

**AN ECONOMIC ANALYSIS OF BROILER PRODUCTION IN  
THREE STATES OF NIGERIA**

**BY**

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A thesis submitted to the Postgraduate School, Ahmadu Bello University in partial fulfillment of the requirements for the award of the degree of Master of Science (M.Sc.) in Agricultural Economics.

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## DECLARATION

I hereby declare that this thesis was written by me and that it is a record of my research work. It has not been presented in any previous application for a higher degree. References made to published and unpublished literature have been duly acknowledged.



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27-05-1998

Date

The above declaration is confirmed by:



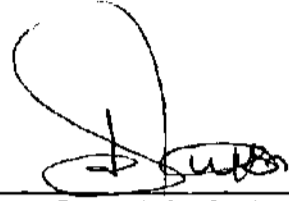
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**CERTIFICATION**

This thesis entitled "AN ECONOMIC ANALYSIS OF BROILER PRODUCTION IN THREE STATES OF NIGERIA" by Lawal Zakariya'u meets the regulations governing the award of the degree Master of Science (Agricultural Economics) of Ahmadu Bello University Zaria, Nigeria, and is approved for its contribution to scientific knowledge and literary presentation.



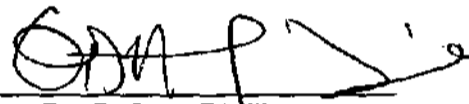
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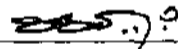
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## DEDICATION

This work is dedicated to my father, Late Alhaji Lawal Shargalle, Brothers Late Aminu Lawal Shargalle, and Late Lt. Mukhtar Lawal Shargalle.

## ACKNOWLEDGEMENT

All thanks be to Allah, the most gracious, the most merciful for granting me the opportunity, patience and courage to undertake this project.

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To my children, Abubakar, Abdullahi, Halimatu Sa'adiyya, Fatimah, Ibrahim and Asiya, I sincerely appreciate the sufferings my period of long absence may have caused them. May Allah bless them.

Last, but not the least, is my mother Malama Halima Ta-Dutsi whose constant prayers have made my endeavours a success. May Allah forgive her and bless her, here and hereafter.

## ABSTRACT

Nigeria is a country in dire need of a quick animal protein source to meet up with the demand of its ever increasing population. Development of poultry industry has been identified as one of the quickest means of bridging this deficiency gap. The development of this industry has, however, been hindered by many problems and the broiler enterprise has been found to be the worst affected. The biggest problem associated with broiler enterprise is the high cost of inputs used in the production process. This results in low profit to the producer and the high cost price to the consumer resulting in very low demand for the product. As such, determinants of costs and returns together with efficiency measures of financial success for the broiler enterprise are analysed in this study.

A total of 40 poultry farms were visited out of which 19 farms that produced broilers were considered for the study. The low size of 19 broiler farms indicate that majority of poultry farms are concentrating on layer production, and this also had an implication on the analytical framework used to achieve the objectives of the study. Descriptive, quantitative statistics, and net farm income analysis were used in the analyses and the following major conclusions were made: (a) the net farm income which is the central measure of overall financial success of a farm was found to be positive in most of the farms and increased with the scale of production; (b) the returns to factors of production (labour and management) are lower in small farms when compared to large farms. Return on capital for the various farms was not found to differ significantly but was seen to be related to efficiency of management. The average return on capital in the study area is about 45% which is higher than the current bank lending rate of 21%; (c) the gross ratio

which measures the ultimate solvency of farms was found to be about 0.60 for the broiler farms and does not differ significantly between small and large farms at lower level of production; (d) the operating ratio which shows the proportion of gross income that goes to pay for the operating costs is about 0.72, i.e. 72 percent, which is quite high. There is also no significant difference between known classes of farms which is due to the fact that all producers obtained inputs from a common market; (e) the fixed ratio which measures the proportion of gross income that goes to service fixed resources is under 5 percent in all the farms. This indicates the rudimentary stage of poultry industry with little fixed costs components.

Based on these results, it can be concluded that broiler production, despite the current decline, is still a profitable venture. What is needed is to devise ways and means of improving the efficiency of the production system to enable the producer realise more income and profit from his investment to offset the current high inflationary trend being experienced in the country.

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## CHAPTER ONE

### INTRODUCTION

Protein is an important organic compound utilised by the body for the replacement of broken-down body cells and tissues and is important for the maintenance of the general body metabolism. Despite, this fundamental role played by protein in the human body, many scientist have repeatedly called attention to a serious imbalance between protein supplies and human requirements in Nigeria (Oyenuga, 1968 and Idusogie 1972). This problem is depicted in Table 1.1.

Table 1.1: Population and protein supplies in relation to requirements of animal protein in Nigeria (from 1970 to 1990).

Variable Specification	Year			
	1970	1980	1985	1990
a. Human Population in million	67	86.6	99.5	115.6
b. Total daily animal protein supply (kg)	569,500	166,000	1,195,200	1,664,640
c. Per capita animal protein supply (d/day)	8.5	10.0	12.0	14.4
d. Per capita minimum animal requirement (g/day)	24.0	24.0	24.0	24.0
e. Total daily animal protein requirement (kg) <sup>1</sup>	1,608,500	2,078,400	1,195,200	1,109,760
f. Daily animal protein shortage (kg) <sup>2</sup>	1,039,000	1,912,400	1,195,200	1,109,760
g. Per capita daily animal protein shortage (g) <sup>3</sup>	15.5	14	12	9.6
h. Shortage as % of supply <sup>4</sup>	18.2	140	100	66.7

1. This is obtained by multiplying item (a x d)

2. This is obtained by subtracting (b-e)

3. This is obtained by subtracting (d - c)

4. This is obtained by dividing (d / C x 100)

Source: Nigerian Society for Animal Production (NASP), Ibadan, Olubajo (1976).

The Table shows that the animal protein supply is far less than the projected requirement between the years 1970 and 1990. However, the daily per

capita shortage decreases from 15.5g in 1970 to 9.6g by 1990. It shows an improvement in the animal protein supply though still inadequate.

