CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 CONCEPTUAL FRAMEWORK

Over the years,broilers production has become a means to fight the problem of unemployment and underemployment in Nigeria; as well serves as a source of income for the citizenry of Nigeria. Parkhurt and Mountriey (1998) considered poultry to collectively design species of birds which are domesticated to produce and grow in captivity so as to render the product of economic value. Chickens, turkey, ducks, geese, some quail and pheasant, guineas and pigeons generally meet the above criteria. They provide meat, egg, fertilizer, animal food and other by-product such as pharmaceutical. They also serve as laboratory purpose for scientific research. Broilers are chickens (Gallus Gallus domesticus) bred that are raised specifically for meat production. In recent time,chicken are one the most common wide spread domestic animal, and with a population of 19 billion in 2011, there are more chickens in the world than any other species of birds. Typical broiler have white feather and yellowish skin and most commercial broiler bred raised for meat reach slaugther weight at between 5 to7 weeks of age (Keany, 2003).

However, there is a growing body of literature on brooding management of broiler. A critical analysis shows change and continuity in agricultural technology. Let us examine below some of the issues. Brooding refers to the management of chicks bectween day old and 8 weeks of age.

According to Hellin et.al (2015) management refers to a multifactorrial practice of rearing, production techniques that helps to maximize the efficiency of production. Thereby, raising domesticated birds such as chickens, duck, turkey, and geese to produce meat and egg for food.

2.1.1 HOUSING MANAGEMENT

Birds are raised under intensive system of management are usually housed instruction and quality of poultry house depend on the farmer capability. Poultry vary from small shed to costly complex. The size of poultry depends on the numbers to be kept in the pen. The table below show the recommended floor space for birds/chicken.

Age in weeks	Space/M Birds	Birds space metre
0-4 brooder house	0.05-0.8	12.20
4-8 weeks	0.10	10
8-20 rearing	0.20	5
20 or more	0.25	4

Source: FAO (2023)

FOUNDATION

This supports the building, should be strong and deep at least 0.3m in soil to prevent rodent from borrowing through and heaving by frost and should be high enough to prevent surface water from running into the house.

FLOOR

The floor of the brooder house can be made of several should be water proof (i.e avoiding water materials and inlet), rat proof free racks and easy to clean and durable as rat can grow the wood, clay floor can also be used for deeplitter but it can chick and allow rodent infestation.

FLOOR SPACE REQUIREMENT

0.19m square per chicks is mostly appropriate for broilers and layers chicks in small flocks. However, this area could also be reduced in case of large floors for commercial purposes.

WALL

The walls are expected to be in solid enough to supports the roofs and withstand winds,between the roof and two coaches of block for foundation is a wire mesh, design to provide for floor through ventilation and also prevent wild animals from entry.

FENCING

Fencing of about 2m high using wire digging 60cm into the ground and angling outward from the pen should be done outside the brooding house prevent predator such rat, mole, foxes, snake e.t.c to prevent hawk, life size replica of plastic make owl should be placed on top of the poultry houses.

2.1.2 MEANING OF BROODING

Brooding refers to the management of chicks between day old and 6 weeks of age. The brooding direction varies in other poultry species. Brooding period is the most critical time in post hatch period of the chicken's life and is highly prone to mortality as such effort is made to enhance livability while reducing mortality. So, brooding is the period immediately after hatching when the chicks need special care and management for their survival.

2.1.3 TYPE OF BROODING

1. NATURAL (HEN) BROODING
2. ARTIFICIAL BROODING
3. COLD ROOM (FLOOR) BROODING
4. WARM ROOM BROODING

NATURAL (HEN) BROODING

This is the simplest way of hatching a small number of eggs where a broody hen (chicken) will incubate her own eggs or those of another hen or a ducks.this is done with the help of broody hens after hatch up to 3 to 4 weeks.

