

# Training Manual: The Basics of Financing Agriculture

---

Module 4.6 | Livestock Analysis: Pigs

# Acknowledgement

---

*The Agriculture Finance Training Manual is part of AgriFin's Agriculture Finance Training Tools. The Manual was developed by [IPC](#) - Internationale Projekt Consult GmbH as part of AgriFin's technical advisory project for Cameroon Cooperative Credit Union League ([CamCCUL](#)).*

# Terms of Use

---

*Content from this manual may be used freely and copied accurately into other formats without prior permission, provided that proper attribution is given to the sources, and that content is not used for commercial purposes.*

# Session Overview

<b>LEARNING OBJECTIVE</b>	<b>An understanding of the life cycle of pig production will help an Agriculture Loan Officers (ALOs) analyze and advise a farmer's loan application for Pig Farming effectively. This session is based on the techniques discussed in the session 4.4 Analyzing Livestock Production.</b>
<b>SCOPE</b>	<p>By the end of this session, the trainee be conversant with the following principles of pig and other livestock management:</p> <ul style="list-style-type: none"><li>• Understanding pigs in the context of pig farming</li><li>• The different varieties of pigs and how each breed should be managed</li><li>• The needs of pigs in terms of feed, housing, and safety</li><li>• Assessing pig farmers for loan sanctions</li></ul>
<b>TARGET</b>	Agriculture loan officers, trainers, agriculture experts with limited financial analysis training, and other professionals interested in agriculture financing
<b>DURATION</b>	3 hour



# Contents

---

1. General Production
2. Pig Production
3. Systems of Breeding
4. Pig Housing
5. Management Systems
6. Reproduction
7. Diet Formulation
8. Pests and Diseases
9. Liquid Manure
10. Poor Performance Factors
11. Cost of Production (XFA)
12. Assessment

# 1. General Production

---

The profitability of pig production varies considerably from country to country. Regardless of whether a prospective producer in the tropics is planning a small or large enterprise, he should ask himself a few basic questions in terms of resource, time, market and breeding systems.

According to FAO the estimated global pig population in 2010 was 966 million, meaning there is 1 pig for every 7 people in the world. Although pigs are fewer in number than some other domestic animals, more pork is produced than any other meat.

Extensive farming systems create various problems:

- Disease transfer
- Poor health control
- No reproduction control
- Pollution
- Crop destruction, etc.

# 1a. General Production – Origin

---

The pig was probably domesticated from the Eurasian wild boars *Sus scrofa* & *Sus vittatus*.

*Sus vittatus* is a wild pig of East & South East Asia that was domesticated 5000 years ago. Modern breeds are a cross between these two wild species. Pigs originally colonized areas of the forest and swamps and thus evolved to live in a moist, shady environment.

Biblical writing indicates pigs were first domesticated as early as 2000 BC. Man has domesticated the pig for meat and fat (lard). Latest technologies indicate that under controlled environmental conditions, pigs can be reared anywhere.

# 1b. General Production

---



## 2. Pig Production – Uses

---

1. Raw materials for industry (bristles – toothbrush, fat – oils, soaps, food)
2. For domestication
3. For foreign exchange through exports
4. Manure to fertilize soil for farming



# 3. Pig Production – Breeds

---

European breeds, American breeds and local breeds + cross-breeds

In Cameroon, the main breeds are:

- Large white, Hampshire and Berkshire (from the UK)
- Landrace (from Denmark)
- Duroc (from the US)
- Local pig breeds: Bakweri and Bamilike



# 3. Pig Production – Breeds

---

**Landrace**: white, large drooping ears, long body, good mothers. One of the newest breeds of Danish origin. They are noted for having the highest number of piglets per litter, average live weight of matured male is 310 – 400 kg and female is 250 – 330 kg. Good for bacon production. High prolificacy, average litter size of 11 with a good weaning rate (upper picture).

**Hampshire**: black, white belt, muscular. Average live weight of matured male 300 kg and female is 250 kg. Good for bacon production. High prolificacy, with a litter size of 9 with high weaning rate (middle picture).

**Duroc**: red, muscular, partially drooping ears, desirable as sires. They grow the fastest out of all the other breeds. Average live weight of matured male 300 kg and female is 250 kg. High prolificacy, with a litter size of 9 with high weaning rate (lower picture)

To get more information about the breeds:  
<http://www.ansi.okstate.edu/breeds/swine/>

# 4. Systems of Breeding

---

1. Intensive
2. Semi-Intensive
3. Extensive

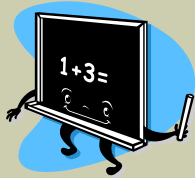
Pigs are neat animals, but must be cared for or provided a comfortable environment. An intensive system is best for them.

