BASIC PRINCIPLES OF ANIMAL PRODUCTION
TYPES, DISTRIBUTION AND SIGNIFICANCE OF FARM ANIMALS

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FACTORS OF CLIMATE AND THEIR EFFECT ON LIVESTOCK PRODUCTION

Animals have optimal range of climatic factors for their maximum production. Major climatic factors affecting livestock are ambient temperature, rainfall and humidity? Radiation, wind, length of daylight, e.t.c.

They have effects on livestock in 2 ways.

**1. DIRECT EFFECT**

This majorly has to do with temperature of environment versus body temperature in relation to thermal regulation. All of livestock are homoeothermic i.e. keep their body temperature constant with little variation. Each species have their own temperature range. Animals maintain their temperature by keeping a balance between heat produced or gained from environment, i.e. heat produced and heat loss through processes like evaporation, conduction etc. Evaporation occurs through sweating; in poultry it occurs through panting and through the network of air sac in their lungs.

**HOT CLIMATE**

Animal’s response to heat include:

i) Decrease in feed intake to reduce heat produced (as a result of eating? digesting and utilizing feed). Food consumption and rumination may practically cease in cattle as ambient temperature rises above 40°C. Efficiency of feed utilization also decreases at increasing ambient temperature.

ii) Reduction in duration of grazing,

iii) Increased water intake and subsequent increase in urinary output,

iv) High temperature affect production in terms of growth, milk production, egg production. There will be decreased production,

v) Reproduction is affected. In females, age at puberty, regularity and duration of oestrous cycle, incidence of abnormalities of ova, embryonic mortality, foetal death rate, gestation length and foetal size are affected while in males age at puberty, sexual libido, thermoregulatory function of the scrotum affecting spermatogenesis and semen characteristics are affected,

vi) Decreased thyroid activity with a subsequent reduced metabolic rate,

vii) Sweating occurs. But animals like rabbits cool by, transudation and applying salivary moisture to the hair by licking themselves. Pigs wallow to keep cool

viii) Panting and excessive salivation (Slobbering) to evaporate water from upper respiratory and oral cavities.
ix) Growth will be affected as climatic stress, depress appetite, reduces feed intake and grazing time.
x) Vasodilatation
xi) Increased body temperature
xii) Coma and finally death can result.

**Cold Climate:**
i) Newborn animals are more susceptible to cold.
ii) Energy requirement and disease susceptibility increase when animals are kept in wet pen.
iii) Animals hump up, shrink the skin to reduce body surface area thereby reducing rate of respiration.
iv) Vasoconstriction occurs.
v) There is erection of hair and this increases insulation value.
vi) There is increased heat production by shivering.
vii) Animals eat more food and drink less water.
viii) Animals grow more hair and deposit layer of fat under the skin.

2. **INDIRECT EFFECT**
The major indirect effect is on the quantity and quality of feed available. The most important climatic factors that limit plant growth and, hence quantity of feed available are ambient temperature, rainfall, length of daylight, and intensity of solar radiation. Excess rain can affect feed supply, drought reduces forage supply and feeding ingredients. There is also the problem of parasite and disease during the raining season. Pathogens are very active during this season.

**DISTRIBUTION OF LIVESTOCK IN NIGERIA**
Sheep, goat, cattle, rabbits, pigs and are common in Nigeria. Their distribution varies from one area to the other. Generally the Northern part has more of these animals than the Southern part. A major factor for this is climate. The Northern part supports the growth of grasses which are necessary for most herbivorous animals thus most ruminant animals are found in the North.

Diseases like trypanosomiasis due to tsetse infestation are common in the North and this tends to limit the number of animals found in the South.
Environmental condition in the South favours high humidity and temperature thus necessitating construction of farm structure which will aid the reduction of heat and humidity.

Taboo is another factor and is usually associated with religious belief. The resultant effect of this is that some animals will be found in some areas and not found in another. In Nigeria, the population of pigs is low in the North and fairly high in some parts of the South. This is because of Islamic religion since Muslims are predominant in the North than in the South. Their belief is that pigs are unholy animals and Islamically forbidden to be eaten. It is a taboo for a Muslim to eat pork. Swine production in these areas is therefore low since their demand is low. The socio-economic status of an individual is measured in some areas by the material things he possesses. The Fulanis attach serious importance to the heads of cattle in their herd. It has been observed that an average Fulani rarely sells his animals. His keeping them in the range is associated with a social status. In the Southern Nigeria especially in villages, families are also ranked in terms of number of goats, sheep, cattle, etc. that are kept. A man with a very large size of herd over is considered wealthy. The observable effect of this is that animals are concentrated in areas where breeding exceeds consumption among other reasons.

