

**TRAINING MANUAL**  
**ON**  
**POULTRY(BROILER) PRODUCTION**  
**AND**  
**MANAGEMENT**

## **BROILER CHICKEN PRODUCTION AND MANAGEMENT**



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### **MODULE 1**

#### **OVERVIEW OF POULTRY PRODUCTION IN DEVELOPING AND UNDERDEVELOPED COUNTRIES: IMPORTANCE AND CHALLENGES**

## **1.1 Introduction**

Poultry refers to domesticated avian species (birds) that are raised for their eggs and /or meat. It includes turkey, duck, geese, pheasant, quail, guinea fowl, pigeons and chickens. Chickens are the most abundant and commonly raised poultry. Food and Agriculture Organization (FAO) recommended that 35g out of the required minimum of 65-72g of reference protein should be obtained from animal products. However, the average animal protein intake per capita per day in Nigeria and other countries in Sub-Saharan Africa fluctuate between 7.6 and 13.26g and this is widely acknowledged to be inadequate. Poultry, because of its enormous potentials, can be explored to bridge the animal protein shortage gap.

## **1.2 Importance of Poultry**

### **1.2.1 Food Supply**

Poultry provides cheap and good quality meat. Chickens, being the most common and abundant of the poultry provide excellent animal protein (22.8% crude protein), with high bio-availability, low fat (0.9%) and high mineral content (1.2%). It is also rich in Phosphorus (240mg) and Vitamin A (200mg), among others (Table 1). Poultry meat has emerged as healthier substitute to beef and mutton.

### **1.2.2. Fast growth rate and high efficiency of Feed utilization**

Poultry utilize high quality feed to produce meat and eggs in a highly efficient way and at a faster rate compared to cattle, sheep and goat. For instance, broiler chicken attains minimum of 2kg live weight in 49-56days and has high feed conversion efficiency.

### **1.2.3. Less Land use and environmental Impact**

Poultry production requires relatively small area of land compared to other livestock. Also among all livestock, poultry contribute least of the green-house gases that have been blamed for aggravating global warming and causing climate change.

### **1.2.4. Soil fertility improvement and maintenance**

Poultry manure is the most common and preferred fertilizer for soil amendments in organic operations. It is rich in soil essential nutrients (Nitrogen, Phosphorus, Potassium, Calcium, Sulphur and so on) that aid crop production. It is used to improve soil structure; increase the level of organic matter in the soil and increase the soil water holding capacity. It is economical and environmentally friendly (Table 2). Poultry manure could also be useful for fertilizing fish pond and methane gas generation for cooking or heating on the farm.

### **1.2.5. Job Creation**

Through poultry production, jobs are created along the value chain. Jobs are created for attendants, marketers, processors, feed millers, poultry equipment manufacturers, feed ingredients marketers, transporters and a host of others.



**Fig.1: Conventional broiler production pen showing Employee in a poultry farm**



**Fig. 2:Chicken Processing and Processors**



**Fig.3: Feed milling**



**Fig.4: Feed and feed ingredients supply and transport services**



**Fig.5: Local Poultry Marketer**

### **1.2.6. Social Security and Livelihood Capitals**

Currently, Nigerian population is about 200 million and it keeps increasing by the day. Poultry has the potentials to provide cheap and reliable sources of animal protein like eggs and chicken to meet the animal protein needs of the ever increasing populace of the Nation as well as create jobs for different categories of people (both male and female) along the value chain. As demand for poultry products increase, production increases, more jobs are created and income lines increase through poultry production. Enough profits can be made from small stocks to allow for expansion. All these make poultry a veritable tool to enhance household security (social security), livelihood capitals and financial/physical asset and as well promote gender and social equity, therefore reducing the gap between the Rich and the Poor.

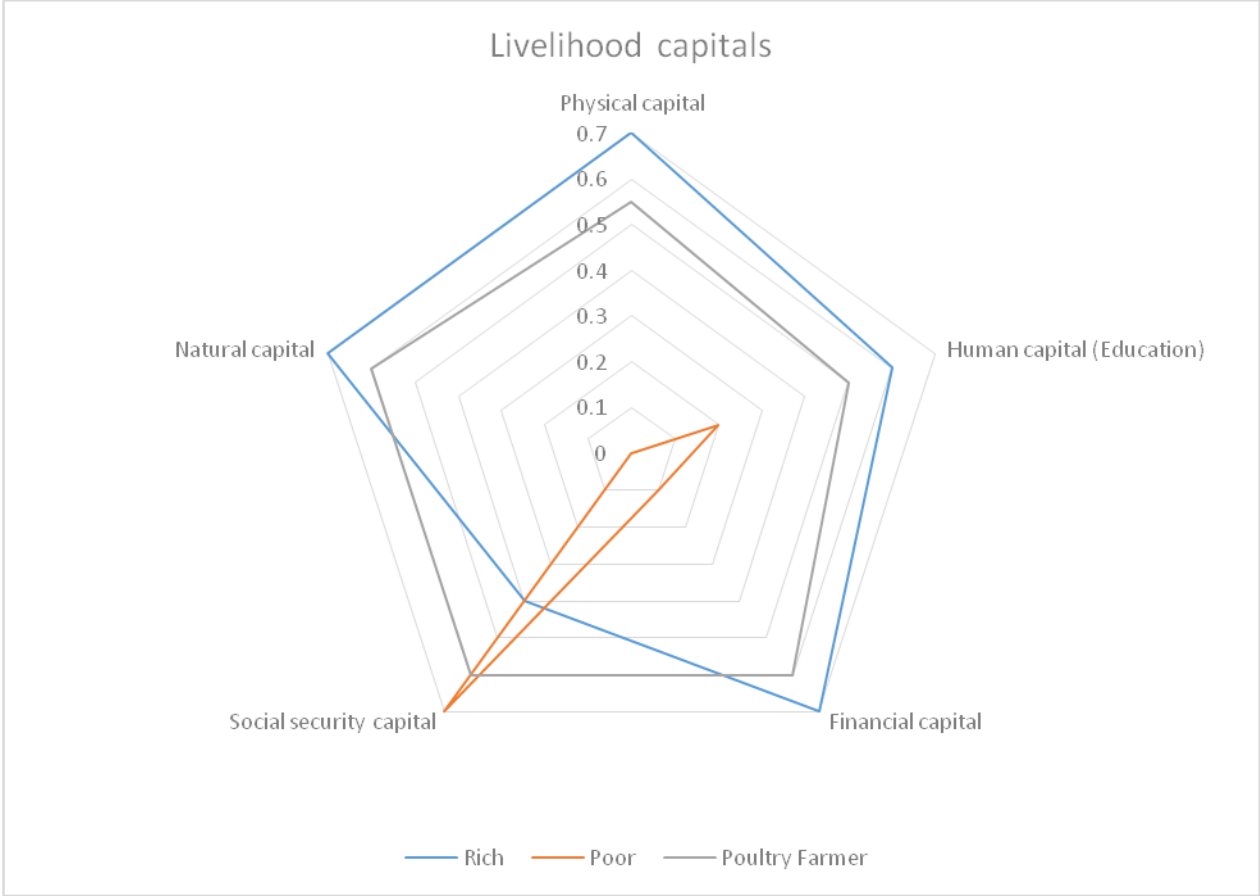
**Table 1: Nutrient Composition of the Meat of Poultry and Other selected Animal Species compared with Bread and Potatoes**