# 4a. Systems of Breeding

---

- Medium- to low-input systems dominate ruminant livestock production in developing countries. In arid and semi-arid areas these are pastoral or livestock-crop (agropastoral) systems. Crop-livestock (mixed) systems dominate in the wetter and sub-humid areas (including the sub-tropical highlands). Associated with these and with landless and marginalized households are non-ruminant livestock - mainly backyard or scavenging pigs and poultry.
- Long-term strategies for improvement schemes in these production systems should focus on the use of indigenous populations, in purebred or in crossbreeding systems with improved breeds. Genetic material and selection programmes should be carefully chosen according the characteristics of local systems and resource availability and on the basis of well-designed genotype evaluation trials.

# 4b. Systems of Breeding - Definitions



Define the terms below!

- Boar
- Barrow (or Hog)
- Farrowing
- Gilt
- Piglet
- Sow

## 4c. Systems of Breeding – Definitions

---

- Boar: mature male pig that can be used for breeding
- Barrow (or Hog): male pig castrated before weaning
- Farrowing: act of giving birth in pigs
- Gilt: Female pig about 6 months of age. Could be pregnant but has never farrowed yet.
- Piglet: from day old to about 2 months
- Sow: mature female pig that has farrowed at least once

# 5. Pig Housing

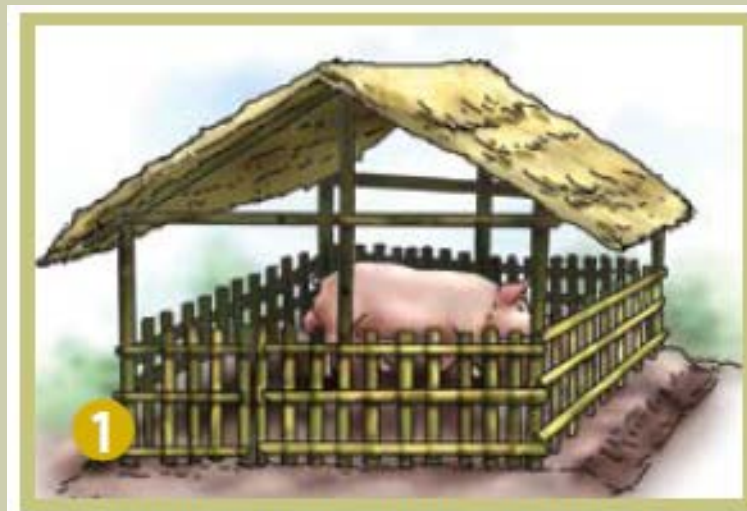
---

- A pig sty can be constructed cheaply using locally available materials. It needs to be constructed in accordance with climatic conditions and the pig production system.
- The pigsty should be comfortable for the pigs: good ventilation and ample shade, no overheating, no smells, no draft and no dampness. The building should be constructed in a direction that is protected from sun and rain. The pig building needs to be divided into different pens for each phase of the production cycle. The number and the size of the pens depend on the expected numbers of pigs to be housed in each production phase.

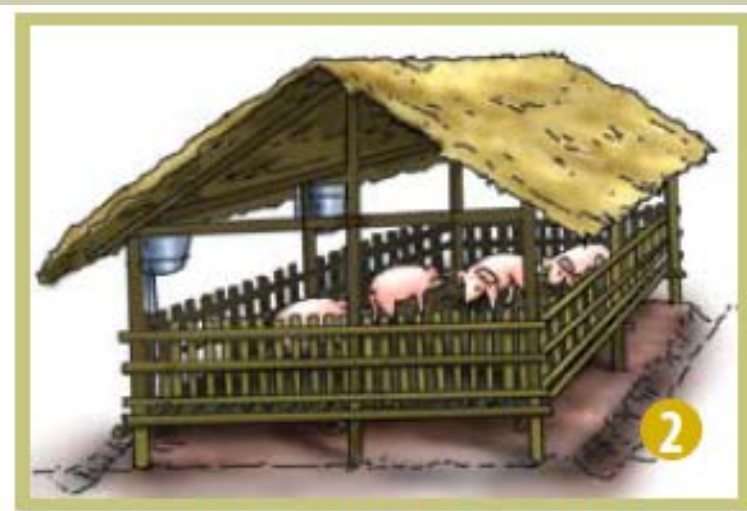
# 5a. Pig Housing

Spacing needs in a tropical system

- Boar: 9 m<sup>2</sup>
- Dry sow: 3 to 4 m<sup>2</sup>
- Farrowing sow: 6.2 m<sup>2</sup>
- Lactating sow: 10m<sup>2</sup> plus creep feeding.