ROLE OF LIVESTOCK IN NATIONAL ECONOMY
The importance of livestock are as follows:

1. **Source of Food:**
   Meat obtained from livestock supply high quality protein in Nigerian diet. Milk is also obtained and this is regarded as a complete food in that it contains protein, carbohydrate, fat, minerals and vitamins. The type and quality of each depends on breed and environment in which the livestock are kept, eggs are also obtained. This is also a complete food as milk. Animal products for feeding of livestock are also obtained. These include bone meal, blood meat e.t.c.

2. **Source of Clothing and Raw Materials for Industries:**
Hides and Skin are used in making leather materials for shoes and all kinds of belt. wool, hair and pelt are made into blankets and other clothing material of superior quality and for protection from the elements and aesthetic adornment.
3. **Source of Power and Transportation:**

Some animals can provide man with power to carry his burden, pull his carts and tillage equipment, to thresh his grain, operate his irrigation pumps and provide transportation. It is estimated that over three-quarter of all agricultural power in the world comes from animals. Ass, horse, donkeys camels and mule are used to carry loads over long distances. Bull, Buffalo and horse are used to operate thread mills and drag large farm implements.

4. **Source of Fuel and Fertilizer:**

Dung can be used for fuel, fertilizer or as a feed source for worm production. Manure can be used as fuel where there is scarcity of firewood and where fossil fuel is expensive. Dung can be either burned directly or put into a fermentation vat to produce methane gas that can be burned for heat. Droppings from animals applied as fertilizer improves the tilth and permeability of the soil and supplies nitrogen, phosphate and potash as well. However, the fertilizing value will depend on what the animals ate. Dung can serves as feed for compost worms such as Lumbricusrubellus producing up to 200 times initial weight in a year and these are excellent sources of protein for poultry, pigs and or fish or in some cases they are eaten by man. Worms reduce the ammonia and other odours, the flies and the faecal mass.

5. **Source of Income/Economic Resource:**

The industry gives a greater and quicker return on investment. Animals are valuable trading tools that can usually be readily sold to meet cash needs or emergencies. Animals may improve the economic status of the family or contribute to better standard of living of the farmers by providing such products as live animals, eggs, milk, meat or pelts for sale. The trade in livestock production raises the economy of the country through foreign exchange earner. The trade is also an insurance against crop failure.
6. Animals Provide Medicine:-
Medicinal and other products can be derived from animals, e.g Insulin can be extracted from the pancreas of steers to keep the diabetics alive.

7. Animals Provide Companionship:-
Small animals keep young children occupied. The human soul finds contentment in associating with animals. This can be a disadvantage however, since once an animal becomes a pet there is some reluctance to eat it.

8. Source of Employment Opportunities:-
In Nigeria, the Fulanis are fully engaged in cattle, sheep and goat rearing. This is a traditional job passed down through generation. In recent times, because of the need for more animal protein production, many individuals have set up their own farms. The owners in turn employ farm managers, attendants, store keepers etc. to help them run the farm effectively thus those employed earn their living. This contributes to economic growth. Livestock rearing also enhances better distribution of labour i.e when less is to be done on animals you can concentrate on crops production and vice versa.

9. Animals used for Social Statues:
Farm animals are used for sociological functions like payment of bride price, religions rites etc. Killing of goats, cows etc, is a status symbol in the society. Animal are also used as gifts.

10. Animals serve as Storage:-
Animals may serve as a storage reservoir of energy, protein and other nutrients that are produced in grain, forage and other crops. The plant grown in excess of current needs is eaten by the animal and converted into animal tissue (growth and fat) that can later be consumed by man. Certain by-products of crop production that cannot be consumed by man because of the poor quality and toxicity e.g yam peel, cassava peel, rice bran etc, are fed to animals from which high quality protein can be derived. Animals add value to crop residues by converting these residues to preferred animal products.
COMMON ANIMAL RURAL TERMINOLOGIES

RUMINANT HERBIVORE: Animals with four compartmental stomachs. They feed mainly on pasture, e.g. cattle, sheep and goat.

NON-RUMINANT HERBIVORE: They are animals that feed on grasses and herbage, but they lack compartmental stomach, e.g. donkey, rabbits.

MONOGASTRIC: NON-HERBIVORE: Animals with simple stomach.

CATTLE TERMINOLOGY

Dairy: A dairy is a building where milk and milk products are handled.

Barn: A building where grain is stored or cattle are reared.

Pen: A small enclosure for cattle, pigs, goats, sheep etc.