| Parameters           | Energy<br>(kJ) | Water<br>(%) | Crude          |            |            |            |            |           |            |            | A     | B1   | B2   | B6   | Nitric<br>Acid | Ca<br>Pantothenate |
|----------------------|----------------|--------------|----------------|------------|------------|------------|------------|-----------|------------|------------|-------|------|------|------|----------------|--------------------|
|                      |                |              | Protein<br>(%) | Fat<br>(%) | Ash<br>(%) | Ca<br>(mg) | Ph<br>(mg) | K<br>(mg) | Na<br>(mg) | Fe<br>(mg) |       |      |      |      |                |                    |
| <u>Beef</u>          |                |              |                |            |            |            |            |           |            |            |       |      |      |      |                |                    |
| Lean Meat            | 116            | 75           | 22.3           | 1.8        | 1.2        | 12         | 195        | 350       | 65         | 3          | 40    | 0.1  | 0.2  | 1.5  | 5              | 0.45               |
| Fatty Meat           | 323            | 54.7         | 16.5           | 28         | 0.8        | 8          | 145        | 350       | 65         | 2.5        | 90    | 0.06 | 0.15 | 1.5  | 4              | 0.45               |
| <u>Pork</u>          |                |              |                |            |            |            |            |           |            |            |       |      |      |      |                |                    |
| Lean Meat            | 112            | 75.1         | 22.8           | 1.2        | 1          | 10         | 195        | 350       | 70         | 2.5        | trace | 0.85 | 0.2  | 0.3  | 4.5            | 0.5                |
| Fatty Meat           | 472            | 41.1         | 11.2           | 47         | 0.6        | 9          | 170        | 350       | 70         | 2.2        | trace | 0.7  | 0.15 | 0.3  | 4              | 0.5                |
| Chicken              | 105            | 75           | 22.8           | 0.9        | 1.2        | 10         | 240        | 300       | 70         | 1.5        | 200   | 0.05 | 0.1  | 0.45 | 8              | 0.9                |
| Bread                | 239            | 38.5         | 6.4            | 1          |            |            |            |           |            |            |       |      |      |      |                |                    |
| Potatoes<br>(Cooked) | 72             | 78           | 1.9            | 0.1        |            |            |            |           |            |            |       |      |      |      |                |                    |



**Table 2: Composition of Poultry Manure With or Without Litter Materials**

| <b>Sources (kg/ton)</b>                      | <b>Total N</b> | <b>NH<sub>4</sub><sup>+</sup><br/>N</b> | <b>P<sub>2</sub>O<sub>5</sub></b> | <b>K<sub>2</sub>O</b> | <b>Ca</b> | <b>Mg</b> | <b>S</b> | <b>Na</b> | <b>Fe</b> | <b>Mn</b> | <b>B</b> | <b>Mo</b> | <b>Zn</b> | <b>Cu</b> |
|--|----------------|---|-----------------------------------|-----------------------|-----------|-----------|----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|
| Fresh Litter                                 | 55.000         | 22.000                                  | 37.400                            | 24.200                |           |           |          |           |           |           |          |           |           |           |
| Broiler House                                | 158.400        | 24.200                                  | 171.600                           | 99.000                | 90.200    | 17.600    | 33.000   | 28.600    | 2.860     | 1.474     | 0.119    | 0.002     | 1.386     | 0.990     |
| Rooster House                                | 160.600        | 26.400                                  | 165.000                           | 99.000                | 94.600    | 18.700    | 30.800   | 28.600    | 3.520     | 1.628     | 0.108    | 0.002     | 1.496     | 1.122     |
| Breeder House                                | 68.200         | 15.400                                  | 118.800                           | 68.200                | 206.800   | 14.960    | 18.700   | 18.700    | 2.860     | 1.254     | 0.077    | 0.001     | 1.144     | 0.462     |
| Stockpiled Litter                            | 79.200         | 17.600                                  | 176.000                           | 74.800                | 118.800   | 17.600    | 26.400   | 13.640    | 3.300     | 1.298     | 0.090    | 0.002     | 1.210     | 0.594     |
| <b>Layer House</b>                           |                |   |                                   |                       |           |           |          |           |           |           |          |           |           |           |
| Fresh (No litter)                            | 57.200         | 13.200                                  | 48.400                            | 24.200                |           |           |          |           |           |           |          |           |           |           |
| Under cage<br>(Scraped)                      | 61.600         | 30.800                                  | 68.200                            | 44.000                | 94.600    | 13.420    | 15.840   | 9.900     | 1.144     | 0.594     | 0.110    | 0.009     | 0.704     | 0.079     |
| High Stored<br>(kg/4546L)                    | 83.600         | 39.600                                  | 123.200                           | 66.000                | 189.200   | 13.200    | 19.360   | 11.000    | 3.960     | 1.144     | 0.106    | 0.001     | 0.814     | 0.009     |
| Liquid<br>slurry(kg/4546L)                   | 136.400        | 92.400                                  | 129.800                           | 81.400                | 77.000    | 14.960    | 18.040   | 11.660    | 6.380     | 0.924     | 0.088    | 0.040     |           |           |
| Anaerobic lagoon<br>sludge<br>ib/acre inch   | 57.200         | 17.600                                  | 202.400                           | 28.600                | 156.200   | 15.840    | 26.400   | 9.240     | 4.840     | 5.060     | 0.180    | 0.031     |           |           |
| Anaerobic lagoon<br>liquid (ib/acre<br>inch) | 176.000        | 154.000                                 | 45.000                            | 266.000               | 25.000    | 7.400     | 52.000   | 51.000    | 2.000     | 0.240     | 0.370    | 0.020     | 0.700     | 0.190     |



