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20
(principles of animal production II)

Poultry → Domestic birds.

Poultry is any bird that is reared or hunted for a useful purpose. Poultry is not the practise but the bird itself e.g ostriches, guinea fowls, domestic fowl, turkey, duck, geese, pheasants e.t.c.

All of these lay eggs. They all have same pattern of reproduction. The eggs we buy in the market are called table egg or infertile eggs.

The poultry species belong to the taxonomy called AVES or avian class. Most of the poultry species are domesticated and are managed on the same basic principle of the domestic fowls.

We have 3 orders popular in the avian class.

classification & examples of the birds mostly used in the class aves.

Order	Family	Name	G. Name	Male	Female
1. Galli Farmer	Phasianidae	D. Fowl	Gallus gallus Gallus domestica	Cock Cockerel Rooster Cock	Hen or pullet Chick Chick
		Bush fowl	Francolinus sp		
		Pheasant	Phasianus		
	Odontophoridae	Quail			Young
	Numidae	G. Fowl			

In a natural habitat, some birds have breeding season. We have 2 breeding seasons in a year. A clutch of egg is the number of eggs a bird can lay in a breeding season. The jungle fowl can lay 10 - 13 eggs in a breeding season. The domestic fowl lay up to 280 eggs a year. This birds also have common products which includes; ① Eggs ② Meat ③ Manure ④ Droppings

~~or droppings~~

① The poultry dropping in manure have the potential of enriching in the soil because poultry in general do not produce urine seperates from faeces. The urine contains urea which is very important to the plant growth. The urine contains urea which is nitrogen rich which is very important to the plant growth. The urine and faeces are mixed together and therefore is a good source of manure for plant growth.

② Poultry droppings & manure can be used to feed ruminants.

Feather: Used as feather meal when grinded and given to other animal.

It is used to stuff pillow. In the past used for writing when dipped in ink.

Egg: Source of protein. It is also used in vaccine production. Some veterinary station produce poultry for the source of vaccine.

Duck & Geese

They have webbed feet. And therefore have the ability to swim. They can also lay many eggs.

Characteristics that can make birds able to survive in diverse environment.

① They are warm blooded animals. They have a higher body temperature than mammals about 39 - 42°C. This is due to a very fast rate of metabolism.

② The limiting factor for birdlife is water areas like high mountain with low water that does not inhabit birds.

③ Their ability to generate warmth keeps them going. They have no sweat glands. They lose heat by panting.

④ Birds have taste buds that are well-developed. They have differentiate food from non-food e.g sand from feeds.

Also they have olfactory lobes. They show

Preference for food.
5) They also have well developed eyes. Birds have 360° vision. They can see everything around them.
6) The droppings should be firm if not, they are suffering from diarrhoea. If blood is seen in the faeces that means they are suffering from parasite attacks.

ORIGIN OF BREEDS (Pure breeds)

Breeds as they occur in their natural habitat: Generally, breeds are classified according to their origin.

1) Asiatic breeds:
They are heavy fatty birds of breeds - i.e mostly used for meat. Examples are called: cochin, Langshan and Brahma. They are used mostly in broiler production.

2) British class:
characterised by light Sussex, orpington, cornish e.t.c

3) Mediterranean class:
These are generally light breeds mostly used in egg production. Most popular among them is white leghorn. Other examples include Ancona, Minorca and Andalucean.

4) American class (Composite breeds) e.g Rhode island red (R/R), Wyandotte, Ply-mouth rock.

Breeds → A group of related fowls which breeds true to a number of given traits that identify the breed.
Breeds are divided into varieties based on certain traits such as colour of plumage (colour of feather), comb type.

Type: Refers to the purpose on which the poultry are bred. The two general type includes: (1) Egg type
(2) Meat type.

Strain: refers to the geographic origin of the poultry.

Hybrid: chickens that are due for egg & meat production are produced by different system.
Mating or breed crossing or inbreeding. Commercially pure breeds are used. This is crossing two or more breeds.

strain within the same breed.
Breed crossing: crossing different breeds to get the desired traits.
Inbreeding: Inbred chickens are produced by inbreeding and crossing the desired lines to get desired traits.
Most commercial egg producing flocks are made up of white leghorn strain crosses because of their superiority in egg production. High breed or inbred crosses are also popular for egg production.
The leghorn & their crosses are white egg layers whereas the brown-egg layers are the rhode-island layers. These are larger than the leghorn and higher feed cost per egg produced. They are not as popular for larger commercial flocks than the leghorns.
Sometimes, smaller farm flocks use this birds because they produce more meat for home use and are regarded or considered as dual purpose breeds.
However, they are not as efficient in either egg or meat production as types which are bred for one purpose.
Commercial crosses that are bred for meat production are generally used for broiler production (meat) production. A common cross for this purpose is white ply-mouth rock female related to cornish male.
These crosses do not ~~eg~~ high egg layer but are highly efficient and meat producers.

HISTORY OF MODERN POULTRY.