Paddock: A small field where cattle, horses etc are fenced in.

Crush: Fenced passage with funnel shaped end along which cattle are driven in single file for branding, spraying etc.

Stanchion: An upright bar or a pair of bars for confining cattle in a stall.

Stall: A compartment for individual animals in a cow house or stable.

Bull: A sexually matured male animal kept for breeding purposes.

Steer: A bull castrated while young and reared for beef.

Stag: A bull castrated when almost mature.

Bullock: Castrated bull used for work.

Calf: A young animal up to 12 months old.

Calving: The act of parturition in cattle.

Yearling: An animal between 12 and 24 months old. At 24 months it becomes a two yearling.

Heifer: A young female animal that has not yet had her first calf. She becomes a cow soon after the first calf is weaned.

Freemartin: When a female calf is born twin to a male calf and sometimes such female is infertile/sterile when it reaches maturity (A heifer which is sterile because she was twin to bull calf)

Cow: A mature female cattle (bovine).

Beef: Flesh of adult cattle.

Veal: Flesh of young cattle.
Nymphomaniac Buller: An animal that is on heat more frequently than normal and persistently so. It is often due to presence of follicular cysts in the ovaries.

**Estrus/Oestrus or Heat Period:** The period when the female receives the male. It is often characterized by swelling of the vulva, restlessness, mounting and being mounted etc.

**Service:** Act of mating.

**SHEEP TERMINOLOGY**

**Ram:** Fully mature male sheep.

**Stud or Tup ram:** Male sheep kept for breeding purposes.

**Ewe:** Fully matured female sheep already lambing, or producing.

**Ram lamb:** A young male sheep under one year.

**Ewe lamb:** A young female sheep under one year

**Lamb:** A young sheep of either sex.

**Wether/wedder:** Castrated male sheep.

**Gimmer:** Sheep ready for service.

**Lambing:** Act of parturition or giving birth in sheep

**Flock:** Group of sheep

**Fleece:** Hair of sheep

**Mutton:** Meat of sheep

**Shearing:** Cutting the hair of sheep for commercial use.

**Docking:** Shortening or cutting of sheep tail to prevent blow flystrike.

**Tupping:** Act of mating in sheep

**GOAT TERMINOLOGY**

**Kid:** A young goat of either sex under a-year.

**Buck-Kid:** A young male goat under 1 year

**Doe-Kid:** A young female goat under 1 year

**Buck/Billy goat/He goat:** Fully matured male goat above 2 years of age.

**Doe/Nannygoat/She-goat:** Fully matured female goat above 2 years of age.

**Castrate:** Male goat whose testicles has been removed.

**Kidding:** Act of giving birth in goat.
Service: Act of mating.
Chevron: Fresh meat of goat.

PIG TERMINOLOGY

Boar: A mature male pig of any age
Stud boar/stock: A mature male pig of any age used for service.
Gilt: A young female pig which has not farrowed.
Litter: A group of piglets from the same mother. No of piglet born per birth by the same sow.
Brown: A young male pig which has not been used for mating.
Barrow/Hog: This is a castrated male pig.
Herd: A collection or group of pigs.
On-heat: The art of showing the desire for mating.
Farrowing: The art of giving birth in pig.
In-pig sow: A female pig that is pregnant.
In-pig Gilt: A young female pig that is pregnant for the first time.
Dry Sow: A female pig whose young ones have just been weaned.
Piglets: Are the young (baby) pigs having up to 10kg bodyweight.
Weaner: Are pigs between 10-20kg body weight.
Grower: Pigs having up to 45 kg body weight.
Fatteners: Those pigs that are fed purposely to gain weight. They have up to 90 kg body weight.
Service: Act of mating between male and female pigs
Pork: Fresh meat of pig.
Lard: Fat content of the meat of pig.
Runt: Smallest piglet in a litter, usually the last to be farrowed.

RABBIT TERMINOLOGY

Buck: A mature male rabbit.
Doc: A mature female rabbit.
Fryers: Young rabbit of about 2 months of either sex.
Dry doe: A female rabbit which has just weaned fryer.
Kindling: Art of giving birth in rabbit.
Litter size: Number of young produced in one gestation.

Kittens: Young of rabbits.

Foster (mother) dam: A doe which act as dam in place of real dam.

Weaning: Act of separating the young one front the dam.

Culling: Act of removing the sick and unproductive animal from the herd or flock.

MILK AND MILK PRODUCTS

Whole milk: Fresh milk unchanged in form except by pasteurizing; Milk drawn from the cattle.