**Figure 1: Livelihood capitals as indicators of human and social security**  
**Source: Adiku, 2012**

### **1.3 Problems of Poultry Production**

1. Consumer market could be limited by poor purchasing power, poverty and low employment levels
2. Global conspiracy and competition with very fast developing economy (China, Brazil, India)
3. Climate change and erratic production plan for grains
4. Inadequate supply and high prices of inputs (especially feed) and the consequent high cost of production
5. Inadequate capital and/or credit finance, and high interest rate of commercial banks loans
6. Inadequate extension or advisory services to support developing farms
7. Outbreak of diseases
8. Poor breeder stock and Day Old Chicks (DOC)
9. Poor policy and political will for implementation of government intervention
10. Poor regulation of the poultry Industry
11. Poor production standard for export oriented market
12. Problem of central processing unit for adequate cluster formation
13. Problem of Land Tenure and delayed allocation of land for poultry farm Estate
14. Small holder keeping and associated problems
15. Weakened value of currencies compared with major world currencies (poor exchange rate)

## **MODULE 2 : TYPES OF POULTRY**

### **2.1 Introduction**

Poultry is categorized into two (the meat and egg types) based on their primary product(s). The meat type in Nigeria and developing countries context is further classified as heavy and medium meat type. Broiler is an example of heavy meat type while cockerel is the example of medium meat type.

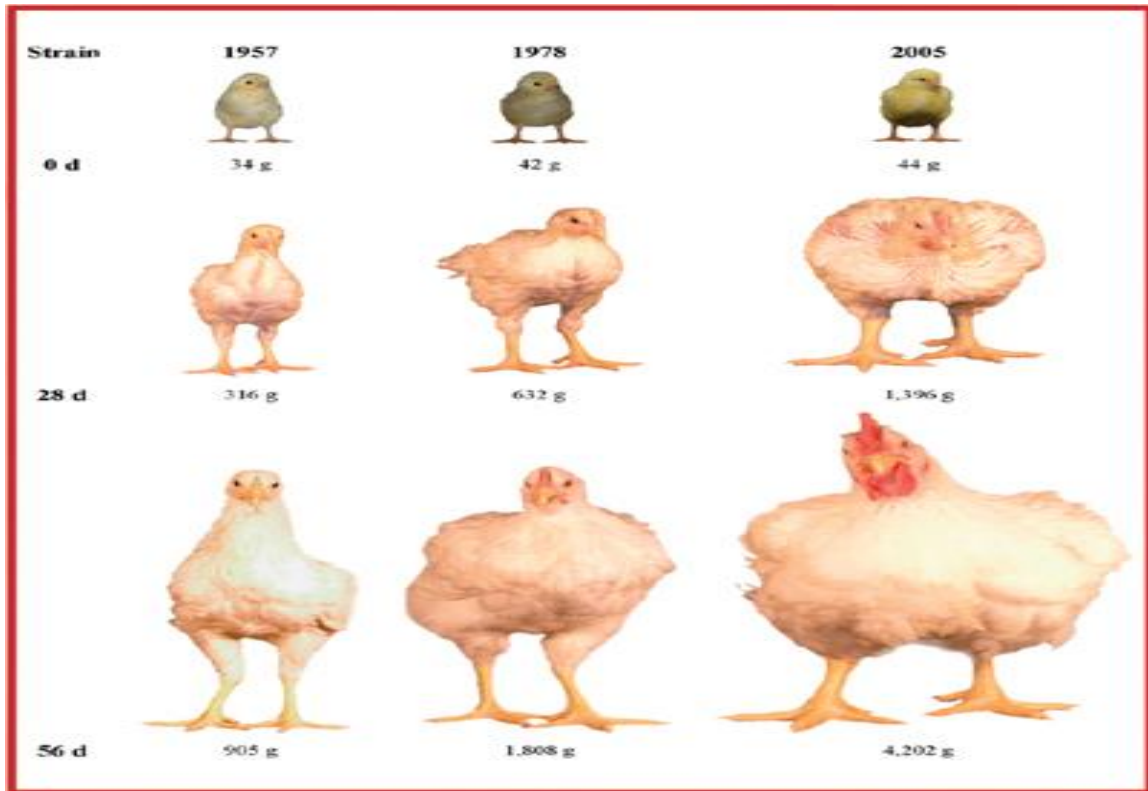
In developed climates, emphasis is usually on the broilers as the meat is usually soft and tender. Broiler could be chicken, turkey and duck. Therefore, it is not out of order to talk about broiler chicken, broiler turkey and broiler duck. Broilers irrespective of the type of poultry (chicken, turkey, and duck) refer to products of intensive selection over past decades for rapid growth and high feed efficiency as explained earlier above. Broiler chickens are marketed under different trade names.

### **2.2 Broiler Chicken Production : History, Types And Strains**

#### **2.2.1 History of Broiler Chickens Selection and Production**

Broiler chickens are meat type chicken that have been selected for very fast growth rate and high feed efficiency. Broiler production started in early 1920's in the USA as a result of observation of farmers and the increase in demand for meat birds. Farmers noticed that some birds were better suited for laying eggs while others were better producers of meat and therefore began to raise single purpose chickens (used for one reason). That is, either for egg or meat production rather than dual purpose chickens used for both egg and meat production and were just average in production.

Selection of birds created special opportunity for farmers. In 1940s, birds were selected using several factors, including growth rate, feed conversion efficiency and meat yield (the amount of meat on breasts and drumsticks). The intensive selection efforts for decades has resulted in today's fast growing birds that have the ability to reach market weight within 6 weeks with high meat yield. Consequently, today, we know about breeder strains such as Marshal, Ross and Anak within our immediate environment. In other climates, we hear about Peterson, Vantress, Cobb, Hubbard, Pilch and Arbor Acres. All these have become brand names and established market brands.