Late sixties → Importation of exotic breeds like R/R, Wyandotte, Barred PMPO breeds are ~~meat birds~~ hybrids. The initial success of this introduction of acquisition which is known as government farms.
Before the introduction of this exotic breeds poultry production followed the purely traditional methods (No feeding and housing and they breed at random) the chicken serves as dual purpose. The marketing was prompted by cash heat. No organized market. Consumption follows no regular pattern.
The place of poultry in the animal agriculture as a unique farm enterprise has

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- Pathological
- Ecological
- Economical constrains which affects commercial production of other breeds & production. e.g Trypanosomiasis (tse-tse fly) affects every other animal except poultry birds. Poultry does not also have ecological constrains because it can breed anywhere as well as no economical constrains because little capital can start up a poultry business.

All other livestock breeds are affected by climatic conditions except poultry birds. Poultry can adapt once provided with adequate housing. Comparative data shows poultry show similar performance of poultry birds in the temperate region and tropical region.

Economical: poultry enjoys agricultural credit than others. especially short-term credit loans.

Poultry has no technical constrains because it has the least demand on land and less skill. Labour requirement is low. In terms of animal protein supply poultry production represents the fastest way of closing the gap of meat production. Because poultry is accepted everywhere, it is practicable everywhere.

12/06/18

DIGESTIVE SYSTEM.

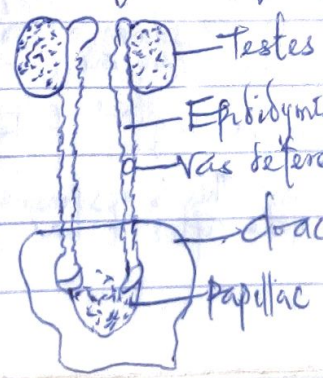
- Chicken do not have teeth, so chewing is not possible.
- The tongue provides some assistance in feeding by helping to force the food down the gullet.
- Little saliva is secreted in the mouth to aid in swallowing.
- The gullet or oesophagus is a canal that leads to the crop and continues until the proventriculus. It has great ability to expand.
- Food is stored temporarily in the crop where some softening and pre-digestion takes place due to the action of enzymes.
- The stomach or proventriculus secretes some gastric juice mainly HCl and pepsin which acts to break down protein to amino acid.
- The gizzard or ventriculus is composed of heavy-like structures which is heavily muscle.
- The involuntary grinding action of the muscular gizzard has a tendency to break down food or food products much as the teeth would do in humans.
- The feeding of insoluble food or pebbles is advantageous especially when birds consume whole grains.
- Most of the digestion takes place in the small intestine. Intestinal juice are enzymes secreted in order to split sugar and other nutrients into more simple forms where they are transported to the blood stream.
- Peristaltic action also takes place there to move materials through the system to the caecum.
- Ruminants have the ability to digest cellulose but because of the passage through the digestive system of the chicken is very rapid (Fast and the only location where bacteria occur to any extent is in the Caeca, little digestion of fibrous feed can occur.
- The caeca has no known function though some bacteria are found in them and very little fibre is digested and so should be disregarded.
- The Large intestine is a continuation of the digestive tract leading from the function of the Caeca, continuing to the rectum (Cloaca).
- The cloaca is a common function for the outlet of the digestive, urinary and genital system.

ACCESSORY ORGAN

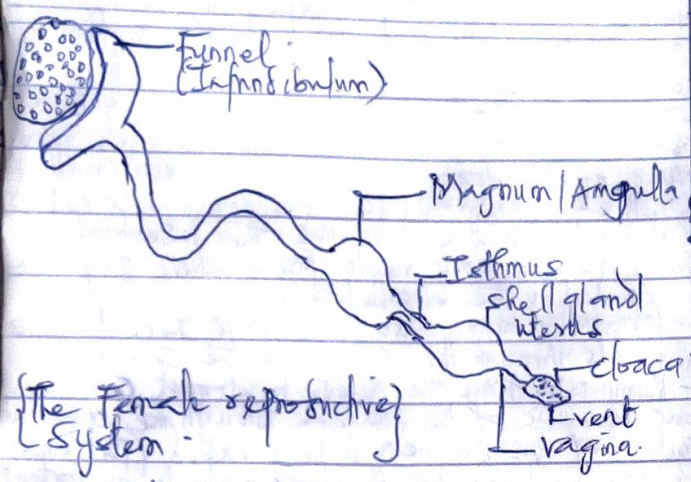
They are the liver and the pancreas, they contribute secretion to digestion although food does not pass through them.

In addition to other functions, the liver secretes bile stored in the gall bladder, and used by the body to emulsify fats in preparation for digestion. The liver also stores readily available energy called glycogen and also breaks down protein waste bites products into Uric acid for excretion by kidneys.

The pancreas secretes enzymes mainly amylase, trypsin and lipase to aid in the digestion of carbohydrates, protein and fats. Sugar metabolism is also regulated by the production of hormones.



The male reproductive system.



{The Female reproductive} System.

The male reproductive organ are;
- Testes
- The epididymis
- The vas deferens.
- The rudimentary copulatory organ located in the cloaca. The male fowl differs from other domestic animal in the testes do not descend into the scrotum but remains in the abdominal cavity along the backbone close to the anterior portion of the kidney.