The Table has clearly shown that, the rate of growth in animal protein supply has failed to keep pace with the rate of population growth. This inadequacy of protein in the diet has resulted in high incidence of infant mortality from kwashiorkor diseases in Nigeria's children (Idusogie, 1972).

Agriculturists and nutritionist have however unanimously agreed that developing poultry would be the fastest means of bridging this protein deficiency gap in the country. It was found that, as early as 1968/69 poultry products contributed about 0.4% of the total protein intake on per capita basis (Abaelu *et al.*, 1981). Similarly, Winrock International Institute for Agricultural Development (1992), showed that in terms of poultry product in Africa, Nigeria rates the highest. She has a total population of 190 million "Chickens". Nigeria is distantly followed by Ethiopia, Tanzania, Sudan, Kenya, Benin and Mozambique with 57, 30, 29, 23, 23 and 19 million respectively. However, in term of livestock share in agricultural production, Nigeria's figure is the lowest with only 18 percent, while these countries showed figures of; 40, 23, 58, 38, 21, and 20 respectively. This means that crop production (cereal, tubers, grains, legumes etc.) accounts for the remaining 82 percent of agricultural production in Nigeria.

### **1.1 Poultry Industry in Nigeria**

Commercial poultry production began in Nigeria in the early 60's. Halbrook (1962), reported that there were about 30 million chickens as that time of the report with no commercial poultry farms but only two government poultry

units at Riyom and Mando Roads. Small indigenous birds were crossed with larger imported breeds in the Southern part of the country. The poultry industry started earlier especially when the then Regional Governments introduced the farm settlement schemes which educated farmers on agriculture. The reports described the Eastern Region's Poultry Programme as the best in the 60's. It was complete in every respect with both plans and action on providing a supply of chickens, making feeds available, arranging vaccinations, training and follow up field services on extension and marketing (Halbrook, 1962).

The development of poultry as a business had been described by many as more promising than any other livestock business for Nigeria. Halbrook (1962), was of the view that poultry development programmes will pay more for the country than any other animal production programme and there is a great potential for it. Poultry are among the most adequate domesticated animals and there are only few places on the globe where climatic conditions make the keeping of a poultry flock impossible (Thaman, 1968). Poultry products are acceptable to all races. Stadelman (1977) described eggs as one of the few foods that are used throughout the world and that it has been an important part of the human diet since the date of recorded history.

Broiler meat is also generally accepted and rapidly consumed by practically every national and religious groups in Nigeria (Okon, 1983). In many Countries, the per capita consumption of poultry meat has expanded directly in proportion to the increase in the availability of poultry meat at an affordable price (FAO, 1966).

## 1.2 Problem Statement and Justification for the Study

Despite the fact that Nigeria has the highest poultry population in Africa, the trend for poultry production is on the decline. This is supported by the indices of the sectorial activities shown in Table 2.1.

Table 2.1: Estimated output of major agricultural commodities (livestock) ('000 tonnes except otherwise stated).

Commodities	1986	1987	1988	Percentage Change between	
	1	2	3	(1) & (2)	(2) & (3)
<b>LIVESTOCK</b>					
Poultry (Broiler Meat)	67	56	54	-16.4	3.6
Table eggs	399	332	269	-16.8	21.6
Goat Meat	192	206	209	-5.1	1.4
Lamb Mutton	68	75	81	-10.2	8.0
Beef	223	232	268	-4.0	12.1
Milk	180	182	188	-1.1	3.4
Pork	33	34	39	-3.0	14.7

Source: Derived from Federal Office of Statistics (FOS) Food and Agric Organisation (FAO). Production Year Book, Central Bank Annual Agric Survey. Annual Reports of Federal Ministry Of Agriculture and Water Resources from State Ministry of Agriculture and Natural Resources.

The explanation for the decline could be attributed to a number of factors which include high feed costs, unavailability of good quality vaccines to prevent disease outbreaks and the high costs of drugs to control the diseases where an outbreak had occurred. Others are lack of skilled labour and management in the industry; it is highly costly when available and hence cause over-reliance on family labour which is unskilled and inadequate. Similarly the declining value of the Naira poses threat to the industry. This is because the broilers industry relies on some set of captive technology embodied in the housing, nutritional, drugs and processing materials which have to be imported. The decline in the value of

the Naira affects the purchase price of these raw materials. Capital is also not easily accessible to the producers because the lending institutions which are mostly Commercial Banks are afraid of investing into this sector due to its risky nature.

High cost of utilities required for modern poultry management like electricity, water supply, transportation also hinders the development of the broiler industry. The inavailability of good strain of birds for rearing is another contributing factor to the decline: this is because a good strain with high feed conversion efficiency, disease resistance and high performance are needed for a profitable production.

The aforementioned facts indicate that though Nigeria is a Country in need of a quick protein source in order to meet up with the needs of its ever increasing population, with poultry production being identified as one of the quickest sources to meet up the demand. The industry has been strangled and its development hindered by many factors as mentioned above.

It can be correctly stated that all these problems are associated with costs of production of the industry. The aim of the study, therefore, is to analyse the performance of the broiler enterprise of the poultry production industry with regards to the financial management, in order to see how the goals of the producer and the consumer can be met simultaneously. Similarly to asses how the performance of this subsector can be enhanced to save it from extinction.

### **1.3 Objectives of the Study**

The broad objective of the study is to analyse the performance of a broiler production enterprise in order to pin-point weaknesses in the levels of performance which may be fully exploited.

Specifically the objectives are:

- i) to determine costs and returns in broiler production enterprise
- ii) to determine the efficiency measures of financial success for the broiler enterprise.
- iii) to discuss means of improving the performance of the broiler enterprise in the country.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Poultry Farming

There are three kinds of primary poultry farming enterprises in Nigeria. They are *breeding and hatchery operations, commercial egg production and broiler production.* (Dafwang, 1986).

**Breeding and hatchery** - This enterprise includes the rearing of parent stock hens and cocks in the correct ratio to provide fertile eggs which are then sold out to poultry producers who are engaged in the productions of Table eggs or commercial broilers. The primary product of these enterprises are the day old chicks. Eggs that are not good for hatching, the old hens and cocks are secondary products. Breeder flocks may be egg types or broilers.