**Fig. 6: Improvement in Broiler Size over the years**  
Source: Watson and Davis (2015)

In spite of the achievements, efforts continue in the area of modern production strategies and needs for long-term sustainability of the industry without comprising:

- i. Animals health and welfare;
- ii. Human health and food safety;
- iii. Financial success of the customer; and
- iv. Friendly environment.

### 2.3 Broiler Chickens Production



**Fig. 7: Stages of Development**

Again, broilers chickens are selectively bred for meat. They have fast growth rate and attain market weight between 35 and 42 days. Broiler chickens are relished for their softy muscle and good taste. In

fact, they are common in fast food joints (Super Foods, Sweet Sensations, Tasty Fried Chicken, Mama Cass, Mr. Big, Chicken Republic etc.), standard restaurants, open markets (Kuto, Oyingbo, Sango, Lafenwa, Omida, Bodija and other Farm Gate outlets). They are common and found in standard shopping mall (ACE, ShopRite, Palm Shopping Mall etc.).

#### **2.4 Strains of Broiler Chickens**

Broiler chickens are predominantly the same in terms of growth rate, high meat yield and other genetic qualities. However, they are produced and marketed by different breeders or companies under different trade names such as Marshal, Abor Acre, Abor Acre Plus, Anak, Anak Titan, Hubbard, Cobb, Ross, etc. Broiler chickens regardless of the strain are produced basically using the same management techniques.



**Fig. 8 : Atypical Deep Litter system of Housing**

## MODULE 3 : MANAGEMENT OF BROILER CHICKENS

### 3.1 Introduction

Management of chicken refers to the entire husbandry practices/processes involved in raising birds from chick at a day old to the time of achieving the primary purpose of production or that help achieve and maximize production target and efficiency. Good management practices is important and it includes siting and housing construction, purchase of equipment and installations, purchase and stocking of birds, brooding, feed and feeding, water utilization, litter and health.

### 3.2. Site Selection, Housing and Equipment

In order to achieve good growth and optimal health of birds and profitable venture for the farmer some consideration must be given to site selection and housing. Broiler house (pen) should be sited on a well-drained soil. Waterlogged area should be avoided. The pen should not be sited very close to major road to prevent disturbances from traffic. It is essential to ensure that the land area is sufficient for establishment and possibly, expansion. Where possible, the farm could be sited in a relative cool but easily accessible area, not too far from sources of inputs and market outlet. The farm should be situated where there is regular supply of good water. Also, as much as possible, poultry pens should be some distance from human living areas.

The housing is a function of size of production (rearing) system, purpose and financial strength of the farmer. Deep litter housing type is most suitable for broiler production (see photos below) as it helps prevent leg problem. Housing should protect the birds from harsh environmental conditions and social vices. They are built to have East – West orientation (i.e. the length faces the North – South direction).



Fig. 8 :Backyard Deep Litter Housing



**Fig. 9: Simple Backyard Deep Litter Movable Pen at Salawu Comprehensive High School, Abeokuta**





**Fig.10 : Commercial Deep Litter Housing**

Similarly, equipment for poultry production are of different types. They are necessary for successful poultry farming. They include heaters, feeders and drinkers among others (as indicated in the photo below).



**Fig.11: Simple Poultry Equipment**

In industrialized commercial broiler production, tunnel system is used. This system uses more sophisticated equipment such as automatic feeder, drinker, fogger, humidifier, brooding equipment among others.



**Fig. 12 : Industrial Deep Litter Housing Type for Broiler Production (Tunnel system)**

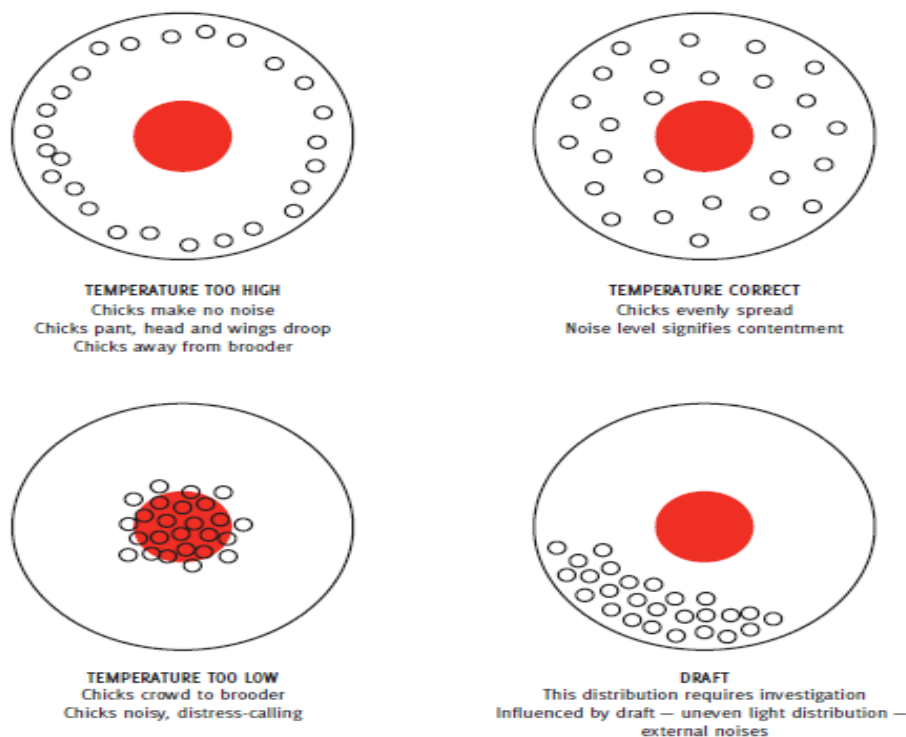
### **3.3 Brooding Management and Illustrations**

The poultry house and all equipment should be thoroughly cleaned and washed to rid them of all visible dirt and disinfected and dried a few days before arrival of birds. The floor should be covered with dried litter material, preferably wood shaven to a depth of about 5cm while the brooding area should be well covered to prevent drought and escape of heat.