The testes produces the sperm to fertilize eggs of the female and also reproduce the male hormones, androgen, which is responsible for secondary sex characteristics in male. Such as a bright red plumage (comb) and crowing responsiveness. The sperm is produced in the seminiferous tubules deep within the testes. Sperm released from the testes enters the vas deferens via the epididymis. The vas deferens are small tubes which conduct the sperm.

The vas deferens opens into small fingers like called projections papillae which are located on the dorsal wall and serve as the semen transporting organ. The male fowl also has a rudimentary copulatory organ which has no connection to the vas deferens and is located on the ventral path of the cloaca.

- Merging with the female is mainly a matter of joining cloaca long enough for semen injection.

The female only have the left ovary and oviduct fully developed.

There are 5 clearly defined regions of the oviduct.

1) The funnel or the Infundibulum. This is responsible for picking up the ovum or yoke after it has been ovulated.

2) Magnum/Angulla; Secretes albumen or the whites of eggs.

3) Isthmus - this secretes the shell membrane.

4) Uterus/shell gland; that secretes the shell.

5) Vagina - Here the egg is temporarily stored and expelled when fully formed.

The female reproductive system functions initially through stimulation by the gonadotropic stimulating hormone (GSH) from the anterior pituitary which causes the development of matured yolks or follicles. The ovary is influenced by this stimulation to begin the production of its own hormone (estrogen & progesterone).

Estrogen causes an increase in blood calcium, protein, vitamin and other substances necessary for blood formation.

Estrogen aids the seperation of pelvic bones and enlargement of the veins in preparing the hen for laying. progesterone acts on the hypothalamus gland to produce L.H from the anterior pituitary which causes release of matured follicle/yoke from the ovary.

If sperm are present at this point a fertile egg will be laid otherwise egg production will continue but infertile eggs are produce.

Egg formation

The ovary of the laying hen contains 1000-3000 follicles varying in size from microscopic to the size of the yoke. The smaller yoke begins to ripen approximately 10 days before they are released into the funnel/infundibulum.

The yoke is enclosed by a follicular membrane which attaches it to the ovary. This membrane has one section which acts as a blood vessel, a readily visible streak lacking in the blood vessels called "stigma". This is the point at which the yoke ruptures and releases the ovum at the time of ovulation.

The yoke is then received by the funnel infundibulum, occassionally, a yoke is dropped into the body cavity where it is re-absorbed. The yoke that enters the funnel goes directly to the magnum which is the longest portion of the oviduct. This is where the albumen egg white is secreted to surround the yoke. The yoke continues in a rotating motion down wind the lower portion of the oviduct.

The shell membranes are added by the isthmus. Two membranes, an inner and an outer membrane are formed at this point normally adhering to each other except at one point

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2) Magnum / Angulla; Secretes albumen or the whites of egg.
3) Isthmus:
These membrane separate at the large end of the egg to form the shell.
Egg remains in the uterus / shell gland for the longest period of time normally between 20 hrs and more.
The egg shell is formed here a process requiring approximately 20 hrs. The shell is composed almost entirely of calcium carbonate, deposited on the matrix of protein and mucopolysaccharides. The final layer covering of the shell is known as cuticle.
An organic material protecting the egg from the invasion of harmful bacteria and serving as a seal to reduce moisture loss. It is interesting to know that the major source of calcium carbonate (CaC) that goes into shell formation is the bi-carbonate ions of the blood.
Bi-carbonate is created through a mixture of CO_2 and H_2O in the presence of an enzyme carbonic hydrate. When a hen is panting in hot weather, it increases water loss by the evaporation of the respiratory glands causing a reduction of CO_2 and bicarbonate ion in the blood. This is suspected to be the reason for the thin shell egg layers in very hot weather

Methods of poultry Husbandry

This is the extent to which birds are exposed to sunshine, or infrared rays and pasture. It also describes the housing pattern. There three systems exists.
1) The extensive system permits the fullest exposure to light & pasture.
2) The intensive system practically minimizes this exposure, while in-between the two, the semi intensive system.
A major important difference between them is that the fowl derives nutritional benefits from the extensive system in terms of all classes of nutrients but particularly protein, mineral and vitamins from pastures.
Birds which are managed intensively are usually deprived of their nutritional advantages.

18/06/2018

SYSTEMS OF POULTRY HUSBANDRY.

(Extensive System)
Under this system, the domesticated fowl is exposed to pasture & grazed on pasture land. They are provided with shelter for sleep at night and protection against bad weather. There can be two housing methods under this system. They are;
1) Range shelter
2) Tow unit.
Range shelter: They are temporary shelter which moves along with the birds to prevent exposure to high concentration of their droppings and also prevent over grazing of the pasture land.
The extensive system has now become obsolete because it has a number of disadvantages that makes it uneconomic to practise. Some include;
1) Requires large expanse of land which is becoming increasing source & expensive.
2) Labour requirement is also high to handle routine chores.
3) It exposes birds to extreme weather conditions e.g. excessive heat & high relative humidity which are detrimental to the optimum performance of the birds.
4) Economic losses are high through predators & laying of eggs in the bush.
Advantages are;
The range system is adopted where there is an average area of land which supports only a low stocking rate & restricted grazing. Also, the range system can be adopted for all classes of birds e.g. growers, layers, breeders.
It is also popular for raising fowls because of their excellent foraging ability.
The range system is most suitable for the management of breeding birds & rearing of the future breeding birds, because it allows the hardest & strongest birds to the survival of the fittest.
When excess grass is available, it can be used to fatten cockerels before selling.
The initial capital requirement & the labour involved are small. When wisely used, the pasture is kept in good conditions & the droppings provided manure for the plant crops.
However, the disadvantages outweighs the advantages.