**Commercial egg production** - For Table eggs production, pullet chicks are purchased from a hatchery and these are then brooded and reared to the age of about five months before they begin laying eggs. The chicks as purchased must have been divided (sexed) into males and females prior to sale. The Table egg producer only purchased the female chicks. The primary products of this enterprises are eggs which are sold for consumption. The hens are sold out as spent hens at the end of their laying cycle which usually is about one year.

**Broiler production** - Commercial day old broiler are purchased from the hatchery and reared to market weight; with good feeding and management broilers should be ready for market at between eight to nine weeks when they

should be weighing between 1.7 - 2.0 kg each. The broilers may be sold alive or processed and sold fresh or frozen.

## **2.2 Resource Requirements in Broiler Production**

For the establishment of broiler production enterprises there are certain resources that are necessary for its existence and successful continuity. The following sections discuss extensively the fundamental resources, as they relate to the successful establishment and development of the Broiler production.

### **(1) Availability of good strain of birds**

The availability of a good source of day old chicks with desirable characteristics of high disease resistance, high feed conversion efficiency etc. is vital to the success of a broiler production scheme. The effect of biological strain of birds for rearing is one of the greatest of all factors influencing gross output (yield) and profitability of broiler production.

A good strain of birds with good feed conversion efficiency which can reach the slaughter weight of 1.7 - 2.0 kg in 8 weeks is desired. These are seldom available in the country due to the continuous folding up of reputable breeding and hatcheries enterprises in the country. Hence, where these good strain are available their price tends to be exorbitant.

### **(2) Feeds**

Feeds cost constitute 60 - 70% of the total cost of production in broiler enterprise (Nuru, 1980 and Dafwang, 1986). The high cost of feed is associated with the general inflationary trend in the economy coupled with the competition

for maize (which forms the bulk of the poultry feed) from human beings who also need it for their own survival too.

The requirement for good quality feed is absolute for successful production. On farm feed mixing would be ideal for ensuring quality but feed has to be purchased from open market with the consequent problems of low quality sometimes due to adulteration.

### **(3) Medication and vaccinations**

This is necessary for the running of a broiler farm. The common vaccinations used are Marek's, Gumboro, New castle and Fowl Pox. Apart from these vaccines, there are also medication costs such as antibiotics and drugs against bacterial, fungal and protozoan diseases.

### **(4) Managerial Labour**

Labour is an essential requirement for the running of a broiler enterprise. Labour required can be both skilled and unskilled. The skilled labour is needed for the management of the farm i.e., in running the accounts of the farm, administration of drugs and vaccines while the unskilled is required in doing the menial jobs on the farm like provision of security, feeding the birds etc.

Labour source can either be hired or family labour. The large farms generally use more of the hired skilled labour than the small farms, who are mostly managed by the family and is often times unskilled. Apart from the overall management of the farm, skilled labour is needed on the farm to execute the following functions:

**i) Information and marketing**

Timely marketing of products is an absolute necessity for successful poultry production. The manager must from the start set up the machinery for gathering information needed to enhance improved productivity and rapid disposal of products.

He should be in constant contact with the nearest livestock extensions officer and should join professional association, such as the poultry Association of Nigeria to benefit from the exchange of information and support services.

**ii) Record keeping**

Good record keeping is indispensable for any business venture. Production, operational and accountant records must be properly kept and analysed regularly to aid in management decisions and to identify problem areas in the farm's operation.

Inventory records are also vital for security reasons and depreciation computations.

**iii) Risk management**

Poultry farming is generally a high risk enterprise. Disease or some natural disaster can wipe out a flock overnight. The scarcity and high cost of feeds has in the past forced farmers to sell birds at the peak of growth resulting in heavy economic losses. The poultry farmer must be fully aware of the risk involved and how to tackle it. The key to risk management is to plan properly before embarking on the farm, establish checks and balance that will minimise risks that can be avoided. Hence, only skilled, competent, trustworthy and

dedicated staff who are capable of providing optimum management at all times should be employed.

**(5) Housing**

Land for housing is selected based on easy access to marketing outlets, for the procurement of inputs and disposal of products. The desired features for the land to be selected for housing shall be a good drainage and freedom from features that would block free air movement. A certificate of occupancy is a *necessary condition if the project is to be financed by a lending agency.*

Layout of houses and infrastructures must be carefully planned to maximise space use. Attention should however be paid to recommended distance between buildings, cost effectiveness and disease control.

To determine the number and sizes of houses required, the floor space requirement per bird must be taken into account. The standard floor space requirement for broiler birds at various ages is provided by Olomu, 1980 and North, 1984 and is presented in the Table 2.1.

Table 2.1: Floor space required / bird for broilers of various ages.

Age of birds (Weeks)	Floor space/bird sq. m
0 - 6	0.5
6 - 10	0.8
10 and above	0.8

Source: Olomu, 1980 - Practical limits for backyard poultry keepers Napri Bulletin 2, 1980. North, 1984 - Commercial Chicken Production, Manual, 3rd Edition.

Poultry houses do not have to be limited in length if the terrain allows, it must however, be limited in width not more than eleven metres (11m) wide. This

is in order to facilitate natural ventilation, ease of movement and clearing and provide for equipment installation where necessary. The constructed houses must be cost effective but durable enough to withstand windstorm.

**(6) Feeding equipment and utilities**

Deep litter system of production is the most conventionally used method of raising broilers. Feeders and waterers are provided to the birds based on specifications to provide for good feeding and drinking space to the birds and to prevent feed wastage. There are usually chick feeders and drinkers for the chicks and chicken feeders and drinkers for the grown up birds.

Certain specifications have been provided by Ogundipe (1982) and Dafwang (1986) for the optimum number of feeders and drinkers required for optimum broiler production system. The list is shown in Table 2.2.

