
**ONE DAY CAPACITY BUILDING TRAINING
WORKSHOP ON PIG PRODUCTION FOR
SECONDARY SCHOOL YOUTHS IN
OGUN STATE**



AGRICULTURE - IN - SCHOOLS PROJECT

Organized by

**EXTENSION AND ADAPTIVE RESEARCH PROGRAMME
AGRICULTURAL MEDIA RESOURCES AND EXTENSION CENTRE
(AMREC)
FEDERAL UNIVERSITY OF AGRICULTURE ABEOKUTA**

May 2012

GENERAL OVERVIEW OF PIG PRODUCTION, ENTERPRISE SELECTION AND ESTABLISHMENT

Dr. (Mrs.) O. T. Irekhore

INTRODUCTION

The words pig, hog and swine are all generic terms without regard to gender, size or breed. Pigs originated from Eurasian Wild boars. A pig is any of the animals in the [genus *Sus*](#), within the [Suidae family](#) of [even-toed ungulates](#). Pigs include the [domestic pig](#), its ancestor the [wild boar](#), and several other wild relatives. The domestic pig (*Sus scrofa domesticus*) is usually given the [scientific name](#) *Sus scrofa*, although some authors call it *S. domesticus*, reserving *S. scrofa* for the [wild boar](#). It was domesticated approximately 5,000 to 7,000 years ago. Their coats are coarse and bristly. Their head and body length ranges from 0.9 to 1.8 m and they can weigh between 50 and 350 kg.

Classification of Pig

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Subclass:	Theria
Infraclass:	Eutheria
Order:	Artiodactyla
Family:	Suidae
Subfamily:	Suinae
Genus:	Sus

A typical pig has a large head with a long snout which is strengthened by a special prenasal bone and by a disk of [cartilage](#) at the tip. The snout is used to dig into the soil to find food and is a very acute sense organ. There are four [hoofed](#) toes on each foot, with the two larger central toes bearing most of the weight, but the outer two also being used in soft ground. Pigs are [omnivores](#) which means that they consume both plants and animals. In the wild, they are foraging animals, primarily eating leaves,

grasses, roots, fruits and flowers. In confinement pigs are fed mostly concentrate diets which consist of different feed ingredients combined to provide rations.

SOME FACTS ABOUT PIGS

- Pigs are very intelligent and learn quickly. They pick up tricks faster than dogs. Pigs rank number 4 in animal intelligence behind chimpanzees, dolphins and elephants. Piglets learn their names by two to three weeks of age and respond when called.
- Pigs are very social animals. They form close bonds with each other and other species. Pigs enjoy close contact and will lie close together when resting. Pigs use their grunts to communicate with each other.
- Pigs are highly prolific. A sow can give birth to a litter containing 7 to 18 piglets, about 2 – 3 times a year. The gestation period of a sow is 114 - 115 days (3 months, 3 weeks and 3 days).
- A piglet (baby pig), weighs about 1.5 kilograms at birth and will double its weight in just 7 days.
- Weaning occurs at two months of age or less.
- Pigs are very clean animals. They keep their toilets far from their living or eating area. Even piglets only a few hours old will leave the nest to relieve themselves.
- Domestic pigs are rarely aggressive. The only exceptions are sows with a young litter and boars if provoked.
- Pigs are much more tolerant of cold than heat. Pigs have no sweat glands, so they can't sweat. They roll around in the mud to cool their skin. The layer of dried mud protects their skin from the sun. If available, pigs, who are great swimmers, prefer water to mud.
- Some pigs have straight while some have curly tails.
- Pigs have a great sense of smell. Their powerful but sensitive snout is a highly developed sense organ.
- Pigs also have a great field of vision, because their eyes are on the sides of their heads.
- Pigs have four toes on each hoof, but only walk on two toes per foot.
- A mature pig has 44 teeth.
- A pig can run a 7 minute mile.

Nearly half the world's pig production is in Asia with a further 30% in Europe and in the USSR. Pigs can be reared almost anywhere given suitable housing and management. [Domesticated pigs](#) are commonly raised as livestock by farmers for meat (generally called [pork](#), [hams](#), [gammon](#) or [bacon](#)), as well as for [leather](#). Their bristly [hairs](#) are also used for brushes. Some breeds of pig, such as the Asian [pot-bellied pig](#), are kept as pets.

Pigs have some major potential advantages which make them suitable for use in providing quick and cheap supply of animal protein.

Potentials of the Pig

- ❖ Pigs produce meat without contributing to the deterioration of the natural grazing lands and are less affected by seasonal changes.
- ❖ They are fast growing. They convert concentrate feed to meat twice as efficiently as ruminants.
- ❖ They have high fecundity and prolificacy and short generation interval. Their output in terms of yield of meat per tonne of live-weight of breeding female per year is in the region of six times that of cattle.
- ❖ They have a quicker turn-over rate on investment as compared to cattle.
- ❖ Their relatively small size, when compared with cattle, provides for more flexibility in marketing and consumption.

The capacity of the pig to transform concentrate feeds and other waste products into edible human food has been responsible for its prominence in many parts of the world.

SOME TERMINOLOGIES IN PIG PRODUCTION

- ✓ **AI** - artificial insemination.
- ✓ **Barrow**- male pig castrated before reaching sexual maturity.
- ✓ **Boar**- male hog or pig with intact testicles.
- ✓ **Castrate**- remove testicles by surgery.
- ✓ **Colostrum**- first milk produced by the sow; it provides immunity to the baby pigs for the first few weeks.
- ✓ **Creep feeder**- area accessible to small pigs but not their dams, in which a high protein supplement is provided.
- ✓ **Cull sow**- full-grown female sold for slaughter.
- ✓ **Dressing percent**- percentage of the carcass usable, compared to liveweight.
- ✓ **Farrow**- to give birth to pigs.
- ✓ **Flush feed**- increase feed to stimulate ovulation in females.
- ✓ **Full-(self)-feed**- animals are allowed to eat as much as they will clean up; feed is available at all times.
- ✓ **Gestation period**- pregnancy, lasting about 114 days in swine.
- ✓ **Gilt**- young female that has not yet produced a litter.
- ✓ **Growing-finishing pig**- animal weighing between 40 and 220 lbs. that is being fed for slaughter.
- ✓ **Runt**- small or weak pig in a litter.
- ✓ **Shrink**- weight loss, usually temporary.
- ✓ **Sow**- female which has farrowed at least once.
- ✓ **Wallow**- water-filled depression or container large enough for pigs to lay in to cool off during warm weather.
- ✓ **Weaning**- removing young from their mother.
- ✓ **Yield**- percentage of the carcass in the four lean cuts: ham, loin, picnic, and Boston butt.

ENTERPRISE SELECTION

In starting a pig production enterprise determine the type of enterprise to go into following the long range plans for swine enterprise.

Long Range Plans for Swine Enterprise

A. Consider:

- i. Current resources
- ii. Current liabilities, and
- iii. Management ability including marketing skills.

B. Then decide on:

- i. What to produce (i.e., feeder pigs, feed purchased feeder pigs, or produce and finish own pigs),
- ii. How many pigs to produce?
- iv. How often and when (No. of litters & farrowing schedule or groups of feeder pigs)?, and
- v. What type of housing system (portable units on the pasture, drylot, partial confinement, or total confinement system)?

Then develop a management style to fit specific characteristics of your operation. (Note – For a beginner, minimize investment in overhead, start small, and grow slowly to reduce risk).

DIFFERENT ENTERPRISES TO CONSIDER

1. Sow Herd Enterprises

- a. Feeder pig production operations
- b. Farrow to finish operations

2. Feeder Pig Finishing Operations

PRODUCTION SYSTEMS

1. Feeder Pig Production

This produces pigs for the finishing operation. A typical market weight has been 18 to 30kg, but there has been some changes in recent years. This system fits best on the farm where there is not much of concentrate feed to finish pigs, but where adequate labour and facilities for sow herd management are available. Examples:

- a. A part-time farmer.
- b. A small farm in feed-surplus areas with available market (i.e., finishers market).
- c. Step-up for a new enterprise.

Advantages of the Feeder Pig Production System

- i. Requires relatively small capital inputs.
- ii. Possible to generate a relatively consistent income.
- iii. Requires less feed and involves less manure-handling.

Disadvantages of the Feeder Pig Production System

- i. Relatively higher levels of diseases and management problems such as the conception rate, embryonic survival, pre and post-weaning survival rates, sow's feed intake, milk production, etc.
- ii. Requires greater management skills and labor to handle potential problems.
- iii. Variations in the price of feeder pigs, i.e. year to year, season to season, producer to producer, and sale to sale.

2. Feeder Pig Finishing Operation

This purchases young pigs (about 20kg or above) and feeding them to the market weight. It requires large sums of operating capital, thus facing a considerable financial risk. Fits best on the farm where there is shortage of labor and skills for a sow-herd management and where there is availability of concentrate feed for finishing pigs. In this type of system the operator:

- a) Must be skilled in buying and selling.
- b) Must be willing to spend enough time to keep up with the market.
- c) Can withstand periods of financial losses, or be able to prevent such losses, i.e. has an adequate capital and(or) ability to use various marketing techniques

Advantages

- i. Capital turnover is relatively fast.
- ii. Requires less labor and management skills.
- iii. Can market grains through pigs, and swine wastes can be used as a fertilizer.
- iv. Has a flexibility to shut-down with modest penalties.