(Intensive System)
Under this system, the housing includes different types such as;

1) Deep litter system
2) Wire & slatted floor system
3) Straw yard system
4) Battery cage system

- It prevents access to pasture and reduces
- also prevents access to sunshine

Often birds are confined in these manner, their requirement for highly balanced diet becomes very critical. In this system, feed maybe more expensive but in the long run it may cost less per unit of product. There is also closer contact among the birds and hence a greater risk of spread of diseases and an increased incidence of vice habit due to more frequent body contact among birds. When birds are housed intensively, there's a standard practise of debeaking.

In this system, buildings are fixed and are more expensive to erect than the poultry building under the extensive or semi-intensive.

Fixed buildings are not easily disposed off if the poultry enterprise is terminated.

Them are:

1) Confinement - It offers the birds the greatest protection from physical hazards and so, the system is suitable for birds of all ages. It also makes the birds have greater environmental control.

2) High concentration of birds permits the most efficient utilization of labour in that the poultry man can reach many birds faster and also, automatic devices can be used such as automatic drinkers & feeders.

3) High stocking rate of birds makes land requirement for the poultry unit very minimal and therefore suitable where land is in short supply and expensive like in urban centres.

4) Associated with the suitability for urban centres is the ease of access for supply of labour, feed & market.

5) Environment inside the poultry house is more conducive for work. All these factors makes for higher efficiency of production in the intensive rather than the extensive system.

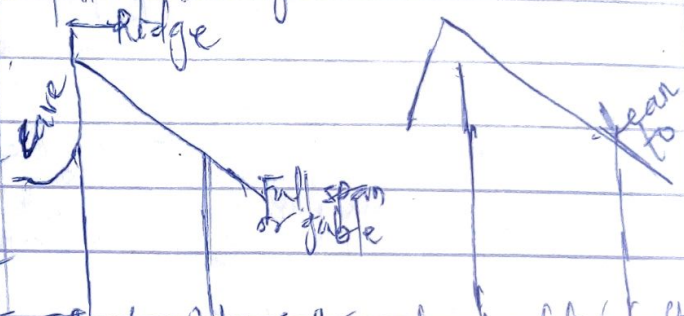
The deep litter system

It consists of a fixed building having suitable litter material spread on the floor. In the temperate (cold region), a window house with provision for environmental control is used but an open-sides house is used in the tropics (hot region).

The deep litter house is variable in size but one that has the capacity for 2,000 - 3,000 birds is considered adequate or economical depending on the ages of birds. Poultry houses are usually rectangular in plan even though you can get square or round houses. They are rare although in the northern areas, round houses are used because of the high velocity of wind which is not common in the tropics.

Large deep litter units can function efficiently only if the width of the house does not exceed 7.2 - 10m and internal fittings are of minimum to permit maximum straight through ventilation.

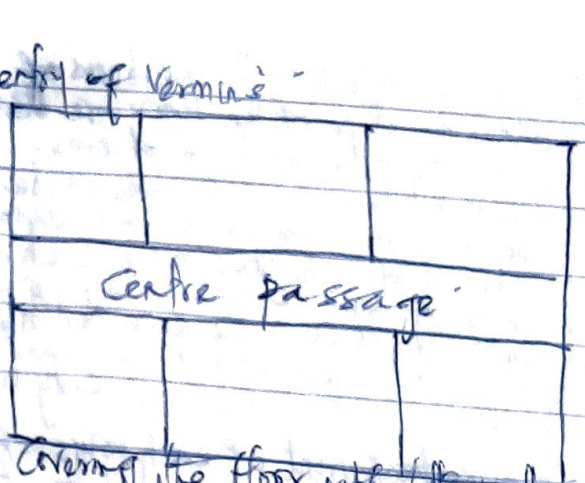
The length of the building is determined by the gradient of the ground (i.e. weather, slatery level) but a maximum length of 2m is commended. The roof of the poultry house may be full span or gable.



The height of the ridge is related to the width of the house. The difference between the ridge and the eave height of the house is 1/4 of the width of the house for houses that are 7.2m or less in width.

Larger houses may have lower ratios of height to width so that they won't be too high. Low roofs create a problem of rain entering into the house with all types of weather. The eave should be long enough to check rain. The floor of the house is usually divided up into pens along the length and sufficiently wide there should be a central passage of what is called a gang way being the length of the house. The floor of deep litter houses should be cemented and strong to prevent the entry of rats & mice. The cemented floor also improves the efficiency of washing the floor clean of the litter material. A floor that is poorly cemented is worse than that which is cemented. Each pen have a ceiling of wire mesh to prevent the

entry of Vermin.