ARTIFICIAL BROODING

This is done by means of a temperature controlled brooder. It's the process of handling a new born chicks without the aid of hen and it's accomplished by means of temperature controlled brooder (frost brooder)

COLD ROOM (FLOOR) BROODING

In this system, specific area of the house are heated to 32 degree celcius-35 degree celcius while the rest of the room is cooled. The area heated is usually enclosed in a chick guard, which prevent the chicks from wandering from the source of heat

WARM ROOM BROODING

This is the type of brooding where the whole room is uniformly heated temperature varying from 28 degree celcius – 32 degree celcius.

2.1.4 BROODING REQUIREMENT

1. TEMPERATURE
2. LIGHTING
3. RELATIVE HUMIDITY
4. VENTILATION

TEMPERATURE

Beginning at one day of age, the chick should be housed at a temperature between 87-92 degree farehient (32-32 degree celcius) at a relative humidity between 40-60%. Care should be taken to prevent the chicks from being exposed to drafts which could result in wind chill when the chicks is one week of age the temperature can be reduce

by 4 degree Fahrenheit (2 degree celcius) continue reducing the temperature until housing temperature of 70 degree farehient (21 degree celcius) is reached.

LIGHTING

Lighting for 1 day old bird should begin at 20-22 hours per day for day for the first two day 7 at 10lux (iftx) intensity reduced length weekly to react approximately 12 hours of ligts at 8weeks of ages.

RELATIVE UMIDITY

A relative humidity of 50-70% is recommended for the brooding of chicks.excessively high relative humidity encourages for growth of mould and pathogenic organism especially coccidiosis two low relative humidity leads to dehydration of the chicks.

VENTILATION

Adequate ventilation is required for the well being of the chicks. The role of good ventilation in general of poultry house is to replenish oxygen, remove ammonia and excess water and to keep the optimum temperature as chicks grow older, this curtains should be opened

2.1.5 BROODING EQUIPMENT

1. Feeding equipment

a. Automatic pan feeder

b. Circular feeder

c. Lincer feeder

d. Trough feeder

e. Tray feeder

d. shell grift box

2. BROODER EQUIPMENT

a. Charcoal and coal pot

b. Lantern

c. Electric lamp brooder

d. Brooder guard

e. Infrared bulbs.

3. WATER EQUIPMENT

a. water softness and fiters

b. water neater

c. pain and joy type

d. nipple drinkers etc.

2.1.5 SYSTEM OF BROODING AND MANAGEMENT OF POULTRY

This system refers to the extent to which the the birds irrespective of species of poultry are exposed to sunlight and pasture. It also describes the housing pattern. There are several systems of poultry management namely;

1. EXTENSIVE SYSTEM
2. SEMI INTENSIVE SYSTEM
3. INTENSIVE SYSTEM

EXTENSIVE SYSTEM

This System is also called the free range system that provide complete freedom of movement and exposure of the birds to sunshine and pasture. In this system, birds are given a few grains in the morning, the birds are usually not housed and birds can be seen sleeping on roofs, trees branches or in coops provided by the owners.

SEMI INTENSIVE SYSTEM

In this system, birds reared in this system are characterized by the presence of fixed unit, which act as shelter and a number of fenced runs attached to the fixed unit. The fixed unit could be a real poultry housed. Birds stay in the house and have freedom of moving into the runs to scavenge for insects and pasture during the day and move back into the fixed unit during increment weather and for roosting in the evening. The use of several runs attached to the fixed unit allows for rotational grazing of the runs.

INTENSIVE SYSTEM

This is the system used in the present day commercial poultry production. Unlike the other system, the movement of the birds are restricted to a fixed house and are not exposed to sunshine and pasture. Instead, they are housed in fixed unit, which permit high stocking density and saves labour. This system also provides protection against theft, predators and adverse weather conditions. The intensive system of management is highly flexible and encourages the adoption of the latest

technology advancements to increase the produce performance of the birds.this system hence is more sufficient than the other two system of management.