Disadvantages

- i. Significant expenses for buying feeder pigs:
 - a) About 40% of total production costs.
 - b) Price/kg is usually 2 times of the for market pigs
- 2) May face lack of genetic uniformity and also unknown health status, thus variations in growth performance and carcass merit, and may increase medication costs & mortality rate.
- 3) The market price is highly variable for both the raw material (feeder pigs) and the end product (market pigs). Therefore increase and decrease in the market prices can directly & greatly influence the profits/losses.

3. Farrow to Finish Operation

This combines both operations mentioned above. The farmer produces own feeder pigs and raise them to market weight. Returns from the Farrow to Finish System will be more than for the Finishing System which will in turn give higher returns than the Feeder Pig System.

Feeder pig producers have less products to sell. Finishing enterprises: For example

- Pay additional costs of transferring pigs such as transportation costs, commission, marketing costs, etc.
- May increase medication costs and mortality rate because of stress, exposure to new microorganisms, changes in environment, etc.
- May experience slow or no progress in improving growth performance and carcass traits.
- There may inefficiencies in the use of various facilities because all facilities may not be occupied all the time. Thus, farrow-to-finish operations can take advantages of both and/or minimize disadvantages.

CONFINEMENT AND OUTDOOR PRODUCTIONS**1. Possible Problems with Intensified Confinement Production?**

- Higher investments for permanent buildings, equipment, etc.
- Have to use housings/equipments continuously to pay for the fixed cost.
- Have to work in a clockwise precision to be profitable.
- Intensified disease problems, thus controlling diseases is more vital.
- Diets must be adequate because of no access to other sources of nutrients.
- Problems with manure disposal, odors, flies, etc., & no easy solution.
- Environmental regulations such as air & water pollution.
- Animal welfare and(or) rights concerns.

Because of three major problems/concerns [1) high investments & production costs, 2) waste & potential pollution problems, and 3) animal welfare concerns], there are some trends toward moving away from the confinement pig production.

2. Outdoor Pig Production

A. Attractive features:

- 1) Capital outlay is low.
 - 2) No slurry problem.
 - 3) Strong healthy pigs are produced(?).
 - 4) Labor costs are lower(?).
- 5) Comparable profitability to the indoor herd.

B. Drawbacks:

- 1) Productivity tends to be low.

- 2) Hard to manage individual animals - Controlling pigs, and also recognition of unproductive sows and boars.
- 3) Confining pigs - Extensive fencing requirements.
- 4) Checking pigs on outlying land may be difficult.
- 5) Predators & young pigs, and birds/vermin & feed.
- 6) Weather & movement of stock.

ESTABLISHMENT OF PIG PRODUCTION ENTERPRISE

In establishing locate pig farm sites in non – residential areas and ensure that your neighbors will not be bothered by odours.

Environmental Requirements for Establishing a Pig Farm

- 1) Climate/rainfall – A mild climate with no excess of rain is conducive for pig rearing.
- 2) Soil type - Gravel and sandy soils over clay. }
- 3) Topography - Level or gentle slope. } Well drained soil
- 4) Land - An acre can accommodate 5 to 8 sows on range. In confinement larger number of animals can be accommodated (up to 5 times more) in backyard management while over 10 times more in large automated commercial farms.

INPUTS IN PRODUCTION

1. Backyard Operation

- A. Investment
 - i. A livable house with concrete floor
 - ii. Seed Stock/ Foundation animals
- B. Operating Expenses
 - i. Feeds
 - ii. Veterinary medicines, vaccines, feed additives etc.
 - iii. Health Insurance (optional)

2. Commercial/Large Scale Operations

A. Investment

- i. **Pig houses**
 - Farrowing house
 - Gilt/Dry/Gestating house
 - Boar house (may not be necessary if AI is used)
 - Weanling house
 - Growing/Fatenining house
 - Isolation house
- ii. **Equipment**
 - Water Pump
 - Electrical connections
 - Hammer Mill
 - Feed Mixer
 - Feed storage and distribution equipment (Automatic Feeding System)
 - Automatic Watering System

Pig and feed scales

Other farm tools- spade and spading fork, wheel barrow, rake etc

B. Purchase of Stock

Gilts/Sows

Boars

C. Operating Expenses

Feeds

Veterinary medicines, vaccines, feed additives etc.

Health Insurance

Labour

Repair and maintenance of buildings

Maintenance of machinery and equipment

HOUSING AND EQUIPMENT

Pig houses must be well constructed for maximum performance of the animals. For backyard operations houses can be constructed using locally available material such as bamboo, planks etc. Movable houses are constructed for pigs on range. For permanent pig houses the flooring must be concrete (neither too rough nor too smooth) to allow for easy cleaning and minimize occurrence of parasites and diseases. Pig houses should be provided with concrete feeders and water troughs though other materials such as automobile or truck tires cut in halves may be improvised as drinkers.

**Swine Production:
Pasture-Based System with Hog Housing**



Photo source: USDA-NRCS.

In the public domain.

The boar and boar pen

One boar is required for every 10 to 20 sows. The minimum floor area will depend on whether the pen is to be used for servicing purposes. The floor should be non-slippery and equipped with bedding. If the pen is used for servicing, the floor should be free of slats and other obstructions. Each boar needs about 10 to 15 liters of drinking water per day. Because pigs are in the habit of defecating where they drink water, their water has to be placed in the dunging area. The feeding trough has to be placed as far away as possible from the dunging area and the drinking nipple. The boar pen has to be cool, well-ventilated and free of draughts, with temperature not higher than room temperature for long periods.

The sow and sow pen

In an intensive pig production system, provision is made for five single sow pens per boar, because the sow has to stay there for five weeks and a sow/boar ratio of 1:20 has to be maintained. To manage enough contact between boar and sows, partitions are placed over the slatted area between the adjoining boar and sow pens, because pigs tend to defecate while communicating with pigs in adjoining pens. Alternatively, the sow may be placed in a pen directly next to the boar right after she weaned her litter. For individual feeding, the sows are placed in pens of about 1.8 m² adjacent to the boar pen. As the sows are kept in the same building as the boar, the same temperatures of between 9 and 22°C are acceptable, with an optimum of 16°C. Slatted floors keep the sows relatively dry and clean and a drinking nipple is placed at an angle of 45° degrees above the slatted floor. The estimated water requirements of a non-pregnant sow is five litre per day.

The dry sow and dry sow housing

For a period of about one month after weaning her litter, and for about two weeks before she farrows, the housing, feeding and management of the dry sow go through a critical phase. Dry or pregnant sows may be housed in crates, in groups or in tethers.

The **pregnant sows** are housed in crates. Close the crate at the top with steel rods to prevent the sow from turning around and jumping out. If gilts are kept in crates, they should not be put next to older sows, but rather next to boars. No-fines concrete floors are recommended for insulation against cold, there should be no draughts and the optimum temperature is between 15 and 16°C. Water can be supplied by means of a flushing system in a continuous feeding trough or by means of drinking nipples.

Pregnant sows should be housed in groups of four to five. The sows should be fed individually with partitions for each sow. The floor area includes a sleeping area, a dunging passage and an individual eating space. Group housing can also be done semi-intensively by merely placing a roof over the pens and keeping the sides open. This layout requires less material and construction costs, but problems regarding temperature and ventilation may occur.

The movements of the **pregnant sows in tethers** are restricted by means of a belt around her body, fastened to the floor with a short chain. Handling and accessibility are easier with a tether, because the crate is open at the back. It also simplifies testing for pregnancy in large intensive units. But the tether should not interfere with the freedom of the sow to get up or lie down.

Farrowing pens

The most important considerations regarding housing during farrowing and the first seven to ten days thereafter, are to supply optimum temperatures to the sow and her litter and to limit deaths among the piglets through trampling or overlying. Sows should be placed in disinfected farrowing pens one week before farrowing to allow time for adjustment to the new surroundings. The sow or gilt is washed and treated for scabby skin, not less than two days before she farrows.

The **farrowing crate** is made of steel pipes or round steel rods and should be designed in such a way to allow enough free space behind her for easy farrowing and to prevent piglets from being overlaid. Enough walking space for the piglets should also be allowed.

A **creeping pen** with bedding of wood shavings must be provided for the piglets. A roof over the creeping pen is essential to prevent draughts and to keep the heat inside and the optimum temperature is 27 to 32°C for at least the first five days after birth. Electricity of around 300 to 500 W is required for every creeping pen, and a heating method which is increasingly becoming popular, is the use of heated rubber mats in the creeping area.

For **water supply**, a drinking nipple with an angle of 45° is placed above or next to the feeding trough. The lactating sow needs about 18 to 23 litre of water per day and the piglets in the region of 0,7 to 1,0 litre per day.

It is preferable to equip the litter with a creep feeder for **food supply**. A small, simple self-feeder should be filled twice or three times a day to prevent the feed from becoming stale and mouldy. The feeder can also be equipped with hooks and hooked over the dividing wall between adjoining pens to prevent the piglets from shoving it around. Milk powder strewn on the floor will encourage the piglets to eat.

Weaners and weaner housing

For many years it was customary in South Africa to wean pigs at the age of 35 days, although there is the tendency to wean pigs at an earlier stage. This section focuses on housing for pigs weaned at 35 days, with two litters grouped together, all-in-all-out pens, housing for early weaned pigs and flat deck housing.

A total of about 14 weaner pens are required for a 100-sow unit, taking into account that each sow weans on average 2,3 litters per year, and that each litter contains an average of 10 piglets. To supply the piglets with about one to three litre of drinking water per day, two kind of nipple can be placed at certain angles. For the supply of feed, a moveable self-feeder can be used to adjust the size of the pen as the piglets grow bigger. To keep the cost of materials as low as possible and to create cleaner conditions, the two rows of pens could be placed back-to-back. The walking and feeding passages are then combined with the outer walls of the building, with two manure channels against each other in the middle of the building.