Covering the floor with litter will increase an essential part of the house. Suitable litter materials includes, wood shavings, crushed ears of maize, peanuts from groundnut shell, crushed cereal stems. Dry saw dust is not a suitable material as it may easily pack the nostrils of birds when they peck the litter or they may irritate nasal passages and the throat, stress factor contribution to respiratory disease infection.

- Later material must be water absorbent

Advantages.

The deep litter system shares the advantages of the intensive system already enumerated those advantages that are unique to deep litter system and also associated with litter material include.

- The litter converts poultry droppings into a inert material which is easier to remove and frequency of removal is reduced.
- The litter is used in controlling disease infection largely because the system reduces the concentration of pathogens.
- The presence of litter materials & droppings with their moisture provides a suitable environment for the proliferation and action of pathogens. Because of the presence of micro-organisms there is production of heat and ammonia which helps to control the infection of pathogens on the birds i.e increasing their immunity to diseases.

Also related to disease infection, the litter appears to ameliorate temperature effects by acting as an insulator.

- The action of micro-organism on litter and on droppings produces animal protein factors (APF) which notably include vitamin B_{12} which is essential for development of chick embryo and also hatchability of chicken.

There may be an economic advantage to that litter materials are sometimes obtained more cheaply than any other material that may be used to prevent direct contact between the birds & their droppings or between the birds & the floor.

Management of Deep litter system.

The litter is an asset of a sound condition of the poultry house and of good management. The initial depth of poultry material on the floor should be about 7 cm for chicks. If it is higher than this, the chicks will be practically covered up by the litter which can also be an impediment to their movement. When trampled, the litter tends to decrease & so more litter should be added to maintain the initial depth. The initial depth of litter for grower & adult birds should be 20 - 25 cm as the level of the litter falls and becomes saturated with droppings more fresh litter must be added eventually giving a final litter depth of 20 - 35 cm.

Well-managed litter has a;

1) Crumby consistency.
2) It is friable.
3) Low concentration of pathogens
4) Practically free from NH_3 (ammonia)
5) Difficult to form a ball in the hand as it easily breaks down.
6) It is thoroughly mixed with the droppings.

Poorly managed litter exhibit opposite characteristics and in extreme cases they are;

- Wet or mucky
- Has a pungent odour of ammonia that may affect the eyes of birds.
- It increases diseases risk by acting as a favourable medium for development of pathogens that can resist the destructive effect of ammonia.

The accumulation of ammonia in the litter due to poor management is injurious to birds and is incompatible with the level of performance.

Wet litter material provides a suitable medium for the growth of aspergillus which causes aspergillosis and coccidia.

Wet litter is unsearable. The satisfying management of litter should start with the initial provision of enough quantity of the material so as to obtain the right ratios of litters to droppings or to obtain litter at the right consistency. As soon as there's an excess

of droppings, more litter should be added. The litter should be turned with a rake daily or three times weekly to ensure that the droppings are thoroughly mixed with litter. Water drinkers should be placed on low platforms. Wet litters should be removed frequently or mixed with dry litter. Water drinkers should not be over-filled & should be stable when considered on the height, size and number of birds. The litter should be changed from time to time not later than 10-12 months. Litter should be removed with each batch of birds to prevent transmission of disease through old litter. Among the litter transmissible diseases include: Salmonella, Pullorum, BWD, Infectious bronchitis, Newcastle Diseases, fowl typhoid etc

Wire and slatted floor system:

In this system, instead of material mesh wire is used to cover the cemented floor so that the droppings may be accumulated so that the birds are not sitting on the floor.

The wire floor is raised 0.6-0.9m above the cemented floor so that the droppings are accumulated on the cemented floor so that the birds are safe from direct contact with the droppings.

The cost of constructing the wire may be higher than providing the litter but the problems may be avoided. This system is unpopular because of the problems of egg breakages and breast blisters in broilers. While there is no evidence that the birds on the wire floor are under stress which may just predispose the birds to vice habit.

* The battery cage system:

In this cage system, the birds are housed in individual compartments according each accommodating a limited number of birds mostly 2 or 3 but can be as to four (4) per cage. This individual cage compartment is the basic component unit of the birds system and it is essentially a flying nest with the sloppy floor having feed and water troughs.

The cage unit is constructed to permit ventilation on all sides & usually all the sides, the top and the floor are constructed of heavy galvanized iron. The dimension of the cage is not rigidly fixed but most cages have on the average 45cm front, 45cm and 45cm left, while the sloppy floor that tends forward and folds gently to form the cradle from which eggs are collected. The hardness of the material and the slope of the floor are disadvantages often causing the breakage of eggs.

They are arranged in rows which shares side walls and the rows are arranged in tiers starting from about a height of 0.3-0.6m and reaching a height of about 4.5m. The tiers varies from 3-6 in number. Two rows in the same tier face opposite direction and the respective cage compartments are back-to-back and not necessarily in contact.

Running in contact front of each rows of compartments are trough feeders and in most cases water troughs. The cage units differ in the number of compartment they include. The main body work of cages is mostly of wire, also are the legs and the feed trough while the water trough is made of aluminium to prevent rust. Cage system may differ in the arrangement of the rows in the tiers.