Adequate warmth in the first 10-14days is very critical and important in the life of chicks. This therefore, emphasizes the need to provide additional heat for maintenance and rapid growth and development. The chicks at day old have just been hatched from the eggs and do not have enough feather cover to conserve body heat and fluid. Hence, they need gentle acclimatization in their new environment. Delays in placement into a conducive new environment (brooding area) can lead to dehydration of chicks, resulting in early chick mortality and reduced growth rate. Chicks must be carefully placed and evenly distributed near feed and water throughout the brooding area. The farmer is required to start the heating system at least 2 hours before chicks are stocked and to ensure that all equipment are in good working condition.

Farmer should also monitor the chicks' behavior and distribution relative to the heat supply. The brooding temperature is good if the shank is warm. Where thermometer is available, 33°C is recommended. The temperature can thereafter be reduced by 2°C every 3 days and depending on the season. Under very good

brooding, temperature could be reduced to 27°C by the 14<sup>th</sup> day. It is important to note that the behaviour of the birds could be used as indicator of suitability of brooding temperature as illustrated below. Under correct brooding temperature, the birds will be evenly distributed within the brooding area.



**Fig.13: Reactions of Chicks to Temperature in Brooding Management**

### 3.4 Feeds and Feeding Management in Broiler Chickens Production

Feeds for Broiler chickens, other poultry or livestock refers to materials which when ingested provide the animal with basic nutrients such as energy, protein, vitamin and mineral. Feeds vary in terms of quality or quantity of the nutrient supplied. Feed type depends on the class and/or physiological stage of the bird. Starter feed for instance refers to feed given to broiler chickens between 0-4 weeks of age, while finisher feed refers to feed given between 4-8 weeks.

Feed cost is the largest single item in broiler chicken production in particular and poultry as well as other livestock in general. It accounts for 65 to 75% of the total production cost. For a profitable broiler production, the conversion of feed to meat must be done efficiently and economically. Adequate nutrition and balanced diet is essential. Crude protein requirement for starting broiler is 22-23%, crude fibre is 4-5%, fat is 4-4.5% and the metabolizable energy is 2800-3000kcal/kg. Similarly, crude protein requirement for finishing broiler is 19 - 20%, crude fibre 5 – 6.5% and the metabolizable energy is 3000-3150kcal/kg (Table 3).

When chickens are provided with high quality feed in the required quantity, it promotes body maintenance, improves production (growth and body weight), and it gives energy and confers good health and vitality. Maintenance of the body is the first consideration in good feeding and production follows thereafter.

Two (2) feeding regimes: starter (0-4 weeks) and finisher (4-8 weeks) diets for broiler production and management are considered suitable for most farmers. However, it is important to note that there are up to four feeding regimes for broiler production. They are pre-starter, starter, grower

and finisher. The feeding regime utilized is a function of the production targets (very fast growth for quick market or slow growth for later market).

**Table 3: Feed Guide for Broiler and Cockerel**

| <b>Bird Type</b> | <b>Age (weeks)</b> | <b>Feed type</b> | <b>Crude (%)</b> | <b>Protein</b> | <b>Metabolizable Energy (KJ/kg)</b> |
|------------------|--------------------|------------------|------------------|----------------|-------------------------------------|
| <u>Broiler</u>   |                    |                  |                  |                |                                     |
| Starter          | 0-4                | Broiler Starter  | 22-23            |                | 2800-3000                           |
| Finisher         | 4-8                | Broiler Finisher | 19-20            |                | 3000-3150                           |
| <u>Cockerel</u>  |                    |                  |                  |                |                                     |
| Chick            | 0-8                | Chick Mash       | 20               |                | 2800                                |
| Grower           | 8->20              | Grower Mash      | 17-18            |                | 2750-2800                           |

### 3.5 Water Management

Water is very essential in broiler chicken production. Birds drink more than the feed they consume therefore, water should be provided in good quantity and must be of good quality. Well or bore hole water is preferred and where it is not available, rain or tap water could be used. Clean, fresh water should be presented so that birds can drink with minimum effort. Water and the source should be checked for quality on a regular basis and treated as required. Bird should be provided water at least thrice the quantity of feed they consume.

### 3.6 Tips in achieving a high Feed Efficiency in Broiler Chicken Production

1. Adequate feeding space should be provided at all times, ensuring that about 75% of the birds can feed at the same time.
2. Feeders should be well designed to prevent feed wastage
3. Feeders should be filled to not more than ½ full capacity.
4. Feeders should be placed at the appropriate ground level or be properly hung as the case may be to avoid feed contamination and wastage.
5. Attendants should minimize feed spillage during the process of serving feed.
6. Use the right type and size of feeder per stage to ensure that birds have good access to consume the feed without straining.

**Table 4: Feeding Guide for Broiler Chickens**

| Age (Days) | Feed intake (g/bird/day) | Body weight(g/bird) |
|------------|--------------------------|---------------------|
| 1          | 20                       | 45-55               |
| 2          | 22                       | 55-95               |
| 3          | 24                       | 95-135              |
| 4          | 26                       | 135-175             |
| 5          | 28                       | 175-215             |
| 6          | 30                       | 215-255             |
| 7          | 32                       | 255-295             |
| 8          | 34                       | 295-335             |
| 9          | 36                       | 335-385             |
| 10         | 38                       | 385-425             |
| 11         | 40                       | 425-465             |
| 12         | 42                       | 465-505             |
| 13         | 44                       | 505-545             |
| 14         | 46                       | 545-585             |
| 15         | 48                       | 585-625             |
| 16         | 50                       | 625-665             |
| 17         | 52                       | 665-705             |
| 18         | 54                       | 705-745             |
| 19         | 54                       | 745-785             |
| 20         | 56                       | 785-825             |
| 21         | 58                       | 825-865             |
| 22         | 60                       | 865-905             |
| 23         | 62                       | 905-945             |
| 24         | 64                       | 945-985             |
| 25         | 66                       | 985-1,025           |
| 26         | 68                       | 1,025-1,045         |

7. Do not store feeds for too long or in damp places, otherwise they become moldy and create problem when fed to birds.
8. Use correct stocking density (0.07m<sup>2</sup> at starter phase; 0.09 – 0.1m<sup>2</sup> at finisher phase)
9. Ensure good lighting programme; provide lighting for 6 – 8 hour in the Pen.
10. Change the litter regularly. Do not allow caked litter in the pen.

**Note:**

If there is any need to change from one type of feed to another, it should be done gradually for a period of about four days.