The **all-in-all-out pens** are designed to accommodate all the litters of the sows that give birth in the same week in an enclosed section of the building when they are being weaned. Afterwards they are transferred to a grower unit - all during the same week. All piglets are moved to the grower pens at five weeks.

Early weaning means that the piglets are weaned at the age of 21 days, and here the regulation of temperature and ventilation should be between 25 and 29°C. The all-in-all-out system should be applied and there has to be enough pens to allow a cleaning period of seven days.

In larger units where piglets remain in the same pen system until they are nine to ten weeks old, **flat deck housing** is preferable. These pens are also often used for piglets that are weaned at three weeks. The floor should be covered with high quality plastic, woven mesh or perforated steel plate. The pen is installed over a flushing channel to help with cleaning and the removal of manure. Roof insulation is essential and roof and side ventilation must be kept regulated at a temperature between 17 and 25°C. The mixing of different litters may cause stress, which could lead to a drop of as much as 13% in the growth rate.

Grower and finishing pens

Pigs are normally moved from the weaner to the grower pens. The piglet should weigh about 30 kg at this stage and should have temperature requirements ranging between 12 and 18°C. Ad lib feeding is commonly used for grower purposes, which is the only difference between the grower and the finishing houses. In the latter kind, feed intake is limited. Two thirds of the waste generated by the production unit will come from these two buildings, therefore slatted floors over a manure channel is recommended. The groups of the piglets are transferred to the grower pen in its entirety. After the gilts have been taken out of the group, the remaining eight or ten pigs go to the finishing pens where they are kept until they are marketed. The handling of waste in grower and finishing houses is the same. Two methods are basically used, namely the clean flushing system and dry manure handling system.

Table 1: Space Requirement for Different Classes of Pig

Type of house	Boar	Sow before farrowing	Gilts	Sow with Litter		Growing - Finishing pigs (Kg)			
				Young	Mature	10-20	20-40	40-70	70-100
Farrowing House									
Pen size (min) m ²	1.858	1.858	1.580	4.460	5.948	-	-	-	-
Stall size (total) m ²	-	-	3.903	3.903		-	-	-	-
Stall Width cm	-	-	50.8	60.96		-	-	-	-
Growing-Finishing House									
Solid Floor (total) m ²						.46-.56	.56-.74	.74-.84	.84-1.11
Pigs/watering cup (hole)	1	10	12	4	4	20-25	20-25	20-25	20-25
Pigs/Feeder hole	1	2	3	1	1	4	3	3	3

Modern Feeding System



Automatic Feeding System



Automatic Watering System



PVC Confinement



Feed Storage



Feed Delivery System

FEEDS AND FEEDING OF SWINE

Dr. R. A. Sobayo

INTRODUCTION

Feed is any material, which after ingestion by the animal is capable of being digested, absorbed and utilized to satisfy metabolic needs i.e. being transformed into body elements of the animal. Importance of Feeds and Feeding in pig production can not be over-emphasized as it accounts for about 60-70% cost of production. Thus, much attention should be given to this aspect and the ability to judiciously manipulate feed ingredients to maximize productivity is therefore central to the maintenance of a stable pig production enterprise, for the enterprise to meet its set objective of profit maximization.

Nutrition- What is it?

Nutrition can be defined as the science involving various chemical and physiological activities which transform feed elements (nutrients) into body elements and activities. It can also be defined as the sum of the processes whereby an organism provides itself or it is provided with the materials (nutrients) necessary for energy release, growth, repair, various secretions, storage, transport, maintenance of internal osmotic and pH environment. It involves the ingestion, digestion, transportation, absorption and assimilation of the various nutrients and their transportation to all body cells and the removal of unusable elements/by-products and waste products of metabolism. Nutrition is one of the major constraints to survival and satisfactory productivity of livestock in this country.

TYPES OF NUTRITION

There are essentially two types of nutrition and these are:

(i) Autotrophic nutrition

(ii) Heterotrophic nutrition

(i) Autotrophic nutrition – occurs in organisms that are capable of synthesizing organic molecules from simple, inorganic materials such as carbon IV oxide (CO₂) and water e.g. photosynthesis

(ii) Heterotrophic nutrition – is the nutrition that involves dependence upon preformed organic molecules such as fairly complex, energy-rich organic molecules secured directly or indirectly from the environment e.g. pig nutrition.

THE NUTRIENTS

There are six groups of nutrients. Nutrient is the name given to the different components of feed that are useful to the body. Most feeds contain several kinds of nutrients but no one food has all that the body needs. Nutrients are any food constituents or groups of food constituents of the same general chemical composition that aid in the support of life. This implies that nutrients in feed are responsible for preserving life. They are:

(1) **Water** – constitutes:

- 65-70% - of body weight of animal at birth
- 40-50% - of body weight at slaughter

Swine – requires 5.68 - 11.36 litres of water/head/day and the quality and type of feed determines the water content of feeds.

(2) **Carbohydrates** – sources of calories or energy e.g. Yam, maize, sorghum, wheat, breadfruit, cassava, sugar, plants, body building.

(3) **Proteins** – used for protection, growth, tissue maintenance and repair. May also be used to provide energy e.g. meat, insects, soyabean meal, eggs, fish meal, groundnut cake, cowpea, milk.

(4) **Fats** – a source of energy and protection e.g. palm oil, coconut oil, groundnut oil, melon seeds, fish oil, butter, margarine.

(5) **Minerals** – regulates body processes, can be used for growth and replacement of tissue e.g. fruits and salt, leaf vegetable.

(6) **Vitamins** – regulate body processes, used as co-factors e.g. tropical leaf vegetables, fruits, root vegetables, carrot.

Classification of feeding stuffs

Feed or feeding stuffs can be broadly categorized into 5 as follows:

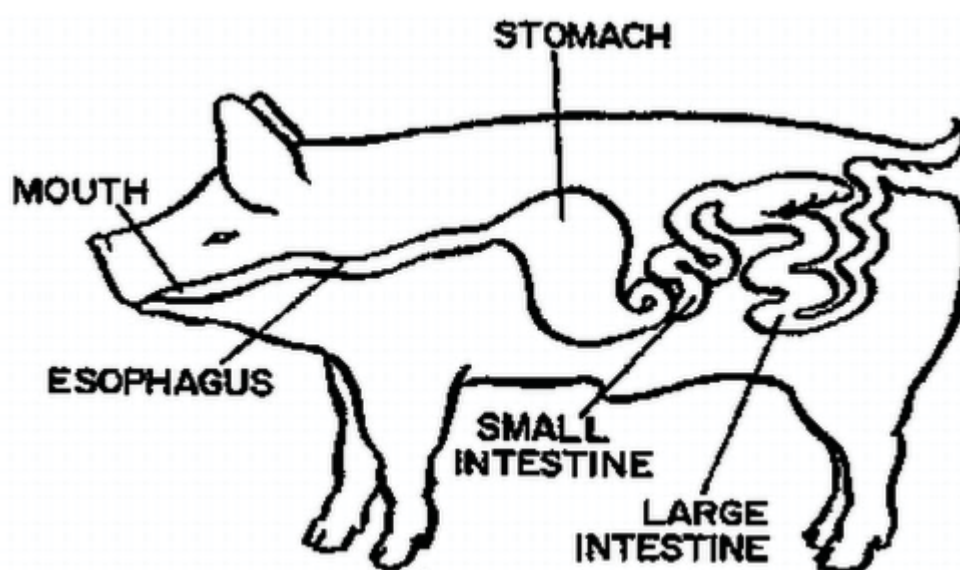
1. Energy sources, e.g maize, sorghum cassava etc
2. Protein sources, e.g ground nut cake, soyabean meal, fis meal etc
3. Mineral Supplements, e.g bone meal, oyster shell etc
4. Vitamin supplements
5. Feed additives or non - nutritive additives, e.g anti-biotics, egg yolk colourant etc

Processes involved in feed production

- I Feed formulation
- II Measuring of quantitative values
- III Crushing
- IV Mixing
- V Bagging

FEEDING MANGEMENT OF PIG

For a given no of animal species, the G I T very largely determines the types of food that will be nutritionally adequate. The relationship of the length of body to the digestive tract for wide range of animal usually provides a useful guide in the dietary formulation. Such a relationship length to length is about 1:4 for cat and chicken, 1:6 for dogs 1:27 for sheep and goat and 1:14 for swine. It follows therefore that the type of food most useful for chicken closely resembles those for cat and dog rather than for cattle and sheep. Pig is Monogastric (i.e single stomach) animal.



FEEDING OF PIGS

Dietary Switches

Pigs (swine) are usually fed in phases. Feeding management of pigs may be divided into the following:

1. **Creep Feeding**- At about 10th day of farrowing and when piglets weigh about 10kg live weight, piglets are fed Creep feed containing 24% crude protein(C.P)
2. **Weaner's Diet** - Immediately pigs are weaned and weigh 10-25kg live weight, Weaner's diet containing 22% C.P is introduced.
3. **Grower's Diet**- When pigs are 25-60% live weight, they are fed Grower's diet with 18% C.P.
4. **Finisher/ Fattener Diet**- When pigs are between 60-80kg body weight, they are given finisher or Fattener diet containing 14-15% C.P
5. **Breeder Stocks** are given the following diets:

- (a) At about 70kg and above live weight, pigs intended for breeding are given Breeder diet containing 15% C.P.
- (b) Lactation diet with 15-16 C.P is fed to gilt or sow after farrowing until the piglets are weaned.
- (c) Period between Weaning and Re-breeding- Usually, gilts and sow and occasionally boars are Flushed. Flushing is the provision of high energy and protein diet to breeding pigs to enhance the capacity of their ovaries to produce more ova or eggs during oestrous and the boar to produce virile and adequate volume of sperm.
- (d) Before Farrowing- A week before farrowing, both the quantity and quality of feed given to the pregnant pigs are increased. This provides the animals with food reserves necessary to cope with the stress that comes with farrowing. This practice is termed Steaming –up.