The tiers may be arranged vertical, the rows in each tiers making contact and facing opposite direction, between adjacent tiers are droppings board made of galvanized steel and wire cast steel and wire cast glass which are used for droppings collection.

There is also the step-down or California design in this case, the rows of tiers face opposite direction but only those in the topmost tier are in contact.

Cages vary in their degree of automation. On the other hand, all operations may be manual while on the other hand extreme, practically all the various operations includes manure removal may be automatic.

Advantages of cage system:

1) Birds are free from the various problems associated with mutual contact or social friction resulting in vice habit and stress, birds are free from that - pecking which predispose birds to diseases are avoided.

Birds suffering from infection diseases are automatically confined and spread of disease is controlled.

2) Birds are less exposed to diseased organism since no contact exist between them and the droppings. They are also less predispose to infections because the exposure of birds to litter, ammonia and their mutual contact is minimized.

3) Birds are easier to manage, feed and water condition is directed in a more

comfortable position of standing or bending slightly, keeping the birds in seperate compartments simplifies the identification of birds. It is less easy for birds to feed on eggs thereby, developing egg eating habits.

The only disadvantage that used to be associated with this system is the assumed high initial capital outlay largely on account of the cage. But, studies show that it may cost about the same to house a bird in the cage or on deep litter.

The system is useful largely for managing adult birds & layers. It is not yet of importance in producing broilers because the floor is not very suitable for chicks and it may cause breast-blister in adult birds.

The cage system is also considered to cause stress among birds and therefore, its use is discriminated against in some countries, while in other countries, the number of birds per cage is specified. Birds managed under this system occassionally suffers from cage fatigue & kind of leg weakness of unknown cause.

We also have the semi-intensive system. Like the intensive system, the semi-intensive system has largely become obsolete. It was once popular largely for breeding birds on the assumption that it impacted physical staming in the birds and thereby enabling them to withstand the strain of egg production when they become layers.

The main feature of this system is the fixed building and attached runs/fence pastures. There should be at least two runs to permit rotational grazing. The system combines the advantages and disadvantages of both intensive & extensive system.

Poultry Equipments & Appliances.

Poultry houses cannot function satisfactorily unless they are probably equipped and supplied with appliances which are basic requirements for the successful management of fowl.

Poultry equipment & appliances varies from simple to complex, from the most rekementary to the most advanced electronic devices. Poultry appliances can be broadly grouped into;

- General application
- Specific application

Those of general use includes;

- Feeders
- Drinkers
- Crates.

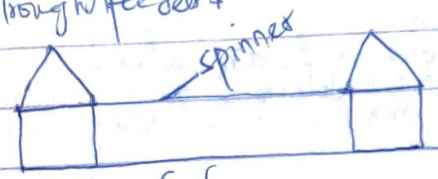
Appliances used at various stages of growth are;

- Brooders for chicks.
- Nests for layers.

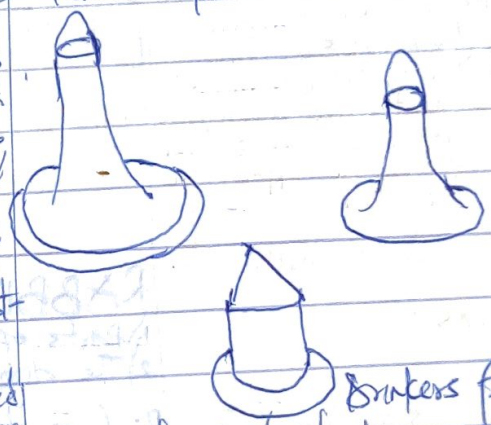
The construction of feeders is such as to avoid wastes as fowling, droppings and litter, easy to clean and wash and constructing of durable material. If timber is used, preservatives like solignum is used to prevent fungi or insect damage.

Two types of feeders are;

- Trough feeders



- Tubular feeders.



Drinkers feed

The galvanized drinker may not be durable. The aluminium may be rust resistant, durable or expensive.

Stages of Development & management operation

Stages of growth	Age of fowl	Management operation
1) Embryo	21 to day 1 after hatching	Incubation
2) chick	0-6 or 8 weeks	Brooding
	0-8 or 10 weeks	
3) Grower (pullet grower/cockerel)	6 or 8 wks to 20 wks	Rearing
4) Layers	20 or 24 wks to 58 wks (The first year)	Management of layers
a) pullet layer	22 wks to 80 weeks	Management of layers end
b) Hen layer	2 days in lay	
5) Breeders (Male or female (Cock or Cock))	Above points of lay	Management of breeders

First stage includes:
Brooding stage: The brooding refers to early period of growth where young chicks are unable to maintain body temperature without the age of the supplement heat (This is because the young chick hasn't developed feather).
It normally lasts from 1 day old to 3 weeks of age and the primary management operation entails:
- Provision of heat
- Water and feed.
- Air Circulation.
When we combine heat, air, water, feed efficiently, it will determine the level of physical and physiological development.