*Separate house for breeding boar/pregnant sow*



*Separate house for gilt and dry sows*



# 5a. Pig Housing

Building investments are usually costly. They must be adapted to the specific breeding requirements.

- Protection from the sun
- Allow good ventilation and maintenance of good hygienic conditions (easy cleaning...)
- Separate animals of different ages
- Allow feeding without waste



# 6. Management Systems

---

In commercial farms (intensive system) the sows should produce offspring (piglets) and be destocked (culled) between 3-5 years

Only breeds with good genetic characteristics, conformation and feed converters should be used

The complex hormonal interplay between brain, pituitary gland, ovaries and uterus greatly impacts the reproduction performance of pigs

# 6a. Management Systems

---

Normally, there are 2 farrowings per year or 5 farrowings in 2 years.

Farrowed piglets should be provided with light to warm them, bedding material to insulate them from the cold floor and should be assisted to suckle first milk to strengthen the immune defense.

Piglets should be given iron syrup orally and tails docked at 4 to 10 days. Undesirable males should be castrated, fattened and destocked at 6 to 7 months.

Depending on breeding programmes, the health of the animal and correct feeding, you should get a minimum 8 to 14 piglets/sow.

Deworm quarterly, carry out second service (crossing), spray with acaricide for ectoparasites and environment for flies twice a week. Two weeks before farrowing, sows should be given an iron injection.

All unwanted males, runts, superannuated and disabled pigs should be destocked.

# 7. Reproduction

---

- When pigs reach breeding age, cross. About 3-10 days after farrowing and weaning, check if the sow is in heat and cross again.
- Pregnancy lasts 3 months 3 weeks and 3 days (114 days).
- Farrowing varies from 2 hours to 24 hours. Sows have 12 to 14 teats.

The calculation is as follows:

3-10 days barren (dry sow)

113-115 days gestation

35 days lactation

158 days total

# 7a. Reproduction – Precautions

---

Avoid in-breeding i.e.

- full sibling mating (i.e. brother mating sister or vice versa),
- half sibling mating, (i.e. half brother mating half sister or vice versa)
- backcross, (i.e. son mating mother or father mating daughter).

# 8. Diet Formulation

Good feed is necessary for growth, body maintenance and the production of meat and milk. You can use locally available feeds that are less expensive, but can be nutritionally complete when properly prepared. In fact, pigs can be fed well, using only kitchen scraps from a family's household. The nutritional needs of pigs can be divided into six categories or classes. These are water, carbohydrates, fats, proteins, vitamins and minerals.

Table: example of a ration for a local pig (in kg)

Ingredients	Pig weight 15 - 30 kg	Pig weight 30 - 60 kg	Pig weight over 60 kg
Soya beans	25	20	15
Rice bran	25	30	35
Maize	20	25	30
Broken rice	5	5	5
Wheat bran	20	15	10
Leucaena tree leaves	5	5	5
Total (100 Kg)	100	100	100
Crude protein (%)	16	15	14



# 8a. Diet Formulation

---

The diet varies in function depending on the pig's physiological state (gestation, nursing, fattening pigs, boars and gilt)

They need: energy, proteins, minerals (Ca, P...), other nutrients, such as fiber

Pigs kept in tropical region may eat lots of fiber, but it should be noted that pigs are single stomached animals, unlike ruminants which have complex stomachs and lots of microbial population to help digest fiber

The ability of the pigs to digest and utilize fiber is restricted to the microbial population in caecum which is relatively small in volume, hence pigs need special diets to perform; the digestive system of pigs is the same as humans

# 8b. Diet Formulation

---

The feed should contain the 6 classes of food :

- Energy sources 65 to 75%
- Protein sources 20 to 25%
- Calcium/ Phosphorus source 2 to 3%
- Mineral/vitamin additive and salt 1.5 to 2%
- Feed additives



## 8c. Diet Formulation – Feed Additives

**Feed additives** are substances, which are not feed but included in the formula to improve performance, improve feed efficiency and utilization e.g. enzyme, herbs & spices, antibiotics, de-wormer, sulphonamide etc.