ALTERNATIVE FEEDING ARRANGEMENT

In Nigeria pigs are fed alternative or un-usual feed materials such as : cassava peels, kitchen waste (swill), brewery waste, palm kernel slurry, fish gills, cooked blood etc. This type of feeding encourages the production of pork with lots of fat though at reduced production cost.

TERMINOLOGIES AND DEFINITIONS

- (1) Nutrition – the science involving various chemical and physiological activities, which transform feed elements (nutrients) into body elements.
- (2) Feed – is a material, which after ingestion by the animal is capable of being digested, absorbed and utilized.
- (3) Feedstuff/Feed ingredients – a feeding stuff is any product, whether of natural origin or artificially prepared that when properly used has nutritional value in the diet. It includes natural feeds of animal origin, synthetic and other pure nutrients.
- (4) Nutrients – a nutrient is defined as any feed constituent or group of feed constituents of the same general chemical composition or a pure chemical compound that aids in the support of animal life. The constituents of a feed that are capable of being transformed into body elements are known as nutrients.
- (5) Ration or Diet – is a 24-hour allowance of feed or of mixture of the feedstuffs/feed ingredients making up the diet.
- (6) Feeding – is a practical application of nutrition, i.e. consideration of management, formulation, palatability, economics, etc.
- (7) Formulation – is the process of constructing a feed or diet formula.
- (8) Balanced diet – the food or feed that supplies all the essential nutrients in the proper amounts required for optimum performance of the animal.

-
- (9) Complete feed – a balanced ration for the animal in a single form. It provides all the nutritional requirements (except water) needed to maintain normal health or to promote production.
- (10) Basal (Energy) Feeds – nutritionally, basal feeds are mainly concentrated sources of energy being especially rich in starches and sugars. They are grains and grain by-products that contain not more than 16% protein and 18% crude fibre.
- (11) Supplement – is a feed or a feed mixture use with another feed to improve the nutritive balance of the total ration or diet.
- (12) Concentrate – is usually described as feed or feed mixture which supplies primary nutrients (protein, carbohydrates and fat). It is a commercially prepared supplement which refers to a concentration of protein, minerals or of vitamins in excess of those found in basal feeds. Have digestibility.
- (13) Forage or roughage – any material substance for feeding livestock, which contains more than 18% crude fibre, materials making up the fodder.
- (14) Anorexia – loss of appetite in disease condition.
- (15) Appetite – is a desire or inclination for food. It is a conditioned reflex. It is related to taste, smell and appearance of food. Well developed in man than in farm animals.
- (16) Additive – a substance (or mixture of substances) added to the feed to meet a specific purpose. An additive may enhance the nutritive value, sensory value or shelf life of the feed. Additive is involved in the production, processing, packaging and/or storage of the feed without being a major ingredient.
- (17) GIT – gastro intestinal tract, responsible for the digestion, absorption and assimilation of feed and nutrients.
- (18) Ration Formulation – this is the act of combination and re-combination in specific ratios of feed ingredients/feedstuffs to obtain feed for the nutrient requirement of farm animals.
- (19) Feed-mill – is an establishment/place where feeds/commercial feeds are provided using specialized equipment according to the feed formulation.
- (20) Proximate Analysis – this refers to the analysis of chemical constituents of feed, feed ingredients using established standard methodologies/procedures AOAC (1995).
- (21) Nutrient Requirements – this refers to specific requirements for nutrients by farm animals and this can be affected by a number of factors.
- (22) Anti-nutritional factors – these refers to chemical compounds/metabolites which interfere with the normal process of digestion, absorption and assimilation of nutrients from feedstuffs/feeds.

(23) Feed Microscopy – this is the science of identification, evaluation of feeds/feedstuffs by visual appraisal using a microscope, hand lenses. Essentially it involves physical and textural examinations.

(24) Nutrition evaluation – refers to the assessment of feed/feedstuff for its nutritional adequacy. This can be physical, chemical, biological or microbiological in nature.

BREEDS OF PIGS, SELECTION OF BREEDING STOCK AND PIG BREEDING

Dr. Olajide Mark Sogunle

BREEDS OF PIGS

Large White (Yorkshire)



This breed is originated from Britain. Yorkshires are the most recorded breed in the United States and Canada. They are white with erect hears and of appreciable body length. The pig thrives well under confinement conditions. It is best known for its large litter size and mothering ability. It is a docile tractable breed. Being one of the largest breeds, the gains are somewhat slower compared with other breeds. The carcasses are of excellent qualities.

Chester White



The Chester White breed is known for its mothering ability, durability, and structural soundness. For many years, Chester Whites have been popular with pork producers because of their extreme longevity. Packers prefer Chester Whites because of their white colored skin is easily removed during the harvesting process.

Berkshire



The Berkshire breed has long been known for its efficiency in gaining weight. The meat quality of the Berkshire is unique because it has a greater proportion of lean meat intermixed with streaks of fat. This intramuscular fat gives more marbling in comparison to other breeds.

Like all the swine breeds that end in 'shire', Berkshires have erect ears. In fact, the word 'shire' means erect. The Berkshire breed standard requires a pig to have a color pattern consisting of only black and

white hairs. The white points must appear on the nose, feet, and tail. These white points can be missing and any additional white points may appear on the body of the animal.

Hereford



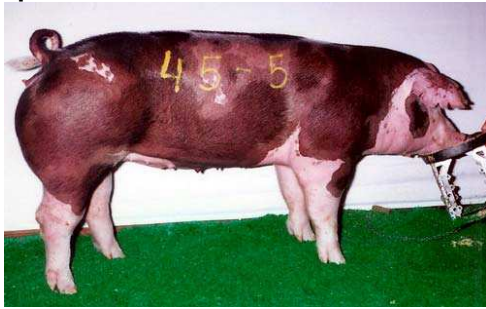
The Hereford breed originated in the 1900.s when a swine breeder crossed a Duroc, Chester White, and Poland. The Hereford breed was developed for its type, color, conformation, and superior feeding qualities. The Hereford breed standard requires a white face, and no less than two thirds of the pig's body to be red, exclusive of the face, ears, and at least two white feet. The white hair above the white feet must be extended at least one inch above the hoof. Hereford hogs are known for having a long neck, moderate jowl, medium sized floppy ears, and a medium length face.

Pietrain



The Pietrain breed originated from Belgium in the 1950.s and was later exported to other countries. Pietrains are moderate in size, have black spots with white pigmented hair around the black spots, and have moderately erect ears. Pietrains have shorter legs than most breeds, are low fronted, stockier in build, and are extremely heavy muscled. This breed's popularity has been up and down depending on market trends. Pietrains are known for having extremely high lean to fat ratios, with percent lean calculations in the high sixty percent range. Pietrains possess doubled muscled or bulging ham shape. They have poorer mothering ability and lower milk production than other breeds.

Spot



Spots are known for being fast growers, with good feed efficiency, and high quality carcasses. Spots are popular among commercial hog farmers for producing fast growing crossbred offspring.

Landrace



They are white and possess large floppy ears and longest body compared with any other breed. They have large litter size and very good mothering ability. The flesh is excellent for making bacon.

Duroc



They are sound and vigorous, very fast growing and profitable in production under varying production practices. The pigs are red and have short drooping ears and arched back. They are considered to be very good meat hogs.

Hampshire



They are medium size, black pig with a distinct white belt around the shoulders including the forelegs. They have high prolificacy and high survival rate of the piglets.

Indigenous Breed

They are small in size with a long snout. The pig has back swept ears and a straight tails. The most common colours are brown with black patches, brown, black, and black with gray or white patches. They are characterized by stunted growth, poor reproductive performance of average of about three piglets. They are very hardy and have sharp feet.

Large Black



The large black breed is a British breed. The pig has long well proportional with a good reputation for ham and bacon production. It is a long, black pigs with lop ears and is considered a good grazer and mothers. Growth rate tends to be slow and carcasses are relatively fat.

Tamworth



Tamworth hogs originated in England and are known for being a bacon type hog. Tamworths are thrifty, rugged, and deep sided hogs with a long neck, long legs, and a long nose. Tamworth females make good mothers in spite of the fact that they lack body depth. Tamworth hogs typically walk and stand with an arch in their back and they have medium sized erect ears. This breed should be golden red to dark red in colour, with straight hair.

Selecting Your Breeding Stock

The selection of the correct health status appropriate to your herd and location is vital before a breeding stock is purchased. The primary reason for purchase is to genetically upgrade your herd. Major requirements will be that they are available when you want them, in the numbers that are needed and at a price you can afford. But an overriding requirement is that they will not cause disease in your herd and lower your overall health status. At the onset therefore, consult with your veterinarian and ask him to determine at a veterinary level the information available about the proposed herd.