03/07/2018
In the brooding house, we have an equipment called BROODER and you raise the brooder to 0.3 - 0.6m high. During brooding we must make adequate preparations. Firstly, clean the brooder house at least 3 weeks before the birds are recommendation for litter
Chicks ⇒ 2-5cm
About 2 hrs of arrival, you supply water and feed

Classes of birds.
- Layers
- Broilers.
Brood for 6-8 weeks for layers, then you reduce source of heat on pullet, brood for 6-8 weeks, first feed for pullets is chicks
Mash from 0-6 or 8 weeks
Broiler start feeds for broilers.

Types of feed
Chicks mash; Grower or layers
Growers; 8-10 weeks point of lay
Layers; 20 wks and above
Broiler; 8-10 wks, then, they are good for marketing

Brooding management (Rearing Layer breeder).
Rearing is the care that is given to birds immediately after the brooding stage.
Vaccination for brooding is called IO (Intramuscular ocular).
The feed will be different, then you introduce the growers mash. Space requirement will be higher because of their adult stage. As they grow, the weight increase, the drinker & the feeder will increase in size.
Precocious maturity under rearing of birds.

Layer breeders; Introduce the laying mash. The feeds for layers are different, they have slightly higher content than the growers, then you increase the calcium content of the feeds so they will be able to form their shell. At the point the egg is dropping, it is called the point of lay. During laying, there is a pattern of lay.

Broilers; This is a bird that is bred and selected for rapidly fast growth and selected for conformation that is ideal for meat consumption formation
Characteristics of broiler breeding.
- It feathers very fast
- It must be fast growing.
- It is consumable for meat production.

N.B; The Asian breeds are the heavy table birds

RABBIT PRODUCTION 10/07/2018
1) Parts of the body of rabbits.
2) The digestive system.
Biological classification of rabbits.
Feed Conversion ratio = $\frac{\text{Grain feeds}}{\text{the weight of the animal}}$

17/07/18
Types of rearing systems.
- Extensive system
- Intensive system.
- Semi-Intensive system

Types of rabbit faeces
- Soft faeces
- Hard faeces

General management practices
- The animal to be used for breeding must be given an

Vitamin
A - eyes
B - Brain development
C - Immune system stabilisation
D - Bone formation
E - Anti-oxidants
K - Clotting of blood.

Identification

- Seperate the male and female at early stage to avoid indiscriminate mating.
- Proper farm record should be taken on a daily basis.

Reproduction

This is a complex process controlled by hormones which are produced in the endocrine glands. The female reproductive system consists of ovaries, fallopian tubes or oviduct, cervix, vagina and mammary glands. For the male reproductive system, vas deferens, testicles, penis e.t.c

Selection for breeding

- The rabbit should be free from the signs of diseases
- The breeding stock should be selected from good quality rabbits
- Rabbits with the largest litter should be selected.
- The male should be checked to see if it has testicles.

Gestation period = 31-33 days

Homeostasis - A balanced ~~state~~ body state of regulated body temp.
N.F.E - Nitrogen free extract.

External parasites
- Flies
- Fleas
- Mice.

Rabbit Production

Kingdom	Animalia.
Phylum	Chordata.
Sub phylum	Vertebrata.
Class	Mammalia
Order	Lagomorpha.
Family	Oryctolagus.
Genus	Oryctolagus
Species	Cuniculus

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SWINE (PIG) PRODUCTION

- In some countries such as Papua New guinea the pig is seen as a source of wealth and for marriage rites.
- Pigs are lucrative i.e input of small capital but later, good returns are gotten from it
- Pigs are one of the earliest domesticated animals.

* Religions where it is a taboo to eat pigs
- Judaism (Jews).
- Islam

and Countries like Indonesia, Pakistan.

The skin of pigs can be used as leather produce e.g football. The skin of pigs e very tough, does not tear easily
- Products from pigs are: (bacon, sausage, ork, hamburgers etc).
- Pigs has lots of oil on their body which can be refined and used for cooking.
- Some breeds of pigs have furs and are used to produce brushes.
- Hooves of pigs can be used to make some artifical nails and combs, buttons inclusive.
- Pigs produce puppy milk which can be used to feed the young ones of other mammals.
- Faecal waste from pigs can be used as manure for farmlands & fish ponds for proper fertilization.
- Pigs has a lot of blood, they can be used in producing blood meal as source of feed to other animals.
- Pigs can be used to generate electricity in form of biogas.
- Pig bones can be burnt, crushed and used to produce calcium source a major component of the bone meal (a kind of feed)
- The hearts of pigs are similar to that of humans and are used in transplanting when necessary in humans.
- They are also used for research.
- The intestines of pigs after proper cleaning to remove faeces can be dried and used in the preparation of meat meal.
- Pigs serves as a source of revenue in the ways
* Roasted and sold already make
* stored in refrigerators and sold raw.
* They can also be used as souvenirs.
* Also provides foreign exchange earning.
- Hooves can also be used for the production of gelatin & glue.
- Farrowing is the act of giving birth to young ones (piglets). In one litter, it could yield up to fifteen (15) piglets.
* Gilt - Sexually matured female but has never farrowed
* Sow - A female pig that has farrowed
* Boar - A sexually matured male
* Barrow - A castrated male
* Dam - A female parent.
* Sire - A male parent.
* Stag - A castrated matured male
- Lard is the fats gotten from pigs that are used for cooking
* Piglet - A young pig

* pig's growth process

Piglets
↓
Weaners
↓
Growers
↓
Boars / Barrows

* Wallowing - provides an avenue for the pigs to tumble & roll about in mire

Importance of castration

- Reduces odour
- Allows animals to utilize energy to grow

Economic Importance of pigs

* If not properly managed, odour will pollute the environment
* High cost of breeding & maintenance

Why do pigs wallow?