Utilities which include source of water, heat and transportation are also part of the necessary requirements for production. The source of water can either be a pipe-borne or dug well, electricity or lantern being the source of lightening and heating. A bicycle, motorcycle or a motor vehicle may be needed to ease transportation problem on the farm. The type of transport depends on the scale of production. As such access roads leading into the farm and a good housing layout that caters for free movement of vehicles is essential. The specifications for the utilities needed for efficient production is also presented in Table 2.2.

### 2.3 Production Standards for Broiler Production in Nigeria

Production standards are valuable aids for the evaluation of flock performance and for the preparation of feasibility studies. Various studies have been done to establish production standards for poultry in the country. Table 2.3 below shows the production standard for broiler birds reared for a period of eight weeks (8 weeks) as extracted from the works of Olomu (1979), Ogundipe (1982) and North (1984).

Table 2.2: Equipment and utilities requirement for 100 broiler birds reared on deep litter.

- 
1. 30 Chick feeders (2" of feeding space/bird, 3" deep)
  2. 20 Chick drinkers (4 litres capacity)
  3. 30 Chicken feeders (4" of feeding space/bird, 6" deep)
  4. 20 Chicken drinkers (8 litres capacity)
  5. 1 Water well
  6. 2,500 litres capacity tank for water storage
  7. 10 Buckets
  8. Feed scoops (use plastic plates or bowls)

#### Brooding requirement

9. 2 Brooder boxes (500 chicks capacity)
10. 30 (100 watts) bulbs or 30 kerosene lamps

#### Clearing and handling of manure

11. 5 Brooms
12. 3 Shovels
13. 2 Wheel barrows

#### Other equipment

14. Twines for hanging of feeders (if needed)
  15. Plastic sheet or tarpaulin for grow open-sided houses
  16. 1 hanging scale
  17. 1 heavy duty weight scale (optional)
  18. 10 crates for packing broilers
  19. Record books or sheet and file
  20. 10 Jute sack loads of litter materials.
-

Table 2.3: Performance levels and attainable goals for broiler production.

Performance Measure	Average	Performance Excellent	Level Goal
Average in weight at 8 weeks (kg)	1.65	2.20	1.90
Feed conversion at 8 weeks	2.30	2.00	2.10
Mortality %	4	2.0	-

Source: Production Standards for Poultry in Nigeria (Olomu, 1979; Ogundipe, 1982 and North, 1984)

When evaluating a project or making a feasibility report a flock with average performance levels in the Table above may have just a narrow profit margin or give even benefit cost ratio. While if the production performance levels is rated excellent, the benefit cost ratio may be highly positive. While, it is possible to attain such a laudable performance, chances are that most farmers can never achieve such productivity levels.

## CHAPTER THREE

### METHODOLOGY

#### 3.1 Data Collection

The data used for this study were collected from the primary source in the three States namely, Katsina, Kaduna and Kano. A survey of all the available poultry farms were conducted and those that are producing broilers were selected for the purpose of this study. The areas were chosen for the study because of their proximity to the researcher.

Personal interviews were conducted between the poultry farmers and the researcher and their production records examined critically. In order to obtain the needed information, questionnaires were also administered to poultry farmers who are literate in addition to the oral interview.

The variables upon which information were collected include: block size, cost of feeds, cost of day old chicks, medication cost, utilities cost, cost of building and equipment.

Similarly information on the selling price per bird at maturity and mortality rates were also collected.

##### i) Sample Size

A total of 40 available poultry farms were visited out of which only 19 farms are producing broilers. The 19 broiler farms are the focus of this study.. The low size of 19 broiler farms indicate that majority of poultry farms are concentrating on layer production. This also has an implication on the tools of analysis to be used and the final findings of the study.

### **3.2 Analytical Framework**

The analytical framework used to achieve the stated objectives are:-

- 1) Descriptive and quantitative statistics
- 2) Comparative analysis using the Net Farm Income (NFI) model

#### **3.2.1 Descriptive And Quantitative Analysis**

Simple descriptive and inferential statistics involving the use of measures of central tendency such as mean, median and mode. Percentage, ratios and measures of dispersion such as variance, standard deviation were computed to describe parameters like flock sizes, efficiency factors etc. This is in line with Olukosi and Erhabor (1988).

#### **3.2.2 Comparative Analysis Using Net Farm Income Model**

Comparative analysis is a simple diagnostic technique which involves the calculation of a number of "efficiency factors" which can be compared with similar measures calculated for comparable farms. The analysis is to pinpoint weaknesses in the enterprise which can be corrected and also highlight satisfactory levels of performance which may be fully exploited. To carry out this analysis, the factors have to be standardized to make the comparative analysis valid.

For several years, comparative analysis was used by the Agricultural Extension Service in the United Kingdom as the basis of their farm management advice (Upton, 1978). These techniques were also used to analyse the result of a farm survey in two villages in the guinea Savannah zone of Nigeria by Petu

and Upton (1966). The same technique was used by Norman, (1970) in his economic study of three villages in Zaria province: input/output relationships.

In the comparative analysis a logical sequence is followed in order to calculate the various efficiency measures from collected data, this is done through the determination of:

#### **1. Gross Receipts**

Also called total returns or total value products which is defined as the total output multiplied by the price per unit of production (which in this case is the broiler birds). It is influenced by:

- i) Price per unit of output
- ii) Scale of Enterprise
- iii) Mortality recorded during production

#### **2. Total Cost of Production**

Is the sum of operating and fixed costs.

- a) Operating costs are those costs that vary with the levels of output and which need to be re-incurred at each period of the production process.

Items included in the operating costs are:-

- i) Cost of day old chicks
- ii) Cost of feeds
- iii) Cost of labour
- iv) Cost of drugs and vaccines
- v) Cost of utilities (e.g. light, water etc.)

**b) Fixed Cost**

Are those that do not vary with the levels output in the short run. They are costs that must be met whether the production is good or poor.

Items included in this list are:-

- i) Depreciation on machinery, building and equipment
- ii) Wages of permanent staff
- iii) Interest on debt
- iv) Repairs of buildings
- v) Insurance

**c. Net Farm Income**

The net farm income which measures the return to unpaid family labour,, operators land, labour and management is notably represented as:

Net Farm Income = Gross receipts - Total costs of Production.