2.1.6 BROODING MANAGEMNENT OF DAY OLD CHICKS (BROILERS)

PREPARATION FOR THE ARRIVAL OF CHICKS

Preparation for brooding of chicks usually started, long before their arrival on the farm./in fact preparation is started as soon as the house is depopulated of the older birds.the old litter in the house should be heaped, removed and hauled far away from the premises this should take 3-4 weeks before the arrival of the chicks the debris and cobwebs in the house are removed before subjecting the house to thorough cleaning and scrubbing,preferably with the aid of a pressure pump. The equipment are scrapped and washed before they are disinfected along with the house as the house

can be made air tight.it should be fumigated with formaldehyde the bulk feed bin should also be fumigated the surrounding of the building should also be cleaned all these should be done such that the remain unpopulated for 1 to 2weeks before placing chicks in two days before the arrival of the chicks,new litter should be spread to a depth of about 5-7cm if the floor brooding is to be used place the appliances to their correct positions and test them to make sure they work, make repair where necessary the heating device is turned on and a pilot light should he positioned near the heater.

It is preferable for the chicks to arrive on the farm in the morning give them the whole day to eat and drink and be under close observation by the attendant.on the arrival at the farm.count and record the numbers of chicks before they are unboxed near the hover feed and water are supplied, although it is preferable that water is supplied before feed.this is to reduce the risks of dehydration.day old vaccination should be given if not already the hatchery.

2.1.7 PRECAUTION TO BE TAKEN WHILE BROODING CHICKS

The first precaution towards achieving the goals is to brood chicks in isolation. Brooding house should not be located near houses for the older poultry to avoid disease transmission.nearest poultry should be at least 50cm away where possible,a fence with a single gate should be provided round the brooder house the second precaution is to practice all-in and all-out system of management.birds in one hose should be of similar age with the older not more than a weeks older than the youngest birds in the same house should be started and removed at house,a resting period of several weeks is allowed in the period when there will be no chicks in the house, thus breaking the life cycle of disease causing micro organism

2.1.8 DRUGS AND VACCINATION PROGRAM FOR POULTRY BIRDS (BROILERS)

Many poultry diseases can be prevented by good management practices, including sanitation adequate feeding, well ventilated houses e.t.c. However, some diseases particularly viral and bacterial diseases could easily and rapidly spread and can result in a high death toll. The most reasonable approach to the control of these diseases is by vaccination. The following shows the vaccination and drug scheduled for poultry birds (broilers):

Days	Weeks	Type of vaccination	Mode of vaccination
Day 1-5	1	Glucose and multivitamin	In drinking water
10	2	Gumboro vaccine (1^{st} dose)	Water
14	2	Lasota vaccine (1^{st} dose)	Water
21	3	Gumboro vaccine (2^{nd} dose)	Water
28	4	Lasota vaccine (2^{nd} dose)	Water

Source: FAO, 2023

2.1.9 DISEASE OUTBREAK

Exotic Newcastle Disease (END) is a contagious and fatal viral diseases that affects all birds species. It is one of the most infectious poultry disease in the world. END is deadly that many die without showing any signs of disease. In unvaccinated poultry

flocks, a death rate of almost 100% can occur and END can cause death even in vaccinated poultry.

Poultry hobbyist and owners of pet birds should be careful because birds illegally smuggled into the United States are not quarantined and tested by US Department of agricultural and therefore, many carry the virus.

MODE OF TRANSMISSION

Exotic Newcastle Disease (END) spreads;

1. Primarily through direct contact between healthy birds and the bodily discharge of infected birds
2. Rapidly among birds kept in confinement such as commercially raised chickens and turkeys.
3. Through exposure to virus bearing materials picked up on shoes,clothing.equipment and vehicles.

NEWCASTLE DISEASE [END] PERIOD OF SURVIVAL

This virus end can survive in the warm and humid environment for several weeks, this environment could be bird feathers, manure and other materials. However the virus can be mitigated by dehydration, or sunlight.

CLINICAL SIGNS OF END

1. Sneezing, gasping, nasal discharge and coughing.
2. Greenish faeces and watery diarrhea.
3. Depression, muscular tremors, drooping wings, twisting of head and neck, circling and paralysis.
4. Production of thin shell-egg.
5. Swelling of tissues around the eyes and in the neck
6. Sudden death and a high death rate in infected flocks

PREVENTION OF EXOTIC NEWCASTLE DISESASE (END)

END can be prevented through sound vaccination program and practicing bio-security. Also, avoid contact with pet birds that belongs to others, game, food and live birds market.