The investigations should include the disease history since its inception and those of any daughter herds that have been established from it. Also the health status and disease history of other herds it supplies. All veterinary reports should be requested and examined together with the results of tests for specific diseases and the frequency of such tests. The breeding history on the farm should be checked together with any evidence of infectious reproductive disease. A detailed study of records of production parameters, growth and food conversion rates may be helpful. The biosecurity of the breeding pyramid should be checked along with details of the health programme. The bio-security of the herd itself must be assessed including the methods by which pigs or genetic materials are brought into the herd. Finally a written veterinary statement should be obtained indicating that on both clinical and pathological grounds those selected diseases that you wish to keep out of your herd have not been diagnosed in the donor herd.

Buying breeding herd - The ground rules

Step 1 - Select the source based on:

- Availability.
- Genetics (including fecundity).
- Health.
- Market acceptability.
- Quality control.

Step 2 - Determine with your veterinary advisor the health status of your own herd.

Step 3 - Request veterinary liaison with the suppliers' veterinarian and get clarification of the health status of the donor herd.

Step 4 - Assess the compatibility of health status.

Step 5 - Determine the isolation requirements for incoming stock.

Step 6 - Decide on vaccination and acclimatisation procedures.

The donor herd

The suppliers may want to know the health status you require and offer you a choice of sources. Always purchase from a DHHS herd or equivalent if available.

What are the methods and risks of pig movement since incoming pigs are probably the greatest potential source of infection to your herd, the methods by which they are introduced or other methods by which you improve the genetic potential of your herd are vitally important.

Five methods suffice:

1. By introducing live pigs.

2. By segregated early weaning SEW.
3. By hysterectomy.
4. By embryo transplants.
5. By artificial insemination (AI)

RISK LEVELS IN BUYING PIGS			Risk Level
DHHS pigs	→	Moved via isolation into the herd with veterinary liaison and testing.	Very Low. Risk confined to a possible prolonged incubatory state e.g. EP, PRRS.
DHHS pigs	→	Moved direct into the herd.	Low Risk.
Conventional health status pigs	→	Moved in direct with veterinary liaison	Moderate Risk.
Unknown health status pigs	→	Moved direct into herd. No veterinary liaison.	High Risk

Live pigs

a) Mature gilts and boars

Live pigs can be brought into your herd from a source herd of matching health status, or through SEW or hysterectomy and fostering if the source herd is of known but lower health status (depending on the disease to be eliminated).

If live pigs are brought into your herd with or without SEW it is advisable to hold them in isolation for a period before integrating them into your herd to check whether they develop disease and whether disease breaks out in the source herd. If the isolation premises are in a different site to your herd and not of the same biosecurity standards as your recipient herd, there could be a greater risk in holding them there rather than integrating them directly into your herd. The dangers of integrating them directly into your herd are obvious, namely, that if they are incubating an infectious disease sub-clinically then ultimately your herd will become infected. Perfect separate quarantine facilities are rarely available to commercial herds, particularly smaller enterprises but isolation that falls short of complete quarantine (e.g. on the same site) can be surprisingly effective. The incoming stock could be moved into a separate building on the same site preferably over 50 metres distant and this should be reasonably effective, provided separate boots and coveralls are used to tend the animals and provided the drainage from the building does not flow into your other pig buildings. If a separate building is not possible then a separate room sealed off from the main body of the herd is better than direct integration into the herd.

How long should the incubation period be? Here the importance of veterinarian liaison to match respective health status has already been highlighted.

If your herd is believed to be enzootic pneumonia (EP) free then it is advisable to place the incoming animals in isolation for a period of eight weeks. At the same time sentinel pigs (i.e. pigs from your herd due for slaughter) should be moved in and blood tested and / or slaughtered prior to the entry of the new pigs and their lungs examined for EP freedom. If your herd is not free of EP, the length of isolation is debatable. Some veterinarians would advise six weeks but four is more practicable.

Should enteric or respiratory disease appear during the four week period either in the pigs in isolation or in the source herd the chances of preventing further damage by immediate slaughter would be reasonable.

b) Breeder weaners

Instead of buying in mature replacement gilts and boars you could buy in so-called breeder- weaners, say, 30kg live weight. This has the advantage of allowing them a long period of acclimatisation to your herd before you breed them. It also enables you to rear them yourself in the way you think best for future breeding gilts and allows you to carry out your own selection at slaughter weight. A disadvantage is that boars cannot be performance tested and therefore it is not feasible. Also, if you sell your pigs at 25-30kg or at weaning, you probably do not have the facilities to rear such pigs.

The advantages of buying in breeding stock at a commercial level, compared to the selection of the home produced gilt are its low cost, the availability of gilts when they are required, the genetic potential is constantly improved and if done carefully presents few problems. Some farms however prefer to breed their own breeding females and thereby only introduce into the herd, a small proportion of grand-parent females and boars. This policy often fails because of the difficulty of rearing the future female replacements within a commercial operation, the poorer reproductive performance and the fact that the gilts reared on the farm are often not available when required. This system is also a high cost one and often results in lower numbers of pigs reared. Extensive experiences have shown that provided there is good health liaison and sensible practical procedures then the herd health status can be maintained with the purchase of breeding stock.

Segregated early weaning (SEW) - Modified Medicated Early Weaning (MMEW)
The second method of bringing in live pigs from another herd is through a modification of the medicated early weaning (MEW) technique called by many segregated early weaning (SEW) and by one breeding company Isowean. This is based on the principle outlined earlier under "How infectious agents are spread". By the time females reach their first farrowing they have developed a strong immunity to the more serious enzootic pathogens in the herd and have eliminated most of them. Furthermore they pass such a strong maternal immunity to their offspring that the piglets are resistant to infection by most of these pathogens for varying periods depending on the pathogen. Thus if they are weaned immediately from the sow and moved to isolated premises at the appropriate age they will be free of the pathogens you wish to eliminate.

Thus if you wished to obtain future breeding stock from a particular herd but your veterinarian thought that the general health of that herd was below that of your own you could obtain higher health status pigs free from the unwanted pathogen. If the pathogen you wished to avoid was *Mycoplasma hyopneumoniae*, (enzootic pneumonia), you could vaccinate the dams in the donor herd ahead of time to boost their immunity, put the sows and newborn piglets on an anti-mycoplasma medicine such as tylosin or tiamulin and wean the pigs at ten days to the isolation facility on your farm. Isolation is necessary because if an unknown pathogen enters the donor herd it could go through the SEW system during the incubation period.

Hysterectomy and fostering

The fourth method of introduction of live pigs is through hysterectomy and fostering the piglets onto a newly farrowed sow in the recipient herd. This operation is carried out on day 113 of pregnancy when the sow is slaughtered. The womb containing the piglets is either removed 50 meters away to a pig-pathogen-free environment where the piglets are removed or it is passed through disinfectant trap into

a sealed room. The litter is then immediately taken into the recipient herd and suckled onto a newly farrowed sow. If done properly the mortality rate is as low similar to that of your naturally farrowed piglets.

The whole operation is synchronised using prostaglandins so that newly farrowed sows are available to act as foster mothers. Ideally the sow selected for the operation should be moved into isolation approximately eight weeks prior to the due date and monitored for evidence of disease. At the same time it should be blood sampled and tested for aujeszky's disease (AD) (pseudorabies), swine influenza, PRRS and other relevant diseases that could pass through the placental barrier including leptospirosis and brucellosis. The reason for blood testing for these diseases is that they are capable of passing from a recently infected mother to her piglets in the womb. This is most unlikely to happen with aujeszky's virus and PRRS if they are obviously immune, but it could happen with *Leptospira bratislava* and possibly *L. pomona*. If a sow is serologically positive for leptospira the risk can be diminished by treating her with either streptomycin or amoxycillin antibiotics prior to hysterectomy. If a sow is sero-positive for brucellosis it is better to discard her. It would appear also that porcine coronavirus does not cross the placenta and hysterectomy pigs from positive herds can be introduced into negative herds safely.

Hysterectomy is a safe procedure and in many hundreds of operations known to the authors there has been no evidence of transfer of disease.

Embryo transfer

Embryo transfer has been used successfully in several countries for the introduction of new genes but it has not been widely adopted probably because it requires two skilled teams, one to flush the fertilised eggs from the donor sow and one to insert them in the recipient sow. It has not been performed on anything like as big a scale as hysterectomy and fostering and therefore there is not the volume of field evidence to underline its safety, but in theory and on the limited evidence it is safe.

Its drawbacks are:

- (1) It needs two skilled teams,
- (2) It requires immaculate synchronisation and timing,
- (3) The embryos cannot be kept viable for more than a few hours and
- (4) Unless done expertly, it results in a high failure rate and small litters.

Note: For practical purposes, SEW, hysterectomy and AI are much simpler.

Artificial insemination

The sixth method of introducing genes is by artificial insemination (AI). It is known that viruses of swine fever, aujeszky's disease, PRRS, parvovirus, and leptospira bacteria and *Brucella suis* could be introduced through AI mainly during the early stages of infection of the boar. If the boars first go thorough a true quarantine procedure and are screened for these infections then housed in an isolated AI stud (i.e. one in a secure location), with high standards of biosecurity and hygiene during the production of semen, then field experience indicates that the risks are very small. The advent of frozen semen, which hitherto has been largely unsatisfactory but which is now looking more promising,

renders the use of AI much safer since the semen can be stored for a month or two, time enough to be sure that no new infection was incubating in the AI stud. AI does however, have the disadvantage that only half the genes are introduced into the herd.