**d. Returns of Factors of Production**

If a value can be put on the producer's labour and family labour, the return to factors of production can be determined using the formulae:

- (i) Return to management = Net farm income - return to capital, unpaid family labour, operator's labour.
- (ii) Return to operators labour and management = net farm income - return to capital and unpaid family labour.
- (iii) Return to capital and management = Net farm income - return to unpaid family labour and operator's labour.

**e. Other Efficiency Measures**

Other efficiency measures of financial success apart from the net farm income and return to individual factors of production such as Gross Operating and Fixed ratio are also determined, measures of size, total invested capital, gross income and total input costs are also calculated.

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.1 The Distribution Pattern of the Poultry Farms by Location

The distribution pattern of the poultry farms visited based on their locations is shown in Table 4.1.

Table 4.1: Distribution of poultry farms by location.

Location	No of Farms
Katsina	7
Kano	9
Kaduna	7
Kafanchan	1
Zaria	8
Funtua	2
Malumfashi	2
Daura	1
Dutsin-ma	2
Danbatta	1
Total	40

Source: Survey data, 1993.

From the Table it can be seen that modern poultry production farms are located mostly in urban centres. This is where schools, Hotels, hospitals and industries exist. Poultry products are hardly consumed in rural areas where income earnings are low due to the high costs of poultry products - relative to other source of proteins.

#### 4.2 The Distribution Pattern of Poultry Farms by Type

Amongst the farms visited, most produce layers, some produce layers with broilers, or with hatcheries and there are few farms where broilers are produced solely. The distribution of the visited farms by type is shown in Table 4.2.

Table 4.2: Distribution of the poultry farms by type.

Type of farm	No. of Farms
Broilers only	4
Broilers and Layers	15
Layers only	20
Layers and hatchery	1

Source: Survey data, 1993.

From the Table, it can be seen that broiler birds are produced in 19 farms out of the 40 poultry farms visited in the study area, while layers are produced with broilers, the broiler birds are always numerically less than the layer birds. This indicates that the layer birds products i.e. (eggs) is demanded more than the broiler meat or more profit is generated by raising layers than by raising broilers. Obviously, broiler meat faces competition from other source like, local chickens, spent birds (culls), beef, mutton and beans.

#### 4.3 The Period of Production for the Broiler Birds

Findings of the study indicates that broiler production is mostly targeted towards particular occasions when festivities take place such as Christmas, Sallah, Easter etc. The production pattern is shown in Table 4.3.

Table 4.3: Production pattern of poultry farm.

Period	No of Farm Production	%
Easter	4	21.1
Christmas	8	42.1
Sallah	5	26.3
Others	2	10.5
Total	19	100.0

Source: Survey data, 1993.

It can be seen that of the 19 broiler production recorded in the study, about 90 percent is targeted towards particular festivals when demand is expected to occur and only about ten percent (10%) is for non-occasional period.

The low production of broiler meat during non-occasional period is due to stiff competition faced by broiler meat from other cheaper sources of meat for every day use such as local chickens, spent birds (culls), beef, mutton and even cowpeas as mentioned earlier.

#### 4.4 The Distribution Pattern for the Broiler Farms by Size

The distribution pattern of the broiler farms based on their flock sizes is shown in Table 4.4.

The scale of production in broiler from the Table above is quite low. It can be seen that, majority of the farms are raising less than 500 birds, and infact only four (4) farms amongst the farms visited raise over 1,000 birds. This shows that, the quantity of broiler even where they are raised is quite low.

Table 4.4: The Distribution of the Broiler farms by size.

Flock size (birds)	Number of farms	% of Total farms
100	3	5.7
150	1	5.2
200	3	15.7
270	1	5.2
300	1	5.2
320	1	5.2
400	2	10.5
500	3	15.7
1000	2	10.5
1500	1	5.2
2020	1	5.2

Source: Survey data, 1993.

Various factors account for the low production figures but important among the factors is associated with cost of production especially that of feeds and the existing poor market for mature broiler birds. To maximise his profit a farmer needs to dispose his matured birds the moment they are matured and any delay may narrow his profit margin because of the high feed intake of broiler birds, and these feeds are very costly. Similarly, feed conversion ratio goes down with age and more fat is produced which reduces the quality. Hence, the poor market especially in non-occasional period coupled with the high initial capital outlay required to start production hindered the farmer from operating at large scale.

Low scale production has a lot of disadvantages which includes high cost per unit of output and all advantages associated with economies of scale are not reaped. Definitely, it is a known fact that economies of scale lowers cost of production and improves the profit margin accruing to the farmer. Low production

cost would lower the selling price which would boost demand for the broiler meat.

In order to achieve the objectives of this study and for the convenience of analysis and discussions, the broiler farms visited in the study area are divided into two groups. The first group i.e. Group 1 consist of all farms with flock size of less than 400 birds and the second group i.e. Group 2 consist of all farms with flock sizes of more than 400 birds.

Group 1 consists of 10 farms which constitute 52.6 percent of the total farms in the study while Group 2 with 9 farms constitute 47.4 percent of the total farms. This shows that farms with less than 400 birds predominates in the study area. This classification is depicted in Table 4.5.

Table 4.5: Classification of the broiler farms into groups based on size.

Groups	Flock size	No. of farms	% of total farms
Group 1	less than 400 birds	10	52.6
Group 2	over 400 birds	9	47.4
TOTAL		19	100.00

Source: Survey data, 1993.

#### **4.5 Analysis of Costs of Production**

Tables 4.6 and 4.7 show the variable costs, the fixed costs and the total costs incurred by the broiler farmers. For all of the enterprises, variable costs account for higher proportion of total costs ranging from an average of 94.9 percent in Group 1 farms to 97.2 percent in Group 2 farms. The overall average

Table 4.6: Budget of cash operating expenses and fixed costs (group 1).