Milk cream: Concentrated fat portion of milk made by subjecting milk to centrifugation in a cream operator. It contains about 40% fat.

Skim milk: The remnant when cream is separated from wholemilk. It contains about 0.05% fat.

Butter: A milk product made from cream. It contains about 80% fat, the remnant being water, salt and traces of other substances.

Colostrum: Milk produced for the first 3-4 days after parturition. Its composition changes gradually from 27% solids on the first day to a normal milk composition about six days later. It is often referred to as abnormal milk.

Cheese: Made by coagulating some of the proteins in wholemilk or skim milk by bacterial fermentation or treatment with enzymes. There are many different types of cheese eg Cheddar, Maribo, Danbocheeses.

Whey: A by-product of cheese. It contains water, sugar, some proteins and minerals. Very useful in feeding young cattle.

FEEDING TERMS

Ration: Quantity of feed offered an animal in a 24 hour period.

Ad libitum: Providing unrestricted quantity of feed. Feeding to appetite, opposite of restricted feeding.

Zero grazing/soiling: The practice of feeding where the forage is cut for the animal to feed on where it is confined.

Steaming-up: The practice of feeding extra grain or concentrate to pregnant animals a few weeks before parturition.
**Flushing:** The practice of feeding extra concentrate thereby raising the level of nutrition to animals before mating period to increase ovulation rate during the time of service.

**Concentrate/grain:** A mixture of feeds high in energy, low in fiber and highly digestible.

**Roughage:** A feed usually forages, low in protein and energy and high in fibre.

**MEASUREMENT OF HERD FERTILITY**

**CALVING RATE:** Number of calves born alive and healthy as proportion of all breeding cows in the herd.

**Weaning Rate:** Number of calves weaned as proportion of all breeding cows in the herd.

**Calving Interval:** Number of months between successive calves of a cow.

**Pregnant Rate:** Number of cows pregnant as proportion of all cows examined at any one time.

**Conception Rate:** Number of cows that conceive annually, as a proportion of all cows mated or inseminated.

**Number Of Services Per Conception:** Number of times cow is served or inseminated before conception takes place.

**Gestation:** The period of pregnancy, between conception and parturition

The gestation period

<table>
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<tr>
<th>Animal</th>
<th>Gestation Period</th>
</tr>
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<tbody>
<tr>
<td>Cattle</td>
<td>280 days (9 months)</td>
</tr>
<tr>
<td>Sheep</td>
<td>140-160 days</td>
</tr>
<tr>
<td>Goat</td>
<td>145-153 days</td>
</tr>
<tr>
<td>Pig</td>
<td>112-114 days</td>
</tr>
<tr>
<td>Rabbits</td>
<td>31 days</td>
</tr>
</tbody>
</table>

**Estrus cycle:** The cycle of events occurring between successive estrus. A period and another estrus period

<table>
<thead>
<tr>
<th>Animal</th>
<th>Estrus Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>17-23 days</td>
</tr>
<tr>
<td>Sheep</td>
<td>14-19 days</td>
</tr>
<tr>
<td>Goat</td>
<td>18-21 days</td>
</tr>
<tr>
<td>Pig</td>
<td>21 days</td>
</tr>
</tbody>
</table>
**Heat period:** The period when a female animal may be served by a male animal and possible conceive.

**Breed:** A group of animals possessing certain characteristics that are common to the individuals within the group e.g size, colour. This distinguishes them from other groups of animals within the same species. These characteristics are the trade mark of that breed and are transmitted from one generation to another.

**CATTLE**

Three major types of cattle were imported into Nigeria with the nomads into North East part of Africa. These are ancestors of most of the cattle in Africa today. The cattle were:-

(a) Hamitic Longhorn (HLH)
(b) Celtic Shorthorn (CSH)
(c) The Zebu.

Hamitic Longhorn and Celtic Shorthorn are considered to be ancestors of Bostaurus (humpless cattle) while the Zebu of the Bos indicus (humped cattle). These cattle mix at various times and ways to produce the Sanga cattle.

Hamitic Longhorn (HLH) entered Egypt at about 5000 BC and they were followed at about 2700 - 2500 BC by Celtic Shorthorn (CSH). As the CSH people came, there arose a competition and there was voluntary Southward migration of the owner of HLH until they reached Morocco and then further subdivide into 2 groups. The N’Dama is a descendant of the Hamitic Longhorn.

In their migration, the Longhorns took 3 routes:

1. Westward along the Mediterranean. This reached Morocco.
2. Southwest ward via Tibesti highland areas.
3. Southwards up the Mile to West Africa.

