nipples where the piglets suckle the milk.

Testes – Male pig's reproductive organs or glands.

Wean – Permanent removal of the piglet from the sow.

Weaner-A piglet separated from its mother and eating only solid food.



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