**3.7 Litter Management**

Broilers are often reared in deep litter system. Wood shavings are the preferred bedding materials. Alternatively, maize cobs and straws could be used. Wood shavings should be laid to about 5cm height and must be cleaned up regularly, at least once a week. Poor litter management results in microbial and ammonia build-up and can lead to diseases like coccidiosis and respiratory infections. Litter management is paramount and important for good health.

## MODULE 4: HEALTH MANAGEMENT IN BROILER CHICKEN

### 4.1 Introduction

Health is wealth. The health of birds must be well managed for better profit. Prevent disease occurrence because prevention is better than cure. Good health management and disease prevention starts with construction, preparation of the pen; cleaning, washing and disinfection of the pen and equipment; good chicks, appropriate litter management and bio-security. It also involves giving appropriate medications and vaccines as recommended by the Veterinary Doctor or manufacturer/service provider. However, sample medication and vaccination programme is shown in Table 5.

### 4.2 Medication and Vaccination

**Table 5: Medication and Vaccination Prototype for Broiler Chickens**

| Age (Day) | Vaccine   | Mode of Administration | Comment/Remark  |
|-----------|---|------------------------|---|
| 1         | Intra ocular (i/o)  | through the eye        | The eye is well developed at Day old  |
| 1-5       | Multivitamin + Antibiotics                                      | Oral                   | Good anti-stress  |
| 10        | Infectious Bursal Disease (IBD) – Gumboro                       | oral                   | Reconstituted in chlorine free water. Birds must be starved of water for about 6hours so that the vaccines could be taken and finished within a period not more than 30 minutes                 |
| 13-16     | Coccidiostat  | Oral                   | For 4 days initially  |
| 17        | New Castle Disease Vaccine Lasota (NDV – Lasota)                | Oral                   | As indicated in day10 Vaccination remarks   |
| 19-21     | Coccidiostat  | Oral                   | For 3 days. Repeat as in 13-16 and 19-21 days order fortnightly till the birds reach mark weight. However, this can be avoided if the litters are changed weekly and dry bedding is maintained. |
| 27        | IBD – Gumboro 2nd (booster) dose                                | Oral                   | As indicated in day10 Vaccination remarks   |
| 35        | New Castle Disease Vaccine Lasota (NDV – Lasota) – booster dose | Oral                   | As indicated in day10 Vaccination remarks   |
| 42        | Dewormer  | Oral                   | For one or two days depending on type. Please find out from the Veterinary Doctor. Repeat after 2weeks.   |

### 4.3 Rules of Thumb For Effective Vaccination

There are basic rules that guide vaccination process. These include the rules on the vaccine, bird and vaccinator (the person).

#### Vaccine

- Appropriate vaccine should be used for appropriate disease type
- Use vaccine(s) that are locally produced where it is available
- Use correct and equal dose for correct and equal number of birds (right dose)

#### Bird

- Do not vaccinate sick birds
- Sick birds that could not be vaccinated should be culled

- Treat secondary disease infection before vaccination

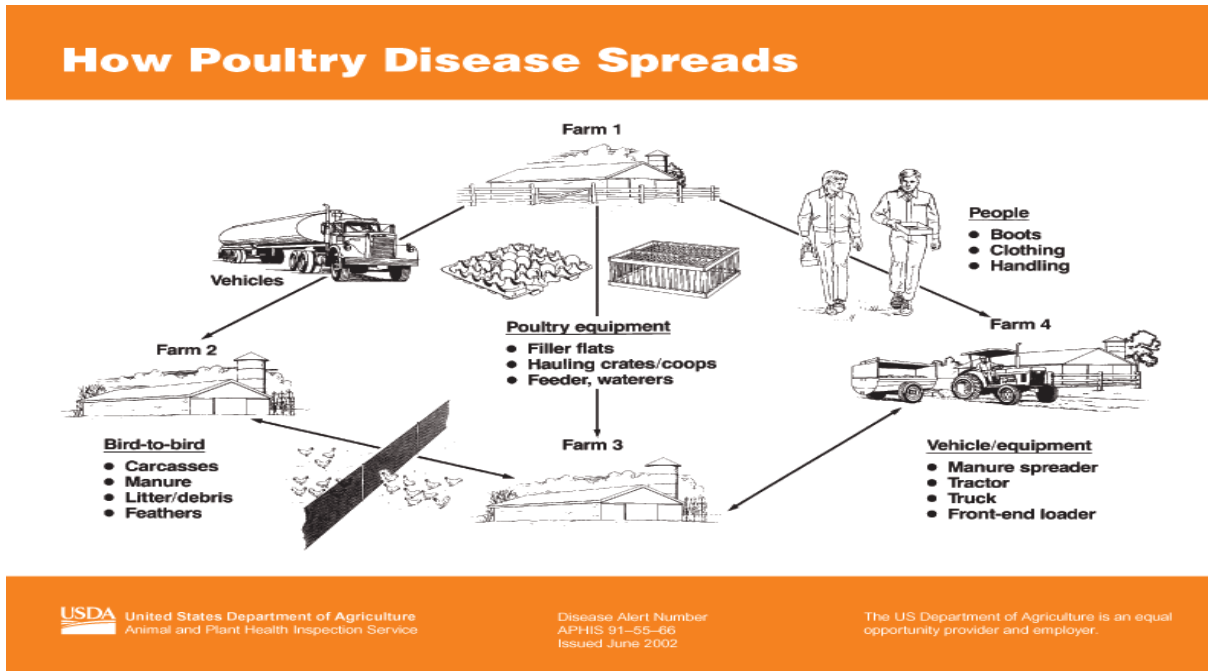
**Vaccinator**

- Use chlorine free water (where it is available) for oral administration otherwise add skimmed (powdered) milk to the water
- Maintain the cold chain from point of purchase of vaccine till use
- Once the vaccine has been reconstituted, there should not be delay in time with use. reconstituted vaccines must be utilized within 30 minutes
- Birds should be administered with anti-stress 1-2day before vaccination and 2days after vaccination with effect from the very moment the flock is vaccinated.
- The vial of used vaccines must be appropriately disposed.

**4.4 Bio- Security Issues in Broiler Production**

Poultry farm is an integral parts of so many interactions and components. The components are the people/staff, materials, birds, environment, and other extraneous substances outside the immediate environment such as inputs suppliers, products markets and vehicles among others. All the components have to be well managed through bio-security measures. Therefore, bio-security/quarantine is an integral part of health management in any successful broiler production system and very essential in poultry production.