Another group of HLH is Kuri or Buduma that has sound characteristics. Incidentally N’dama seems to be the chief breed of beef cattle in West Africa. The N’dama has survived due to their resistance and tolerance to resistance and tolerance to trypanosomiasis and they are common in West African coast while Kuri and Buduma are isolated around Lake Chad. They are great swimmers. N’dama are predominant locally in Shepeteri, Shaki, Oyo.

From the Celtic Shorthorn arose the Muturu, also referred to as West African Dwarf Shorthorn. They are also resistant to trypanosomiasis but they are less tolerant than N’dama. The latest
arrival and third type of cattle is the chest humped Zebu. They were imported in small numbers into Egypt by the Arab invaders as early as 2500-2000 BC. Today they are represented by the White Fulani which incidentally is the widely distributed breed of cattle in the Nigeria. Zebu cattle hold their existence to their being resistant to rinderpest than the humpless or Sanga cattle, Sanga describes a certain type of cattle or a mixture of Zebu and Hamitic and/or Shorthorn.

Types of Cattle

1. **Beef Type**: Produced for meat. Characterized by their great width, depth of body (height in relation to growth) and relatively short legs. Convert feed efficiently into high quality meat for human consumption. e.g. Muturu, Keteku, N'dama, Hereford, Brahman.

2. **Dairy type**: They are specifically adopted to convert feed efficiency into maximum high quality milk. They are characterized by a lean angular form and a well-developed mammary system. e.g. White Fulani, Kuri, SokotoGudali, Friesian, Holstein, Brown Swiss, Guernsey, Jersey.

3. **Dual Purpose type**: Intermediate between beef and milk type (by combining the characteristics of the two) both in conformation and in production of milk and meat, e.g. White Fulani, Kuri, etc

4. **Draft type**: Combine characteristics required for good work like free moving limbs, sound feet, great size and ruggedness with a quiet temperament and submission to discipline. Can do different types of work like ploughing etc e.g SokotoGudali, German Brown.

**SOME BREEDS OF CATTLE**

1. **N’DAMA**

These are the most widely distributed breed in West Africa. It is the hump less breed of HLH type and the ancestors of this breed were probably the first domesticated cattle in Africa. It is preferred in the tse-tse fly invested areas of South Nigeria because of its resistance to trypanosomiasis and relatively large size. It has a compact well-proportioned body with a good beef conformation set on short legs. They are poor milkers; they are good meat animals weighing about 18kg at birth, 134 kg at one year old, 300 kg as mature cow and 320 - 365 kg as mature bull. They are also used for draught purposes. They are golden yellow to brownish in colour and
sometimes with white markings on the face, belly and legs. They have a reputation for longevity. Cow has a breeding span of 14-15 years. Age at first calving is 3 years

2. MUTURU

This is the humpless shorthorn animals found in forest zone of West Africa. The breed is reared for its meat and it is resistant to trypanosomiasis. It is a small thick set animal weighing about 230 kg at maturity, very are rugged. Red to brown in colour with broad head and short lumps. They are poor milkers used for working purposes, but the stamina is limited. The animal possess broad poll, short horns and have little dewlap.

3. WHITE FULANI

Also known as Bunaji or White Bororo. They are owned exclusively by nomadic Fulani in the central pastoral belt of Nigeria. They are a range type of cattle, most numerous and widely distributed in Nigeria find colour is white but can range from brown to black. The dewlap is large commencing at the trout and is carried well between the front legs. The hump is well developed. The average calving age is 3 years 7 months and a life span of 9-10 years. It is a triple purpose breed. Use primarily for milk production; good beef animals possessing light skeleton and good but slow workers. They have a well-developed and strongly attached udder. Although milk yield is low but when raised under good management with good feeding conditions it is capable of producing much more yield.

4. SOKOTO GUDALI

This cattle is typical of the short-horned zebu found in West Africa. This breed is somewhat bigger and heavier than White Fulani. They are medium size deep bodied, short horned, humped cattle found in Sokoto area of North Western Nigeria. The hair is short and skin is medium thick loose and pigmented. Their colour varies from white to grayish white to cream white. Has well pronounced dewlap. Hump is well developed in both sexes. This breed is less resistant to trypanosomiasis and its milk production is also, lower than that of the White Fulani, Average age at calving is 3 years while active life span 10 years. It has potentials as dual purpose animal. As dairy, they are fair milkers while as draught they are slow, docile, sturdy and reliable.