PULLORUM TYPHIOD (PT) are host adopted with all the type of fowl being vulnerable to infections. Broiler are very prone to the disease. Chickens are susceptible to pullorum-typhiod disease. However broiler hens and rooster can carry the bacteria often times doing without showing any outward sign of infection.

MODE OF TRANSMISSION

Pullorum typhiod spread primarily from hen to young hatching directly the egg,often localized in the reproductive organs of a disease female. It can also be transmitted through the digestive and respiratory secretion of infected birds.

PULLORUM TYPHIOD (PT) PERIOD OF SURVIVAL

Pullorum typhiod bacteria can live in birds or eggs for more than few weeks in the appropriate temperatures the bacteria can also be activated in extreme freezing temperatures and killed in extreme heat.

CLINICAL SIGN OF (PT)

1. Signs of swelling in joints of adult birds.
2. Several lesion on many of the internal organs.
3. White pasty excrement or white diarrhea.

PULLORUM TYPHIOD PREVENTION

Pullorum typhoid can be prevented by monitoring high hygiene condition by disinfecting the poultry house before stocking also wet feed should be discouraged by properly positioning the prevent constant spoilage.

2.2.0 LITTER MANAGEMENT

Litter management such as wood shavings, sawdust, paddyhusk, peanut shell, paddy chaff straw and such other materials that absorb moisture well can be used depending upon the cost and availability spread the litter to a depth of 5cm on the floor before introducing chicks and build it up to a depth of 15cm by adding litter material at the rate of about 2cm per week, this would require approximately 10kg of litter material sq metre litter should be raked thoroughly at frequently interval at least twice a weeks during the cold season and rainy season once a week during the hot season and the day after deworming, litter should be kept dry always.during the cold and rainy season and on the area of floor where watering utensils are placed special attention should be paid daily to check the litter condition

LIGHT

Artificial light should be discontinued from the time the chicks no more require additional warmth dim light of a 4 watt bulb for every 250 chicks can be provided during the night for broiler chicks

POINT TO BE CONSIDERED WHILE ADOPTING DEEPLITTER SYSTEM

The deeplitter system should always be kept dry and also right numbers of birds should be housed the house should be well ventilated. The Inter should be stirred at least once in a week wet litter if any should he replaced immediately with new dry litter and birds must be fed a balanced ratio the time starting deeplitter system should be in the dry period of the year as it allows sufficient time at least two weeks for bacterial action placing of water should be given due attention to keep litter dry.

TYPE OF LITTER IN POULTRY BIRD

1.Pine shaving

2.Hard wood shaving

3.Pine or hardwood chips

4.Rice hulls

5.Peanut hulls and crushed corn cobs.

6.Chopped straw

7.Hay or con straw

8.Processed paper

In general, the best litter suitable for poultry bird is wood shaving from a softwood,such as pine, spruce or hemlock.however, this material has become expensive to use as litter in poultry house due to the dramatic increase in demand in the last few years

ADVANTAGES OF LITTER MANAGEMENT

1. Dry litter help to control ammonia levels thus providing a healthy flocks environment.
2. It reduce condemnations due to hock and foot pad burns and blisters.
3. Dry litter is important for the health and welfare of the birds as

DISADVANTAGES OF LITTER MANAGEMENT

1. It needs ample time and ventilation prior to brooding to assure dryness.
2. It is more difficult to maintain suitable floor temperature during cold weather brooding.

2.2.1 FEEDING MANAGEMENT

Broiler birds are fed ad-libitum ile availability of water and feed the birds should be feed regularly. Broiler are fed broiler starter at 0-4 weeks of age and broiler finisher at 5-8 weeks of age the protein content required by broiler chickens varies between 21-22%. The energy content required for the birds is 3600%.broiler starter contains an energy content of 2800kcal/kg while broiler finisher contain an energy content of 3000kcal/kg. Good ventilation are required for better performance