PIG BREEDING AND FARROWING

One of the most important aspects of pig production is getting young piglets off to a good start. For this reason it is essential that the management and stockmanship of a farm is maintained at the highest possible standards. The pictures below illustrate some of the critical operations required to achieve this.



The young piglets shortly after birth need to be kept at a temperature close to 30 degrees centigrade and are kept warm under an infra red lamp. Bedding also helps to keep them warm and create their own microenvironment. Notice how the piglets huddle together, this is a natural form of behaviour.

Feeding time

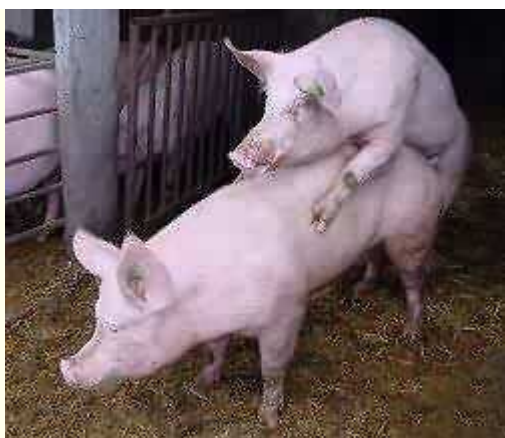


The crate that the mother pig (sow) lives in for the first few weeks of the piglets' life prevents the sow rolling over and crushing the young piglets to death. For the first two or three days piglets are vulnerable as they weigh just over a kilo compared with the sow at 250 kg.



Young piglets at feeding time

After the first two days of life, piglets have their own teatlet that they suckle from. A good sow will have 14 functional teats. Milk yield tends to be higher at the front of the udder compared with the back. Piglets are normally weaned at around 4 weeks of age which is an optimum time for both the welfare of the sow and the piglets.



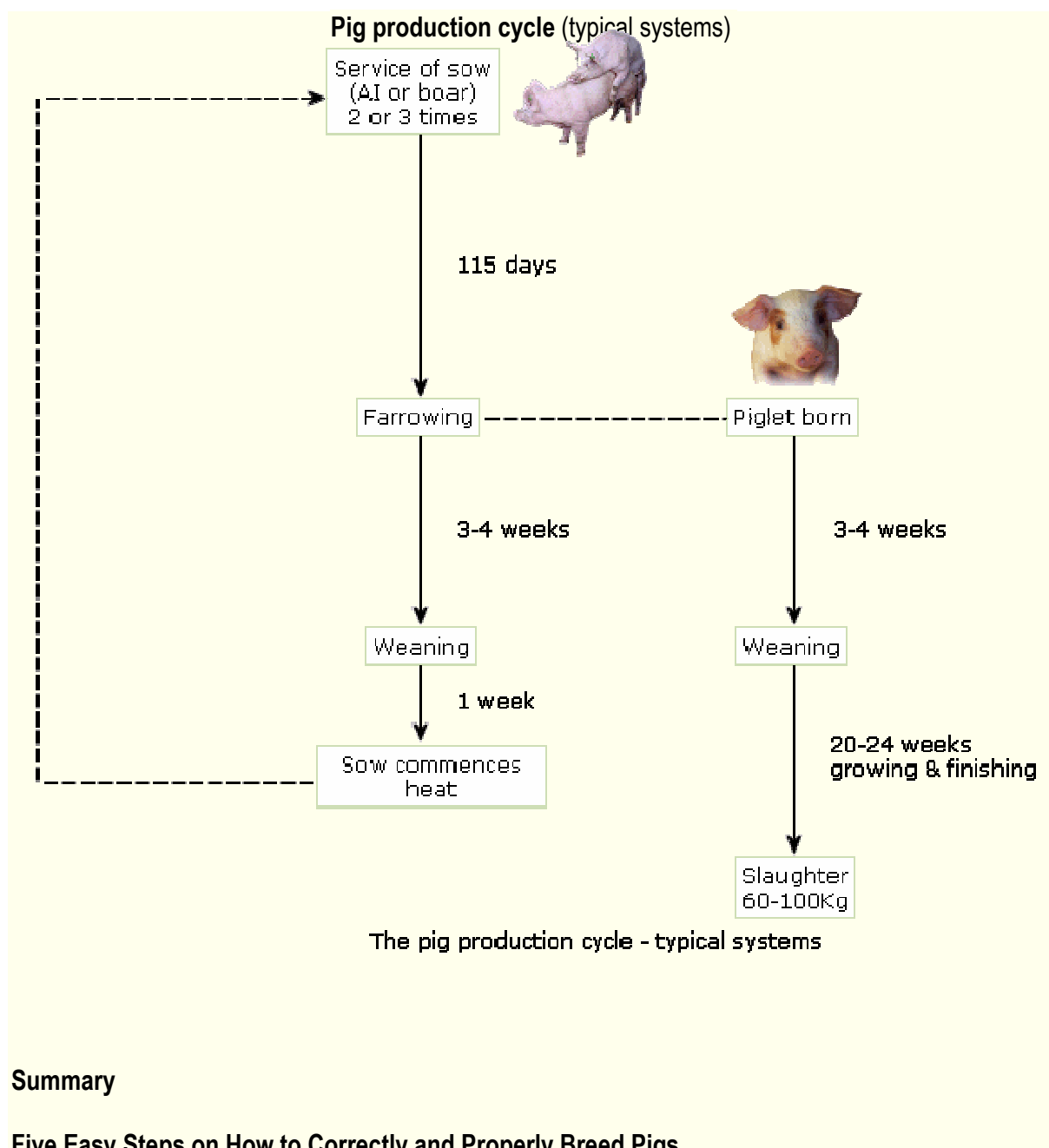
After weaning the sow dries off. Sows normally come on heat (exhibit oestrous) within a week. They are then mated either naturally with a boar or with artificial insemination (AI) or with a combination of both.



At feeding time sows can either collect feed automatically from a feeder or they can be fed on an individual basis as in the picture. The individual feeder allows the sow to eat without interference and stress from her pen mates and provides the farmer with a good opportunity to check her health.



The farmer may also check whether the sows are pregnant using the ultrasonic microphone as illustrated.



Summary

Five Easy Steps on How to Correctly and Properly Breed Pigs

Why are pigs one of the most ideal animals to breed? Why do farmers include pigs in their list of animals to breed for money and business? This is because breeding pigs doesn't take up too much time and pigs are capable of producing large litters. They have a short gestation period and it normally would only require a few boars or male pigs to mate with many sows or female pigs. If you're interested in breeding pigs for business and would like to have a good and fresh start, here are steps on how to care for pigs correctly and properly breed pigs:

1. Remember that you don't have to buy too many boars to breed. You can just buy a single boar, ideally a year in age, and have him breed with about 30 to 50 sows that are either housed in stalls or in a large pasture.
2. Always begin your breeding business with research. You need to know who to go to in order to buy

the best boars for breeding plus the best and most fertile sows that can produce large litters that are not only healthy but that have the best qualities. You can either browse through the yellow pages for names of pig breeders or visit and get referrals from well-known stores that sell pigs and pig feeds.

3. When breeding pigs, select sows that are at least 9 to 10 months old as this is the ideal age for breeding. For the boars, you can either buy them when they're at least 8 months old if you have a small number of sows then breed them with a larger number as they grow older. Again, the older the boars are, the larger the number they can mate with.

4. Sows need to undergo physical check-ups to make sure that they have no infections or health problems that could produce problematic litters. You should also perform these check-ups to see if the sows are ready to mate. For instance, to check if the sow is ready, look at the vulva and see if it is swelling as this indicates the start of its fertility period. Young sows can be bred on their first day of fertility while older ones can begin on the next day after checking.

5. In breeding pigs, gestation lasts for about 113 days, so breed the pigs during their fertility periods until pregnancy has been successfully achieved.

PIG REARING AND MANAGEMENT **PIG PROCESSING AND MARKETING**

Dr. Olufemi S. Akinola

PIG REARING

Good stockmanship is a basic requirement for successful livestock production. The animals must be given adequate care before the farmer can expect his animals to produce to optimum capacity

1. Daily Routine

a. Supply of water: Involves removing the left-over water of the other day, cleaning the trough and supplying fresh clean water. This should be on a daily basis. It is advisable not to add medications to pig's water in the watering trough. If medications is to be given in water, it should be in separate container.

b. Feeding. Feeding should be done immediately, after supply of water. Dry feeding is preferred for convenience and health. If wet feed is supplied, it should be done only for between 30minutes to 1 hour. This is because wet ferment quickly and become breeding ground for flies and micro-organisms which may result in disease condition. Feeding can be done one or twice daily. Medications can be added to pig feed.

c. Cleaning: This is done after feeding and allowing the pigs some time to defaecate. With this, the pen is more cleaner and easy to handle.

d. Observation: The best time to observe the animal is when they are not feeding. Animal can be observed for any sign of discomfort through which animals with injury, animals on heat and those with disease conditions can be detected.

2. Management of Pregnant sows;

Once the gilt/sow has been successfully served, conception will occur. The gestation period is 114 days (3 months, 3 weeks and 3 days). Frequent checking of sows should be carried out to detect any that has returned to estrous. Pigs should be kept in small groups to ensure that they all have access to adequate feed. Well fortified feed should be offered in order to supply need of both the mother and her foetus. Green leaves and vegetable is particularly important. Pregnant sows should be shielded from extreme of heat through the provision of shades and wallows.