5. FRIESIAN

It is also known as Holstein-Friesian. It is a dairy breed of the temperate zone. The colour is black with white marking. The mature cow weighs 880 kg, mature bull 998 kg while weight at
birth is about 45 kg. The calves are strong and vigorous and the males are ranked high as beef producers amongst the dairy breed, being particularly well suited to intensive fattening system. Average milk yield is about 4800 litres per lactation.

6. JERSEY

It is also a dairy breed of the temperate zone, in a variety of shades of yellow. They have a grey ring of hair behind a black muzzle, Matured cow and bull weigh 464 Kg and 880 kg respectively. In tropical areas, Jersey cattle is crossed with the Zebu breeds. It has an average yearly production of 3400 litres of milk with about 5% fat content is used for butter.

SHEEP (Ovisaries)

Domestic sheep belong to the family Bovidae (Hollow horns) and four different major types of sheep were introduced into Africa since domestication in Asia:-

1. The primitive Moufflon
2. The screw-horned hairy sheep
3. Woolled sheep of the Ammon type
4. Fat - rumped hairy type

The first three wild species contributed to the genetic makeup of modern breeds of sheep. Sheep are valued for their meat and wool and as such can be classified into meat type and wool type.

WOOL TYPE; May be classified into 3 main groups

1. Long wool breed
   Has a fleece of long white wool. Mature and fatten easily. e.g Leichester

2. Short wool breed
   These produce short wool. Has a wide head with wool all over the fore-head

3. Mountain breed
   This breed is mainly adapted to mountainous regions. Has coarse hairy wool which are only useful for tough coating and carpet manufacturing e.g. Scorch black, Cheviot.

MEAT TYPE:

This type is useful for meat and also for its skin, milk and hair purposes. They are mainly found in the Tropics. They can be hairy or woolled. The hairy can be thin tailed. The small type (e.g West African Dwarf) and. the larger type (e.g, Yankasa., Ouda). The hairy can also be fat tailed e.g. Sudanese desert type.
**BREEDS**

**OUDA**
This is the Fulani type or the Tuareg type found in Niger. They are also found throughout the Sahel-Sudan vegetation zone in Nigeria. But it is more predominantly found in the North-Western part of the country. They are large, thin and long tailed animals with moderately long flappy ears. Males are horned which are quite large emerging sideways and slightly backwards with a twist. Mature males sure up to 84 cm at the shoulders. It has 2 colours; amber and reaches up to the abdominal region and the posterior is white. They are susceptible to helminthes and trypanosonnasis. They are used widely for their meat throughout Nigeria and their skin a valuable export commodity. Mature liveweights are 30 - 45kg in females and 30 - 80kg in males. It is adapted to extensive grazing and survives under hot and dry environment.

**YANKASA**
This is a fairly big animal with a matured weight of 30-45 kg and 25-40kg for rams and ewes respectively. The rams have a well-developed horn while the female is polled. The animals are usually white though black patches occur at times. They have short ears and are brought from the Northern region of Nigeria to the South for slaughter especially during festive periods. It is the most widely distributed and most numerous breed of sheep in Nigeria.

**WEST AFRICAN DWARF**
This breed is found all over West Africa especially the Forest and derived Guinea savanna. It has fine hair usually white in colour or a mixture of black and white. They are small, short, lagged, hardy and tolerant to trypanosomiasis. They are also known for their scavenging habit around compounds, villages, towns and they live unconfined almost entirely on grasses and bushes. Mature live weight is 15-25kg in ewes and 20-30kg in rams. The ewe is hornless while the males have horn.

**BALAMI**
It is found throughout the North Eastern part of the country but more concentrated in Borno State. It is a big, predominantly white with convex face breed of sheep. The ear is large and droopy. The tail is thin and long. Horns are prominent in rams but absent in the ewes. Mature weight is 40-65kg in males and 30-45kg in females. Balami has a good potential as a meat producer and it has ability to survive under adverse conditions.
GOAT (Capra hircus)
Goats belong to the Family Bovidae and genus Capra. Goats are widely distributed and very important in subsistence agriculture because of its ability to adapt and maintain itself in harsh environment. In Africa they are kept for meat. They also produce milk, skin and hair. The meat is preferred to both mutton and beef due to:
(a) Its higher lean content
(b) Some special features like its being more compact and colour slightly darker than mutton.
Goat milk is a useful product for subsistence peasant farmers and an important protein source.