- Pigs wallow in order to reduce temperature which improves spermatogenesis (production of sperm) - pigs has a lot of fat layers under the skin which does not allow for ventilation.
* If fed well, pigs matures between 6-8 months

31/07/2018

The most popular breeds of pigs are;

- Large white
- Land race
- Duroc
- Hampshire
- Chester white
- Tamworth
- Berkshire
- Yorkshire
- Large black
- Middle white
- Poland China
- Bakosi
- Ashanti Dwarf
- British saddle back
- (Indigenous breeds)

* Pigs are prolific animals ie they can produce many offsprings in one litter. But if malnourished they produce very little.
* Pigs are monogastric animals.
* They feed on varieties of feedstuffs but do better with concentrates (Hay, forages, farm and kitchen wastes).
* Pigs can be reared; - Intensively
  - Semi Intensively.

They can also be reared extensively. However, it is not an advisable method because pigs eat plantations

* Their mating ratio is 1:5-10 depending on the strength of the boar
* The heat period is only embarked on by the female animal and its a period of sexual desire.

Signs of heat

- Redness of the vulva
- It could be swollen (ie the vulva)

- The animal would be restless.
- Attempt at mounting other animals.
- Standing heat (ie readiness of the animal)

Signs to detect pregnancy in pigs.

- Signs of heat wouldn't appear
- They would be calm and quiet
- They refuse to be mounted by a boar.
- Protruding teats/nipples.
- Protruding & gradually increasing belly.
- Increase in body weight.

Gestation; This covers the period from the fertilization of an egg (ovum) to the delivery of the young ones.

Gestation period of pigs is about 3 months and 3 weeks (114 - 116 days.

Methods of mating in pigs.

1) Hand-mating; This is done at the discretion of the farmer. The farmer determines which boar and sow should come together in mating in order to produce similar offsprings deliberately.

2) Pen-mating; This kind of mating is carried out in pens when the farmer mixes up the boar and soar depending on his mating ratio and the strength of the boars for mating purpose.

3) Artificial Insemination; In this method, a farmer selects a very good boar, collects its semen and it is put in the vagina of the female (ie the dummy female) for reproduction. This method is really expensive due to the equipments needed and availability of specialists.

Disadvantages of ~~pig~~ pigs mating.

- No accurate notification for the pig mating.
- The date the sow was mated can't be predicted

Methods of managing pigs (management practices)

*At farrowing, an attendant should be available

- To remove umbilical cord.
- To assist the sow in cases of multiple farrowing
- To move the piglets away from the point of farrowing
- To provide (glucose + water) solution for the sow when they become weak.
- To make use of farrowing wheel to avoid direct contact of the sow and piglets.
- To attach the piglet to the sow in order to have them suck the colostrum (the milk produced within 3-5 days of farrowing. It contains anti-bodies that converges immunity for the piglets).
- Ensure the sow is well fed to stimulate the secretion of enough colostrum
- To provide milk substitute for the weak

piglets who might not have access to the colostrum to prevent death.
- To present the creep feed (It has 20-25% crude protein) (It possesses 2400 kal of energy as it helps the piglets grow faster).
* While feeding pigs,
- Starter mash - Weaners.
- Grower mash - Growers.
- Finisher mash - Matured ones.

After about 3 days to 1 week, the piglets should be given iron injection. (It contains haemoglobin that aids the proper functioning of the red blood cells.
* Identification of pigs; It is used to determine specific pigs e.g those for research, breeding and reproduction.
- Using names
- Tattoos
- Making use of Indelible markers to write numbers or any other identification mark.
* Health management; To identify sick pigs;
- Dull eyes.
- They isolate themselves.
- Discharge from their natural orifices (openings) Nostrils, eyes, vulva, e.t.c.

Zoonotic; diseases that are easily transmitted by humans from animal to man.

- Difference in temperature.
- Emaciation; Loss of weight.
- The colour of the animal becomes pale.
- changes in the colour & consistency of faeces
- changes in the colour of urine and the act of urination.
- Increase in the rate and depth of respiration
- Loss of appetite.

Some Common diseases of pigs are;
* African swine fever (viral disease & contagious)
* Foot and mouth disease (viral disease)
* Trypanosomiasis (protozoan disease; trypanosoma) tse-tse fly
- Coccidiosis (protozoan disease; severe diarrhea)
- Anthrax (~~mycoplasmic~~ Bacterial disease).
- Emizypelas (swine Emizypelas).
- Sunburn
- Mastitis
- Pneumonia (mycoplasmic disease)
* Nutritional deficiencies
* Parasites & pest (mites, fleas, flies e.t.c)
* Endoparasites (Round worms, tape worms e.t.c)

Effects.
- They become anaemic
- They can't digize or metabolise their feeds.
- They incure wounds on the animals.