F/No.	Flock Size	Variable Costs (N)										Fixed Costs (N)				
		Feeds % of TVC	Chicks % of TVC	TVC	Labour % of TVC	Medication % of TVC	Utilities % of TVC	Total Var Costs (TVC)	% of TC	Depr. on Building & Equipment	% of TC	Total Cost				
1	100	2695	55	1200	24.5	350	7.2	488	9.9	150	3.0	4883	95.3	242	4.7	5125
2	100	6300	64.3	1500	15.3	1100	11.2	577.5	5.9	315	3.2	9792.5	97.3	273.3	2.7	10065.8
3	100	3488	61.9	1300	23.0	160	2.8	455	8.0	235	4.2	5638	93.7	377.2	6.3	6015
4	150	9090	78.9	1800	15.6	335	2.9	150	1.3	145	1.2	11520	98.6	155.6	1.4	11675.6
5	200	3491	42.4	2600	31.6	770	9.4	797.5	9.6	567	6.9	8225.5	91.7	738	8.2	8963.5
6	200	11175	68.6	3000	18.4	975	5.9	830	5.0	300	1.8	16280	90.5	1698.6	9.4	17978.6
7	200	6480	63.6	2400	23.5	770	7.5	445	4.3	80	0.8	10175	94.5	583.3	5.4	10758.6
8	270	18430	80.3	3510	15.3	350	1.5	519	2.3	130	0.6	22939	95.1	1181.9	4.9	24120.9
9	300	16235	71.2	3750	16.4	2000	8.7	580	2.5	230	1.0	22795	96.2	906	3.8	23701
10	320	11340	64.6	3840	21.9	1100	6.2	1080	6.1	180	1.0	17540	96.1	700	3.9	18240

Source: Survey data, 1993.

Table 4.7: Budget of cash operating expenses and fixed costs (group 2).

F/No.	Flock Size	Variable Costs (N)										Fixed Costs (N)				
		Feeds	% of TVC	Chicks	% of TVC	Labour	% of TVC	Medication	% of TVC	Utilities	% of TVC	Total Var Costs (TVC)	% of TC	Depr. on Building & Equipment	% of TC	Total Cost
1	400	13620	57.8	8000	33.9	480	2.0	960	4.0	480	2.0	23540	97.9	498.6	2.1	24038.6
2	400	26778.5	68.4	6900	17.6	400	1.0	4692	11.9	370	1.0	39141.5	98.0	778.6	2.0	39920
3	500	9381	55.0	6000	35.1	800	4.6	710	4.1	120	0.7	17051	95.6	772.6	4.4	17826.6
4	500	15120	64.5	6000	25.6	1000	4.2	1060	4.5	255	1.5	23435	97.5	600	2.5	24035
5	500	25000	66.6	6000	15.9	520	1.4	2000	5.3	520	1.4	37520	97.7	854	2.2	38374
6	1000	30021	63.2	12000	25.3	300	0.6	3020	6.3	650	1.4	47451	96.9	1500	3.0	48951
7	1000	19800	56.1	12000	34.0	775	2.1	1505	4.2	300	0.8	35285	98.3	605	1.7	35890
8	1500	84231	76.8	18000	16.4	3100	2.8	2370	2.1	775	0.1	109576	96.7	3667	3.2	113243
9	2020	80029	69.1	24240	20.9	4000	3.4	4336	3.7	3100	2.6	115705	96.3	4334	3.6	120039

Source: Survey data, 1993.

for variable costs as a proportion of total cost of production in broiler business in the area of study is over 90 percent in all the farms

The fixed costs in turn accounts for less than 10 percent of the total costs incurred in the broiler production in the area for all the groups. This clearly shows that broiler production is dominated by variable cost rather than fixed cost. That the fixed costs are indeed negligible. This cost structure makes poultry business highly risky, in that a slight misfortune or accident can wipe out the capital of the farmer. This also makes it unattractive for financial institutions to provide credit to this sub-sector because in the event of failure they have very little to rely on to recover their money unless the operator insured his business under National Agricultural Insurance Scheme (NAIS).

#### **A. ANALYSIS OF THE VARIABLE COSTS**

(i) **Feeds:** Feeds used by the farmers were purchased from dealers of commercial feed manufacturers like Sanders, Noma, and Pfizer companies. The feed cost per bag was found to vary during the year of the study. A 25kg bag sells at ₦154.00 in January, 1993 and at ₦227.00 for the same bag in December of the same year. This shows an increase of 47 percent of the price in twelve month.

Farmers who produce the feeds locally were found to incur lower feed cost compared to their counterparts who purchase from manufacturers. It was observed that while a bag was selling at ₦227.00 a farmer was found to be producing his own feed at ₦146.00 per bag and another at as low as ₦90.00 per bag.

The feed cost was found to account for the highest proportion of the total variable costs incurred. It is averagely 65.08 percent for Group 1 farms and 64.1 percent form farms in Group 2. The overall mean for feed cost as a proportion of variable costs in the study area is about 65%.

This shows that, feed cost is the most important variable factor in broiler production (Tables 4.6 and 4.7). The high feed costs found in the study area is associated with the competition for maize which is the main ingredient for feed making between man and birds. Both need it to survive, hence a high demand for maize. Another factor is the inflationary trend of the general economy which is exacerbated by devaluation of the Naira. Some of the vital ingredients for feed making are imported at very high costs.

*(ii) Day old chicks:* The costs of day-old-chick in the study area has been found to increase over time. While it was found to be ₦12.00 in January 1993, it went up to ₦20.00 per chick in the month of December of the same year. The increase in the price is due to general inflationary trend in the economy and increase in prices of other related inputs.

*(iii) Labour:* The cost associated to labour in the study area is generally low. This is due to the utilisation of family labour by majority of the farms with the exception of few farms run by the government. Similarly, most of the labour used is unskilled and this makes it cheap except on few farms where skilled labour is used.

Labour cost as a proportion of total variable cost is generally less than 10 percent as shown in Tables 4.6 and 4.7. Lower cost of labour is observed among

the group 2 farms which is due to economies of scale achieved by the size of production. A single caretaker looks after more birds in group 2 farms compared with smaller flock size in group 1 farms. The proportion of labour cost is less than 5 percent in all farms in group 2.