It refers to those measures taken to prevent or control introduction and spread of infectious agents to a flock. Diseases, whether proven or not significantly reduce the productivity of birds, and the profitability and long term financial viability of a broiler business. Biosecurity helps to prevent disease causing organisms from establishing themselves on farm site, prevent the spread of disease agents from an infected area to an uninfected area and prevent the spread of infection within the farm.



**Fig. 12: Avenues of Poultry Diseases spread and Bio-Security**

**4.4.1 Objectives of Bio-security**

- To prevent introduction of infectious diseases to livestock.
- To prevent the spread of disease from an infected area to an uninfected area

- (c) To prevent disease spread from one farm to another
- (d) To safe guard the health of the livestock
- (e) To enhance profitability of the Food Animal business

#### **4.4.2 Components of Livestock Farms that contribute to Diseases Spread/Transmission**

- Livestock
- Other animals
- People
- Equipment
- Vehicles
- Air
- Water Supply

##### **Livestock**

- Transfer of birds from farm to farm
- Dead bird disposal

##### **Other Animals**

- Wild birds/ducks
- Feral and domestic animals and pets
- Insects
- Rodents – rats/mice
- Domestic birds

##### **People**

- Contractors, maintenance personnel, neighbours, servicemen, friends
- Disease can be transmitted by, for example, hands, boots, clothing, and dirty hair

##### **Equipment**

- Feeders
- Waterers
- Hauling crates/coops

##### **Vehicles**

- Up and off-loading (roundabout/utility) vehicles come onto the farm with microbe loads
- Tyres of the vehicles are microbes loaded
- Low cleanliness of the Farm vehicles
- Poor regular disinfection of Farm vehicles

##### **Air**

- Transmission as an aerosol or dust

##### **Water Supply**

- Surface water attracts waterfowl, birds ingest contaminated water



#### 4.5 Important Considerations for Bio-Security and Success Tips

Location, layout of farm, disease status of the district, proximity to other farms with avian species and interface with the processor are some of the various inter play in farm localization and disease management and control. Others include pick-ups, serviceman, day-old chicks and feed deliveries.

#### 4.6 Tips for Successful Bio-Security

##### 4.6.1 Farm Layout

Farm Layout is an important consideration in poultry business. It helps for plan and movement of activities, loading and off-loading of products, farm administration and operations and more importantly, structural and operation bio-security for disease management and control.

Therefore, the entire farm must be well planned (good farm layout) to reduce stress on handlers and birds. And the pens would be constructed with good orientation (East-West).



**Fig.13 :Approach of a Typical Poultry: Farm Layout**

Provision for structural bio-security is made with restriction gate



**Fig. 14: Internal Plan of a Typical Poultry Farm**

Growing Pens are independent with 15m distance maintained between Pens



**Fig. 15: Foot Dip place at the entrance of Broiler Pen.**

It is important that any person given the approval to enter the pen must dip his/her feet in the foot bath (dip) containing disinfectant. Some farms also have tyre bath through which any vehicle entering into the farm passes through. All are efforts to reduce micro-organism load into the pen and prevent disease transmission.

**Table 6 :Bio- Security Score Card**

**Yes No**

| <b>A. Distance between farm and potential disease transmission Threats</b> |  |  |  |
|--|--|--|--|
| 1  | The next poultry farm is 1.5km or more away as the crow flies.   |  |  |
| 2  | The processing plant is a 1.5km or more away as the crow flies.  |  |  |
| 3  | The main route by which trucks travel to the processing plant is a 1.5km or more away as the crow flies.   |  |  |
| 4  | My farm is more than a kilometer from a standing body of water (pond, lake) as the crow flies.   |  |  |
| 5  | The nearest rendering facility is a kilometer or more away as the crow flies   |  |  |
| <b>B. Movement Restrictions</b>  |  |  |  |
| 6  | I do not take farm vehicles off the farm   |  |  |
| 7  | I do not lend or borrow equipment from other poultry operators.  |  |  |
| 8  | I have a gate that restricts vehicle access to the poultry houses.   |  |  |
| 9  | My poultry houses are surrounded by a fence.   |  |  |
| 10   | All visitors to the farm must sign a log book.   |  |  |
| 11   | I permit no visitors on the premises except authorized personnel that is, people who need to be there.   |  |  |
| 12   | I check vehicles coming onto the farm to see if they are clean.  |  |  |
| 13   | I ask and ensure vehicle operators have disinfected their tires prior to coming on the farm.   |  |  |
| 14   | I ask visitors where they have been prior to coming on the farm  |  |  |
| 15   | My poultry houses are locked to discourage unauthorized entry.   |  |  |
| 16   | I have erected signs indicating that access is restricted.   |  |  |
| 17   | No one except me, my employees, service personnel, and veterinarians are permitted in my poultry houses prior to load-out.                                 |  |  |
| 18   | Load-out crews are not permitted to go anywhere else on the farm except for houses they are assigned to work in.   |  |  |
| 19   | I never visit other poultry farms.   |  |  |
| 20   | I never visit the live-side of the processing plant.   |  |  |
| 21   | Feed truck drivers are not permitted to enter poultry houses.  |  |  |
| 22   | I have a box for feed tickets on the feed bin so that the driver doesn't have to enter the house.  |  |  |
| 23   | Fuel truck drivers are not permitted to enter the poultry houses.  |  |  |
| <b>C. Flock Management</b>   |  |  |  |
| 24   | I only have one age of birds on the farm during a given production cycle.  |  |  |
| 25   | When there are multiple ages of birds on the farm, the order of care is youngest to oldest.  |  |  |
| 26   | I have different employees caring for different ages.  |  |  |
| <b>D. Rodents and Migrating Birds Control</b>                              |  |  |  |
| 27   | I have a rodent control plan.  |  |  |
| 28   | I regularly check bait boxes and traps to be sure that the bait is fresh and to remove dead rodents.   |  |  |
| 29   | I regularly check for rodent activity e.g., active holes near the foundations, chewed curtains and insulation, rodent droppings on sills and in ante-rooms |  |  |
| 30   | I do not let trash and junk pile up in my ante-room.   |  |  |

## MODULE 5 : PRODUCTS AND MARKETING

### 5.1 Introduction

Poultry production targets basically two primary poultry products (Meat and egg). With modern production system, many other products could be derived and are referred to as secondary or derived products. These include manure, feather, slaughter house waste, empty sacks where commercial feeds are used among others. These products collectively and individually generate basic or additional income to the farmer depending on production targets.