3. Farrowing and care of new born Piglets:

The pregnant animals should be dewormed 2-3 weeks prior to farrowing to reduce the possibility of the dam passing worms to the new born piglets. Also the sow should be in the farrowing unit 4 to 5 days prior to expected farrowing time to allow for adjustment to the environment. Constipation in the sow must be avoided at all cost as this interferes with farrowing process. Supplementations of bran and green stuff during the last week of pregnancy are recommended.

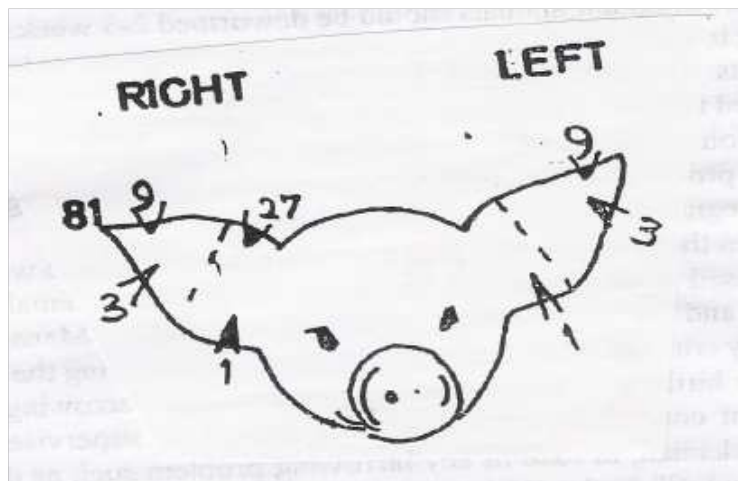
Sign of Farrowing:

1. increased restlessness
2. making of nest by arranging her bedding

Management is critical at this time since piglet losses occur during the first 72 hours after birth. Farrowing should be supervised by a trained stockman, in case any farrowing problem such as delayed farrowing and still-births. With special care and attention to dam and her litter, up to 95% survival of piglets to 8 weeks of age can be realised.

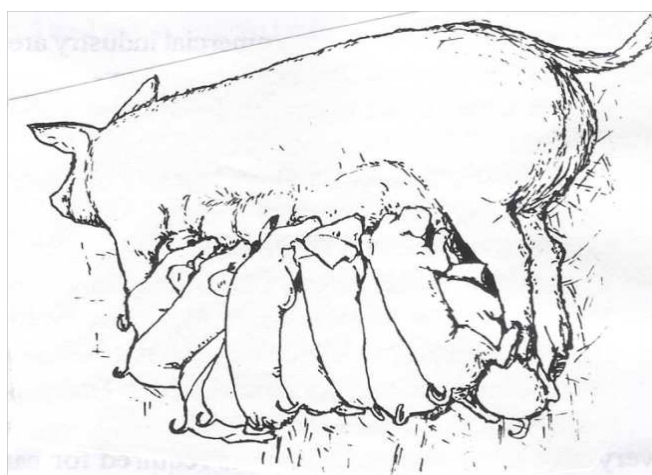
Many losses of newborn piglets are caused by stress due to chilling. The stockman must be ready to prevent this by providing extra source of heat. Also piglets must be encouraged to obtain their first successful suckle of colostrum within 45 minutes after birth. Colostrum is the most important food a piglet takes in during the first few hours of its life, because it is a source of both essential energy and antibodies. Failure to obtain colostrum will invariably result in susceptibility to disease and death of the newborn piglet.

With 24 hours of birth, the individual piglet should be marked for identification and record purposes. Ear-notching is the most reliable system. It is also desirable to clip the needle teeth to prevent potential injury from fighting each other and damages to udder of the dam. Tie off the navel cord and immerse in dilute solution of iodine, this reduces the possibility of navel infections.



A Ear-notched pig

Since sow milk is very low in iron, oral or injectable iron preparations are administered to the piglets in confinement to reduce the development of iron deficiency anaemia. In the absence of iron preparation. A shovel of red (iron rich) soil thrown into the pen has been known to be source of iron for piglets under Nigerian conditions, but this may not be adequate for growth. Injections are made prior to 5 days of age, while oral preparations to the piglets are usually given continuously in soluble form. Male piglets not retained for breeding should be castrated after one month of age. The piglets can gradually be introduced to creep feed after two weeks.



Dam suckling piglets

Weaning:

Weaning is the practice of separating the young pigs from their mother. It usually exerts stress on the young. Weaning is normally accomplished when pigs are from 6-9 weeks of age, when they should be capable of subsisting on solid feeds and feeding for themselves. Body weight and health condition are better criteria than age per se. Exotic breeds should be weaned at weight of 5-6kg. It must be emphasized that superior management, rigid environment control and continuous attention to minute details are essential for success in this phase of growth.

Other changes should be gradually effected at weaning. Do not abruptly change the ration, but for a few days, continue feeding creep feed mixed with weaner ration and the finally eliminate the creep feed completely at about two weeks after weaning.

Early weaning

Recent developments in the commercial industry are in favour of early weaning at about 4 weeks.

The advantages are:

- a. losses in piglets due to overlying and starving are significantly reduced.
- b. pigs can be adequately fed, and lack of uniformity in a litter can be overcome.
- c. cost in sow feed can be slashed
- d. the sow loses less weight during nursing
- e. the dam can be re-bred sooner to produce more litters

- f. better producing sows can be retained for longer period.
- g. early weaning allows for streamlining of the production and market supply; both weaners and market hogs can be sold.

A very high level of management is required for early weaning and therefore it is not a general practice. However, a technique of 'split' weaning can be beneficial, whereby the large piglets are weaned first and the small ones are left with the dam and weaned later.

Weaners and Growers

The 3 week period immediately after weaning is a critical one for the young pigs because a number of stresses may be encountered. After pigs have overcome the stress of weaning and are feeding properly, deworm them for the first time. Group the pigs according to age and size. Large litters should be grouped together. This provides an opportunity to record their feed consumption up to the time of selection (at 5 months of age) and enhances the determination of feed efficiency. Sick pigs should be separated for treatment. If there is need, some weaner pigs can be sold at two months of age. Other (not for sale) can be raised on self-fed rations until the finisher stage. At the age of five months, the live weight of a fully grown pig should be 64-80kg.

This means the pig is expected to gain 0.55 to 0.68kg per day over a period of three months. By then a healthy pig should be sexually matured. Separate gilts and boars because the boars usually start ranting. This is the time to select which pigs should be kept as replacements in the breeding herd and which should be finished for market.

Record Keeping

The keeping of accurate record is absolutely essential for the success of any pig enterprise. It gives a clear picture of the type of operations, so that the exact degree of success can be measured.

Therefore, a good record of the number of pigs in herd, feed consumption, mortality, medications and sales, should be kept. Also on reproduction, details of; boar performance sow productivity, weaners growth and grower/finisher efficiency should be recorded.

Health Management

A disease outbreak in a piggery can have disastrous consequence. The management practices already described, if carefully followed, will minimize occurrence of disease. That prevention is better than cure is very relevant in the pig industry.

A clean, sanitary environment provides the best prevention for internal and external parasite which can be serious problems. Confinement prevents pigs from contaminated fields and dirty lots. Anthelmintics and other drugs, when properly used, aid in elimination of parasites. Antibiotics also protect pigs against disease proliferations and reduce disease outbreaks. They can also promote growth in pigs when given at recommended levels. For diseases that can be prevented through vaccination, a Veterinarian should be contacted to provide such services routinely.

A basic knowledge of the main disease which may affect a pig is necessary so that producer can identify and put in place control measures as quickly as possible. Some of the diseases and parasites that affect pigs are:

1. Parasites: These are organisms that live on (external parasites) or in (internal parasites) an host (another organism) in order to obtain food. External parasites mainly cause irritation to the skin surface, often leading to wounds and increase susceptibility to other infections. Common ones are flies, ticks, lice, mange mites, etc. The internal parasites are more common to pigs on free-range. Example is the

round worm (*Ascaris Lumbricoides*) which causes lots of damage to pig herds. They can grow up to 300mm long and 6mm thick in the small intestines. Heavy infestation leads to inherent piglets weakness and loss of weight. Others harmful worms are tapeworms, e.g taenia solium, which has the pig as its intermediate host, while the adult worm lives in man. Pig become infected by picking up eggs from human faeces and larvae then encyst in the pig's muscle. To prevent worm infestation in pig herd, avoid contaminated water and feeds. Clean and remove faeces always, deworm with broad spectrum antihelminthics as recommended by your veterinarian.

2. Hog Cholera: this is a highly contagious and acute viral disease of pigs and frequently fatal. The spread is by animal contact, contaminated urine and faeces or other body secretions.

Symptoms are:

- I. Loss of appetite in affected animals.
- li Inflammation of the eye
- iii High body temperature
- iV Severe diarrhea
- V Discharge in the eye causing eyelids to stick together
- vi Trembling and incoordination
- vii Death often result after 7-8 days.

Control: There is no effective treatment except vaccination programme to be instituted if there is danger of hog cholera infection. Avoid contact with infected animals.

3. African swine Fever: this is also a very contagious viral disease which in acute form can cause up to 100% mortality.

Symptoms:

- I. Pig are found huddling together
- ii. Loss of appetite
- iii. Small purplish blotches found on the skin
- iv. Incoordination and laboured breathing. Haemorrhages at the trotters which can lead to lameness.

It is spread by bush pigs and warhog which carry the virus, though they are immune to the disease. Contact with other sick pigs and consumption of contaminated feed and water.

Control: Infected pigs should be destroyed and properly disposed off. There in no effective vaccine as at now.