Table: feeding rates by age and expected body weight gain (**ALO must use this to cross check feasibility of applicants' business plan**)

Age (wks)	Body Weight (kg)	Feed kg /day	Feed type
8-10	12-15	0.66	Sow and weaner/starter
10-12	15-20	1.0	Sow and weaner/grower
12-16	20-40	2.0	Sow and weaner/grower
16-18	40-50	2.5	Finisher
18-24	50-84	3.0	Finisher
24-28	84-105	3.5	Finisher



# 9. Pests and Diseases

---

## Pests

- Ticks, fleas, flies and ants

## Diseases

- Helminthiasis, foot and mouth diseases, African swine fever, anthrax, rabies, coccidiosis, brucellosis and colibacillosis
- To prevent diseases in the herds, practice good sanitation and give the pigs a balanced ration

# 9a. Pests and Diseases

---

Sick pigs generally have the following signs:

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



## 9b. Pests and Diseases – African Swine Fever

---

African Swine fever killed almost all the pigs around Bamenda in 2012.

- Highly contagious viral disease of swine
- Affects domestic and wild pigs
- High morbidity (approaches 100%) and mortality
- Quarantine and depopulation
- Import and export bans
- No treatment or vaccine
- Animal transmission: direct contact (usually oronasal) and indirect contact (uncooked garbage, fomites, bite of infected ticks, biting flies)

# 9c. Pests and Diseases – African Swine Fever

---

Incubation period: <5 to 19 days

Clinical signs:

- High fever
- Moderate anorexia
- Erythema, cyanosis
- Recumbency
- Bloody diarrhea
- Abortion
- Death



# 9d. Pests and Diseases – African Swine Fever

---

## Diagnosis

- Fever
- Characteristic post mortem signs in spleen, lymph nodes

## Treatment

- No treatment should be attempted
- Actions needed will be directed by state and/or federal animal health authorities
- Slaughter
  - Confirmed cases
  - In-contact animals
  - Possibly complete herd slaughter
- Area restrictions on pig movements



# 9e. Pests and Diseases – African Swine Fever

---

## Vaccination

- No effective vaccine
- We all need to do our part
- Keep our pigs healthy and free of foreign animal diseases



# 10. Liquid Manure

---

- Liquid manure can be good for crops, if used in adequate quantities
- To manage liquid manure, it is important to know its fertilizer composition (depends on the storage condition)
- Manure from infected pigs contains large quantities of viruses, bacteria and/or parasites. Contamination from pig manure poses a risk to the health of animals or humans if the manure is not adequately treated or controlled. The spread of pig slurry on agricultural land may introduce pathogens into the human food chain and ecosystem if due care is not taken during storage and spreading.





# 11. Poor Performance Factors

---

Several factors can cause poor performance in a pig farm:

- Lack of technical breeding know-how
- Poor feed
- Poor sanitation and lack of proper medication
- Ineffective labor force
- Diseases and pests
- Poor manure management on the farm

# 12. Cost of Production (XFA)

Livestock	Input per farm	Input per animal
Animal purchases	100,000	20,000
Feed (purchased feed)	85,750	17,150
Machinery (maintenance, depreciation)	10,000	2,000
Fuel, energy, lubricants, water	12,000	2,400
Buildings (maintenance, depreciation)	9,000	1,800
Vet & medicine	2,100	420
Labour	90,000	18,000
<b>Total</b>	<b>308,850</b>	<b>61,770</b>
	<b>Production</b>	<b>Unit price</b>
Pigs	5	70,000



# 13. Assessment

---

What criteria should loan officers use to assess pig farmers?

- Record keeping (there should be adequate records on the breeding plan, feed consumption and other services)
- Hygiene
- Feed and fresh water available
- Mating system
- Building
- Production cycle (batches, systems, number of rooms...)
- Protection against external diseases
- Performance
- Commercialization
- Cash flow needs
- Manure storage

**For more resources please visit AgriFin's website**

**[www.AgriFin.org](http://www.AgriFin.org)**

---

We welcome your feedback to help us further refine these training materials. Please contact us at [agrifin@worldbank.org](mailto:agrifin@worldbank.org).