Advantages Of Goat Milk Over Cow's Milk
1. Free from infection of tubercle bacilli.
2. Contains higher proportion of smaller fat globules which facilitates easy digestion.
3. Has high proportion of vitamins and minerals,
4. Has certain anti-allergic properties.
The hair is used for making carpet and is also useful in textile industry

Classification of goats: This is done using 4 methods namely:-
(a) Origin
(b) Body size
(c) Ear shape and length
(d) Function

On the basis of origin there are;
1. European type e.g. Saanem, Alpine
2. Oriental type e.g. Nubian, Angora, Damascus
3. Asiatic type e.g. Jamnapari, Kashmir
4. African type e.g. Red Sokoto (maradi) West African Dwarf
5. South American type e.g. Moxoto, Marota.

On the basis of function there are:-
1. Milk Type: Found mainly in the temperate zones e.g. Anglo-Nubian, Saanem, Damascus and Jamnapari,
2. **Wool Type:** Produce substantial quality of wool which are harvested at definite intervals for industrial production of sweater, blankets, carpets and dusters e.g. Angora – Mohair production

Meat Type: e.g. Jamnapari.

The skin of Sokoto Red is very good commercially. It is the best goat skin *in* the world.

**BREEDS**

1. **RED SOKOTO (MARADI):**
   This is the most important Northern breed and widely distributed breed of goat in Nigeria. It is one of the few well defined breeds of goats and is characterized by its uniform dark-red coat colour, short and horizontal ears and horns in both sexes. It has fairly long legs and fairly size. Mature liveweights are 20kg and 25kg for ewes and bucks respectively.

2. **WEST AFRICAN DWARF:**
   This is also known as West African Fouta Djallon. This breed is resistant to trypanosomiasis. It is about 40-50cm in height and weights about 25kg at maturity. The mean birth weight is 1.40kg, weighs 12.85 kg at one year of age. This appears to be getting smaller in size as it moves Southwards. It is usually black, brown or white in colour and hardy.

3. **SAHELIAN:**
   It is found in the semi-desert areas of Lake Chad in the North-Eastern part of the country. It is large in size with long legs. It is usually white or white with brown incolour.

4. **SAANEM:**
   This is an exotic breed. It is a big animal and white in colour. It is from Switzerland in Saanem valley. The nature weight of the doe is 54kg while that of buck is 84kg. The milk yield is 2250 kg per lactation year. This breed can be crossed with West African Dwarf goat.

5. **ANGORA**
   This breed is from Turkey (Angora Division), It is almost pure white and the outer coat is made up of long stands of hair known as Mohair.
6 NUBIAN
The breed exists in all colours - black, white, red, white and all combinations. The milk yield is averaged 1979kg per 305 day lactation.

POULTRY
Poultry is used as a general name for many birds that are used as food by man. There are four common species of domestic poultry:
(a) Fowls (chickens) *Gallus gallus*
(b) Ducks *Cairinamoschata*
(d) Turkey *Meleagris gallopavo*

BREEDS OF DOMESTIC FOWLS
It is practically impossible to compile a comprehensive list of the breed of domestic fowl because new ones are being developed daily. However, these breeds can be characterized to a great extent through their places of origin and utility.
These are the following classes:
1. MEDITERRANEAN CLASS: They have small bodies, white ear lobes, large and mostly single combs. They mature early and produce white shell eggs. They are of flighty or nervous disposition and they are non-broody. They are referred to as light breed. Mature cockerels and hen approximately 2.7 kg and 1.8 kg respectively. e.g Leghorn, Minorca, Ancona.
2. ASIATIC CLASS: They have large bodies and red earlobes. They produce tinted or brown shell eggs. They are broody and flabby (weak) in disposition e.g Brahma, Cochin.
3. AMERICAN CLASS; This breed is developed by American. They are characterized by yellow skin, red earlobes and brown shell eggs e.g. Rhodes Island. Red(RIR), Plymouth Rock, New Hamshire, Wyendotte.
4. BRITISH/ENGLISH CLASS; They have white skin and red earlobes, Almost all lay brown shell eggs and they are referred to as heavy breeds.
e.g. Cornish, Dorking, Sussex, Australorp, Orphington,
Heavy breeds that are prevalent under Tropical environment are Rhodes Island Red, New Hampshire, Plymouth Rock and Australorp. Among the light breed the most popular is the White Leghorn. It is noted to be heat tolerant. Other examples include Minorca and Anconia. They are all small, early maturing and they produce white shell eggs.
5 **INDIGENOUS BREEDS:** The indigenous breeds are hybrids of the light and heavy breeds that have been bred by the large scale International Poultry Breeding Corporations. The, indigenous fowls in Nigeria seem to have more of the characteristics of the light than the heavy breed. It is small in size, early maturing, have nervous disposition, and produce white shell eggs. But like the heavy breeds, it is notoriously broody.