(iv) **Medication:** Vaccinations schedule was found to be followed by majority of the farmers. The common vaccinations used are the Marek's disease vaccine, Gumboro Vaccine, Newcastle and Fowl-fox vaccines.

The Marek's disease vaccination is administered at day-old, the gumboro vaccine is administered in two courses, the New-Castle vaccine in three courses while the fowl-fox vaccine is administered in a single course.

Medication through the use of drugs such as antibiotics, coccidiostats, anti-fungal, and anti-protozoan drugs were used for diseases control. Generally the medication cost incurred depend on the efficiency and skills of the farmer. It is also determined by the occurrence of a disease outbreak in a flock. It is usually less than 10 percent of the total variable costs except in one case (farm 2) Table 4.7, where it exceeds 10 percent due to a disease out-break in the farm.

(v) **Utilities:** Many utilities are used in broiler farming to facilitate production activities. Amongst these utilities are a source of water which can either be dug-well or pipe borne water, source of lighting and heating which is either a lantern, stove or electricity.

Transportation of products and inputs also require the services of either a bicycle, motor cycle or motor vehicle.

Majority of the farm utilise pipe borne water as they are largely situated in the urban area and in few instances water from wells are also found to exist. Lanterns and kerosene stoves are the commonest sources of heating and lighting in the study area.

Most of the farms except the few large ones do not have a private means of transport, they utilise the commercial sources for transporting inputs to the farm and products to the buyers.

The cost of utilities account for a small proportion of total variable costs in broiler production. It is usually less than 3 percent (Tables 4.6 and 4.7). Cost of utilities is however gaining more prominence with the escalation in inflation within the macro-economy.

## **B. ANALYSIS OF THE FIXED COSTS**

(i) **Housing:** Three types of housing are identified in the study area. These are the mud type, the Zinc type and the permanent cement concrete type. Deep litter rearing system is used in all farms and none; used the automatic watering and feeding system.

Cost effectiveness, durability and safety are the factors considered by broiler farmers in selecting the housing type. Though, the initial cost of erecting the broiler houses were seen to be quite high and took a very high percentage of the initial capital outlay for broiler business, the housing is not used up during a single production period, but covers a long span of time, usually many years. Hence, in considering the value of housing in a study like this, the depreciated value is usually assumed and considered. Depreciation is a function of time and

use, and it involves the pro-rating of the original cost of an asset over its useful life span. Different assets lose value at different rates, hence different methods of calculating depreciation have been developed. The "straight line method" of determining depreciated value of housing is adopted in this study because of its simplicity.

The straight line depreciation method assumes that an asset loses its value at a constant rate over time. Depreciation is the difference between the purchase price (P) and the salvage value (S) divided by the number of years of life of the asset (n).

$$\text{i.e. } D = \frac{P - S}{n}$$

Therefore, even though the cost of housing may be high when taken in one unit, the depreciated value for a particular production period is usually small. The depreciated value of housing and equipment which constitutes the fixed costs are found to range from 1 to 10 percent of the total cost of production. This is shown in Tables 4.6 and 4.7.

(ii) **Equipment:** Ordinary feeders and plastic waterers are used by the broiler farmers in the area under the study. The number of feeders and waterers are dependent on the flock size of a farm. Like the case of housing discussed above, the equipment forms part of the fixed assets in broiler enterprise. The depreciated value of the equipment like the housing are similarly taken for the purpose of the study. They are lumped together with the cost of housing to form the fixed costs. The cost of equipment as a proportion of the fixed cost is negligible.

#### 4.6 Analysis of the Net Farm Income (NFI)

The Net Income (NFI) an important measure of financial success of a farm business is given by the Gross Receipt (GR) - Total Costs (TC) of a production and is shown for the two groups in Tables 4.8 and 4.9.

The **Gross Receipts** for the broiler farms are from the sales of matured birds reared usually at 8 - 12 weeks of age. The price per birds is found to range from ₦70.00 to ₦120.00 depending on the time of sales i.e. whether Sallah, Christmas, Easter or Ordinary period. The price per bird is observed to be higher during the period of festivities and special occasions. Another determinant of price observed is the age of the bird. The older, the heavier and the higher the selling price.

The Gross receipts realised from the sale of the birds among the various farms in the study are shown in Tables 4.8 and 4.9. The Total Costs of production have been discussed earlier and are shown for the various farms in Tables 4.6 and 4.7.

The net farms Income is found to be higher for the Group 2 farms (i.e. farms with higher flock sizes) than Group 1 farms (i.e. farms with lower flock sizes). It is on the average ₦19,541.4 and ₦3,020.00 respectively; this is presented in Table 4.10. This fact indicates that a farmer would realise higher net income when he raises his scale of production and ultimately be more financially successful.

The high net income realised in Group 2 farms is certainly due to the effect of economies of size. The economies of scale lowers production costs per bird and the profit obtained after sales increases.

Table 4.8: Production Cost, Gross Returns and Net Farm Income for Group 1 Farms.

F/No.	Flock Size	Price/Chicks	Variable Cost (₦)							Total Variable Cost (₦)	Total Fixed Cost (₦)	Production Cost (₦)	Total Rearing Period (week)	Mortality	Selling Price/Bird (₦)	Gross Sale (₦)	Net Farm Income (₦)
			Cost of Chicks	Cost of feeds	Cost of Labour	Cost of Medication	Cost of Utilities	Cost of	Cost of								
1	100	12	1200	2695	350	488	150	4883	242	5125	10	5	105	9975	4850		
2	100	15	1500	6300	1100	577.5	315	9792.5	273.3	10065.8	12	2	90	8820	-1245.8		
3	100	13	1300	3488	160	455	235	5638	377.2	6015	8	1	85	8415	2399.2		
4	150	12	1800	9090	335	150	145	11520	155.6	11675.6	11	2	110	16280	4604.2		
5	200	13	2600	3491	770	797.5	567	8225.5	738	8963.5	7	9	95	18335	9371.5		
6	200	15	3000	11175	975	830	300	16280	1698.6	17978.6	13	15	100	18500	521.2		
7	200	12	2400	6480	770	445	80	10175	583.3	10758.3	11	4	100	19600	8841.5		
8	270	13	3510	18430	350	519	130	22939	1181.9	24120.9	10	10	85	21320	-2800.9		
9	300	12.5	3750	16235	2000	580	230	22795	906	23701	8	29	80	21680	-2021		
10	320	12	3840	11340	1100	1080	180	17540	700	18240	11	21	80	23920	5680		

Group Average NFI = 3020

Source: Survey data, 1993.