For example, broilers are reared purposely for their meat. They are sold in live bird markets and other channels or to other processing units and various consumers in various forms and sizes such as dressed, cut parts and organs e.g. gizzard. Where additional techniques are employed manure, feather, and slaughter house waste amongst others are converted into organic fertilizer for crop production.



Fig. 16a:Dressed Chicken



Fig. 16b:Decayed Manure



Fig. 16c:Manure bagged for sale

Fig.16d: Broiler Chickens and Products



Fig. 16e: Live birds



Fig. 16 f : Whole Chicken

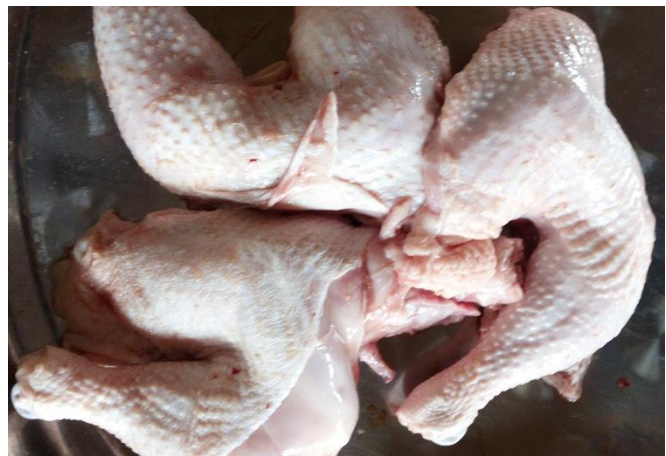


Fig. 16g :Choice Cut part (thigh + drum stick – Cut 4)



**Fig 16 h : Broiler primitive cuts (shanks, head)**

### **Broiler Products and Marketing**

Broiler chickens may be sold whole or retailed in choice cuts. Some customers prefer tender meat, some prefer cured meat. Customer taste (market targeted) is important when producing broiler and the market should be satisfied. For example, most restaurant want soft meat and small cuts e.g. cut-4 while open market may want whole chicken or cut parts but not so soft. Some customers prefer the wings, shanks, head and neck. All the customers should be well catered for.



**Fig. 17 :A Typical Broiler Market**



**Fig. 18 : Sales Opportunity in a typical Local Market**



**Fig. 19 : Broiler chicken slaughtering and processing**



**Fig. 20 : Broiler Chicken slaughtering and processing in a Local Market**

## MODULE 6:RECORDS KEEPING IN POULTRYPRODUCTION AND MANAGEMENT

### 6.1 Records Keeping and Good Observations

It is very important that adequate records of activities are kept. This helps to identify problem areas. Records also help to measure performance. In big farms, records could be used to seek for funds from Banks. Records of feed intake, growth, mortality and overall performance should be adequately kept. Example of production and performance record/chart is given below.

### 6.2 Examples of Records Kept in Poultry Farms

#### GOFRAVAS FARM, OSIELE, ABEOKUTA, OGUN STATE PRODUCTION RECORD CHART

Bird Type .....

Strain .....

Hatchery .....

Date of Stocking .....

| Date | Day | Opening Stock | Mortality | Stock Balance | Qty. of Feed (kg) | Medication (drug use and mode) | Vaccination (type and mode) | Remarks |
|------|-----|---------------|-----------|---------------|-------------------|--------------------------------|-----------------------------|---------|
|      | 1   |               |           |               |                   |                                |                             |         |
|      | 2   |               |           |               |                   |                                |                             |         |
|      | 3   |               |           |               |                   |                                |                             |         |
|      | 4   |               |           |               |                   |                                |                             |         |
|      | .   |               |           |               |                   |                                |                             |         |
|      | .   |               |           |               |                   |                                |                             |         |
|      | .   |               |           |               |                   |                                |                             |         |
|      | 30  |               |           |               |                   |                                |                             |         |
|      | 31  |               |           |               |                   |                                |                             |         |
|      | 32  |               |           |               |                   |                                |                             |         |





**TOPMOST FARM, OBALENDE, OSUN STATE  
STOCK PERFORMANCE RECORDS**

Bird Type .....

Strain .....

Source .....

Date of Stocking .....

| Date | Day | Opening Stock | Blnce. | Qty of Feed (kg) | Medication/ Vaccination | Cost of medication/Vaccination (₦) | Remarks |
|------|-----|---------------|--------|------------------|-------------------------|------------------------------------|---------|
|      | 1   |               |        |                  |                         |                                    |         |
|      | 2   |               |        |                  |                         |                                    |         |
|      | 3   |               |        |                  |                         |                                    |         |
|      | 4   |               |        |                  |                         |                                    |         |
|      | 5   |               |        |                  |                         |                                    |         |
|      | 6   |               |        |                  |                         |                                    |         |
|      | .   |               |        |                  |                         |                                    |         |
|      | .   |               |        |                  |                         |                                    |         |
|      | .   |               |        |                  |                         |                                    |         |
|      | .   |               |        |                  |                         |                                    |         |
|      | .   |               |        |                  |                         |                                    |         |
|      | .   |               |        |                  |                         |                                    |         |
|      | 42  |               |        |                  |                         |                                    |         |
|      | 43  |               |        |                  |                         |                                    |         |
|      | 44  |               |        |                  |                         |                                    |         |
|      | 45  |               |        |                  |                         |                                    |         |



### **6.3 Avoiding Pitfalls in Poultry Production**

1. Maintain good distance between farms and other structures. Distance between farm and potential disease transmission treats should not be less than 1.5km
2. Engage in bio-security measures – restrict movement in and out of the poultry
3. Flock Management – Maintain one age of birds on the farm during a given production cycle; practice all in, all out
4. Control rodents and migrating birds in and out of the pen
5. Do thorough cleaning as appropriate
6. Sick birds should be isolated while dead ones should be burnt or buried in deep pit (or incinerator)
7. Obtain stocks from reputable hatcheries/farms

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