**PIGS**
All the present domesticated breeds of pigs are derived from Sus. *vittatus* and Sus*scrofa*.
Generally pigs can be classified into 3 types namely:-

(a) Pork type  
(b)Bacon type  
(c) Lard type

**Pork type** combines muscling, length of body and ability to reach market weight without excess body fat. They can be marketed when a liveweight of .40 - 80 kg is reached or as heavy porkers at 80-80kg.  
**Bacon type;** have well developed hams and long bodies and eye muscle (longissimusdorsi). They have sufficient muscle for the production of desirable bacon.  
**Lard types** are grown to heavy weights of between 100 - 150kg and they are fed diets that promote fat deposition. At slaughter, the fat is removed and processed into lard.

**BREEDS**
**BRITISH BREEDS**

1. **Large White** (Yorkshire): It is a large, long, white coloured pig with long erect ears. The head is moderately long with slightly dished face and broad snout. The breed is highly prolific (producing many youngs) and have good mothering ability. It is therefore referred to as mother breed. Average litter size is about 12-15. It is used for the production of bacon in the temperate zones and pork Tropics. It has the advantages of expressing sunburns if unduly exposed and this call for extra care to provide housing facilities.  
2. **Berkshire:** It is a very large black pig with 6 white points on its feet, nose and tail. It has a long and curved snout. It also has a long thick but not deep body and short legs.
It is a good meat type with erect ears that takes about 8-6\% months to reach market weight of about 92kg. Its average litter size is about 9-11.

3. **Large Black:** This breed is used extensively in Africa. It is a solid black coloured pig, long with drooping ears. It is also a good meat type used extensively for crossing native pigs in the tropics.

**AMERICAN BREEDS**

1. **POLAND CHINA:** This is a large black lard type of pig with 6 white points like the Berkshire. But the Poland China has a long face, drooping ears and a white point on the nose. This breed was obtained from crosses from about 8 breeds of pigs. Has an average litter size of about 7-9.

2. **DUROC:** The name is derived from the shortened former name Duroc Jersey. A combination of 2 popular strains of Jersey Red which is a large animal noted for its rapid growth and largeness and Duroc, which is also large but more compact. The Duroc is red in colour and have drooping ears. They are sound and vigorous; grows fast with moderate feed, have large size and also prolific. They possess arched back.

3. **HAMPShIRE:** This is a black pig easily recognized by a white belt or collar around the shoulders and including the fore legs. The pigs are very active, very prolific, good nursing mothers and they have good feedlot performance. They yield lean and red meat. They are commonly used for breeding purposes and they are probably the best pork type of pig. Litter size is about 11-13.

4. **LANDRACE:** This breed is white in colour with long drooping ears. It has the longest body length of all the breeds. They are also prolific, of good mothering ability and fast-growing. They are good baconers containing high proportion of lean meat. It is known to be highly adaptive to the tropical environment.

**LOCAL/INDIGEBONUS BREEDS**

They are small in size with long snout; back swept ear and a straight tail. They are characterized by stunted growth, poor reproductive performance of average of 3 piglets. Liveweight at
maturity is about 60kg. They are very hardy and have sharp feet. The commonest colours are brown with black patches, brown, black with grey or white patches,

PERCENTAGE DISTRIBUTION OF PIG BREEDS IS NIGERIA
(COMMERCIAL FARMS)

<table>
<thead>
<tr>
<th>Breed</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large White</td>
<td>53.30%</td>
</tr>
<tr>
<td>Landrace</td>
<td>7.56%</td>
</tr>
<tr>
<td>Duroc</td>
<td>0.64%</td>
</tr>
<tr>
<td>Cross breed</td>
<td>22.34%</td>
</tr>
<tr>
<td>Indigenous</td>
<td>5.71%</td>
</tr>
<tr>
<td>Others</td>
<td>10.45%</td>
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</tbody>
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RABBITS
Rabbits belong to the genus Orytolaguscuniculus. The distribution of rabbits all over the world was done by the voyagers of England. Rabbits are noted for their meat, fur and used as pets. Fur is useful for making winter coats. Rabbits can be raised relatively easily.

BREEDS
1. CHINCHILLA:
This breed is dark grey to black in colour. It adapts well in Nigeria, weight at maturity is 4.1-5.4kg

2. NEWZEALAND WHITE: They are white in colour. Adult buck weighs from 4-5kg and does frost 4.5-5.5kg. The youngs, have a low food - to meat conversion ratio.

3. CALIFORNIA:
The animals of this breed have a white body with black markings on the nose, ears, feet and tail. Adult weighs from 3.6- 4.5 kg. Most are well fleshed on the back giving a good meat to bone ratio.