4. Swine Influenza: A highly contagious respiratory disease cause by the influenza virus. Stress due to rapid changes in temperature trigger off the disease. Mortality is normally low, but it result in stunting and reduced live weight gain.

Symptoms: Jerky breathing, cough, high temperature, loss of appetite and rough hair coat appearance. Secondary infection with bacteria complicates the condition.

Control: No treatment or prevention vaccine available, but good management and avoidance of stress can limit outbreak.

5. Enteric Colibacillosis: This is the most common cause of death in baby pigs, especially within the first ten days. The bacterium *Escherichia Coli* (*E. Coli*) commonly found in the intestinal

tract causes the disease. Toxins are produced which stimulate a massive fluid loss in to the small intestine leading to scours and dehydration.

Symptoms:

- i. Scouring.
- ii. Dehydration
- iii. High mortality rate
- iv. Staggering movement

Control:

- i. Avoid stressful condition.
- li. Give oral administration of antibiotic immediately.
- lii. Ensure good farm management
- iv. Proper feeding of balanced ration
- v. Piglets must be given colostrum.

6. Salmonellosis: It is a disease of the intestinal tract causes by salmonella spp. of bacteria. Pig of about two months are most affected. Heavy worm infection triggers it off.

Symptoms:

- i. Foul smelling diarrhoea.
- ii. Pigs become gaunt.
- lii. High temperature in affected pigs
- iv. some death usually occur in a group

Control:

- i. Ensure good management
- ii Practice high level of sanitation
- iii Feeding of antibiotics and sulpha drugs.

7. Erysipelas: This is caused by a bacterium agent which lives in the soil pigs can pick up the agent from soil or by animal contact and even humans. In the acute form, sudden death is common.

Symptoms:

- i Sick pigs show marked constipation
- ii high temperature (41-42°C)
- iii Reddish-purple discoloration of the ear, abdomen and legs
- iv Chronic stage leads to arthritis swollen joints, stiffness and heart damage.

Control: Routine vaccination programme is recommended and once the disease is diagnosed treat immediately with antibiotic.

Processing and Marketing

Processing

The ability of pig industry to market large quantity of pork is a necessary condition for commercial growth of the industry. Processing outfits are capable of buying many animals at a time,

process them into different products and distribute these products to any part of the world. Processing starts with the slaughtering process.

1. Slaughtering:

The standard slaughtering procedure involves:

- I. Stunning- Mechanical with a captive bolt pistol or electric which involves electric current for one second through the brain of the animal.
- II. Bleeding – the stunned animal is hanged on its hind leg on a hoist. The neck is cut in such a way as to sever all veins. Blood can then be collected in a clean vessel.
- III. Scalding – immerse in hot water at 65-75°C. Once the hair is loosed, it is crimped with a knife. Excess hair is singed off with a flame.
- IV. Evisceration- To remove the gut, a long cut is made below the belly of the animal. The entire length of the gut should be removed intact to avoid contaminating the rest of the carcass. The gut is eviscerated away from the carcass.

2. Meat Hygiene:

It is important that slaughtering facilities maintain high sanitary conditions because the products of slaughtered animals provide an ideal breeding ground for bacteria. The carcass should be chilled immediately after slaughter.

Refrigeration trucks in good working conditions should be used in transporting meat over long distances. It is necessary to provide for meat inspection in slaughter houses in order to ensure that only healthy meat is approved for sale to the public. Meat slaughtered on the farm should also be wholesome and measures taken that no disease is circulated from the dead to the living.

3. Carcass Evaluation and meat quality:

The commercial pork industry has standards for carcass which may vary from country to country.

However, the basic criteria involve the following considerations:

- I Conformation: this is the shape of the carcass. It is desirable to have carcass that is well developed in the more valuable meat area such as the ham and the loin.
- ii Lean Content – the amount of lean meat is a very important quality factor
- iii Fattiness – too much fat in pork is generally not valued. Fat thickness can be measured in selecting animals for breeding
- iv Colour and Texture – very pale watery meat is undesirable. This can occur and is associated with a condition known as pale soft exudate (PSE) which can result from a genetic cause or poor pre-slaughter handling.
- v. Flavour and Odour – off-flavour and odours can arise from feeding high fishmeal diets or rancid fats. Boar taint can also occur in the meat of entire males.

Further processing, makes it possible to harness all the by-products and convert to other uses as:

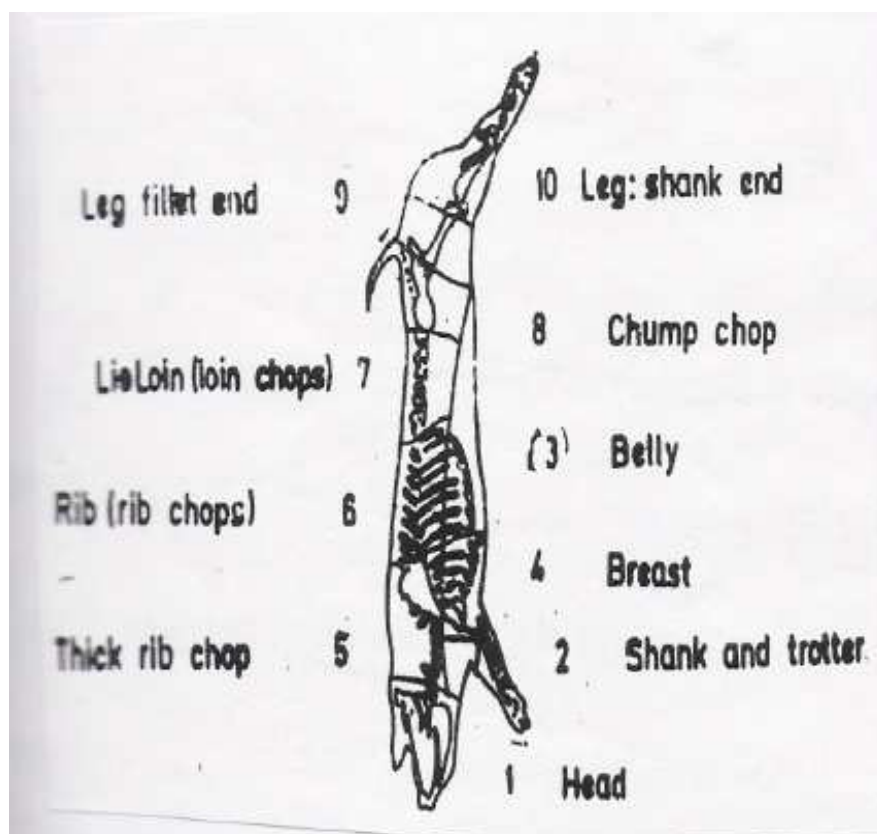
- ▲ Bristles – for use in shaving and paint brushes
- ▲ intestines – for use as sausage casings
- ▲ blood – can be processed into human food or animal feed.

- ⤴ Hoofs – used for gelatin and glue products. All these are usually wasted under the prevailing pig marketing and slaughtering conditions in the tropics.

Pig meat products

In most tropical countries, all the parts are valuable meat, including the head and trotters. However, the more meaty portions usually fetch higher prices. The meat can be further processed into the following:

- ⤴ Cured meat – e.g the bacons and hams which are cure in brine. Further flavouring is enhanced by smoking. These processes increase the shelf-life of the product and therefore should be promoted in the tropics where refrigeration facilities are often non-existence in the rural areas.
- ⤴ Sausages and Pies – these are derived mainly from trimming and offal that are left after cutting up whole parts.



- ⤴ Pig skin – can be processed into leather or surgical strings.

Pig carcass showing wholesale parts

Marketing

The ability to market pigs at the right time is a major determining factor to the success of commercial pig production. A recent international conference on pig production in Nigeria identified marketing as the number one constraint to increased commercial pig production. Small holder farm have not problems as per marketing, but the commercial farmer have to put

marketing a major issue determining their success. Pig can be marketed using the following market outlets;

- a. Private Sales: these involve selling of one or more pigs to the local consumer, other pig producers, butchers or middlemen. The pigs are sold live and prices are normally subjected to bargaining. This method is most common among rural small-scale producers. It has the advantage of being the simplest. To ensure adequate prices for pig farmers, marketing cooperatives are recommended.
- b. Public Sales: in these methods, pigs are taken to a central place, where they are sold by auction on live basis to the highest bidder.
- c. Direct Sales to Butcher: the pigs are sold to the butcher directly by producer without middle men. The method is more applicable to the large scale producers. Fluctuations in prices can be serious problem in this system of pig marketing.
- d. Contract Sales: Under this system, contract is entered into with an abattoir to supply a certain number of pigs over a period of time at a set price. This condition allows the producer to plan this production strategy over a fairly long period of time. Fluctuation in input prices however, can be a problem in this system.

Transportation

Care must be taken while transporting pig to the market or slaughter house. Excessive stress on the pig can lead to mortality in transit.

- a. Pigs to be transported should not be fed 12hours before loading
- b. Provide a loading ram if many pigs are to be transported at once to the market. The loading ram should be properly designed to be at the same height with the cart, truck or trailer.
- c. Handle pigs with uttermost care
- d. Spray with cold water before loading, if possible. Load and Travel in the cooler part of the day. In the early in the morning for short journeys and in the night for long journeys.
- e. the truck to be used should be covered but with provision for adequate ventilation and bedding on the floor.
- f. Avoid mixing pigs of different sizes, ages and herds. Similar considerations should also apply at the lairage (i.e. where pigs are held prior to slaughter). The pigs should be handled and driven with care.