**Table 4.9 - Production Cost, Gross Returns and Net Farm Income for Group 2 Farms.**

F/No.	Flock Size	Price/Chicks	Variable Cost (₦)					Total Variable Cost (₦)	Total Fixed Cost (₦)	Production Cost (₦)	Total Rearing Period (week)	Mortality	Selling Price/Bird (₦)	Gross Sale (₦)	Net Farm Income (₦)
			Cost of Chicks	Cost of feeds	Cost of Labour	Cost of Medication	Cost of Utilities								
1	400	20	8000	13620	480	960	480	23540	798.6	24038.6	8	30	120	44400	20361.4
2	400	18	6900	26795	400	4692	370	39141.5	778.6	39920	8	65	120	40200	280
3	500	12	6000	9381	800	710	120	170051	772.6	17826.6	8	11	70	34230	16403.4
4	500	12	6000	15120	1000	1060	255	23435	600	24035	10	30	80	37840	13805
5	500	16	6000	25000	520	2000	520	37520	854	38374	12	50	90	40500	2126
6	1000	12	12000	30021	300	3020	660	47451	1500	48951	10	60	80	75200	26249
7	1000	12	12000	19800	775	1505	300	35285	605	35890	8	24	70	68460	32570
8	1500	12	18000	84231	3100	2370	775	109576	3667	113243	11	93	90	126630	13387
9	2020	12	24240	80029	4000	4336	3100	115705	4334	120039	8	123	90	170730	50691
												Group Average	NFI = 19541.4		

Source: Survey data, 1993.

Table 4.10: Average Net farm income for the two groups of farms.

Groups	Average net farm income (N)
Group 1	3,020.00
Group 2	20,541.40

Source: Calculated from the data.

A 't' test was conducted to test the significance of the difference in the NFI's of the two groups of broiler farms in the study. The difference between the two was found to be highly significant. The result of the test is shown in Table 4.11.

Table 4.11: Test significance of difference in (NFIs) of the two groups of farms.

Groups	Calculated	Tabulated 't'		D.f.	Remarks
		5%	1%		
GR 1 & GR 2	165.1	2.11	2.89	17	Highly significant

Source: Calculated from the data.

However, to base financial success of a business on the criteria of NFI alone might be misleading, because it may not be a good reflection of the amount of capital, labour and management involved in the production processes. There is, therefore, a need to examine other measures of financial success of a business such as returns to factors of production like labour and management, return to capital invested and ratios like the Gross ratio, operating ratio, the fixed ratio and other relevant measures in order to make the findings valid and conclusive.

These other measures which complement the Net farm income are discussed in sections that follow.

#### 4.7 The Effect of Enterprise Size on Cost of Production

In this section the volume of production and its effects on per unit costs were considered. Average variable costs per bird were calculated for each enterprise and is presented in Tables 4.12 and 4.13.

It is seen from the Tables that average variable cost per bird i.e. the per unit cost vary from one farm to another. The costs decreased as their sizes increased. This can be seen from Tables 4.12 and 4.13 that on the overall average farms in Group 2 with higher flocksizes have lower average variable cost per bird of N58.41 than the Group 1 farms with an average cost per bird of N66.85.

Table 4.12: Average variable cost per bird (group 1).

Farm No	Flock Size (birds)	Total variable cost (N)	Average Variable Cost/bird (N)
1	100	4883.0	48.83
2	100	9792.50	97.92
3	100	5638	56.38
4	150	11520	76.80
5	200	8225.50	41.12
6	200	16280	81.40
7	200	10175	50.87
8	270	22939	84.40
9	300	22795	75.98
10	320	17540	54.81
Average			66.85

Source : Survey data, 1993.

Table 4.13: Average variable cost per bird (group 2).

Farm No	Flock Size (birds)	Total variable cost (N)	Average Variable Cost/bird (N)
1	400	23540	58.85
2	400	39141.5	97.85
3	500	17051	34.10
4	500	23435	46.81
5	500	37520	75.04
6	1000	47451	47.45
7	1000	35285	35.28
8	1000	109576	73.05
9	1500	115705	37.23
		Average	58.41

Source : Survey data, 1993.

#### 4.8 The Return to Operator's Labour and Management

The return to operators' labour and management is given as the Net Farm Income (NFI) realised by the operators' minus the cost of capital invested by the operator in the farm. That is:

$$\text{The return to operator labour and management} = \text{NFI} - \text{Cost of Capital Investment}$$

The cost of capital is the product of average capital invested in the business multiplied by the opportunity cost of using that capital in an alternative enterprise (the opportunity cost is taken as the current bank lending rate which is 21%) i.e. cost of capital = Average capital invested x opportunity cost of capital.

The return to operators' labour and management is the share of the operators' labour and management in the Net Farm Income (NFI) when cost of

capital is taken out. It is a measure of management efficiency and effectiveness.

The returns for the two classes of farms are computed in Tables 4.14 and 4.15.

Table 4.14: Return to operator's labour and management.

S/No	Flock Size	Net Farm income (N)	Average Capital investment (N)	Opportunity Cost of Capital	Cost of Capital	Return to Labour and Management
1	100	4850	5125	0.21	1076.25	3773.75
2	100	-1245.8	10065.8	0.21	2113.81	-3359.6
3	100	2399.8	6015.2	0.21	1263.19	1136.31
4	150	4604.4	11675	0.21	2451.87	2152.53
5	200	9371.5	8963.5	0.21	1882.33	7489.17
6	200	521.4	17798.6	0.21	3775.50	-3254.10
7	200	8841.7	10758.3	0.21	2259.39	6582.46
8	270	-2800.9	24120.9	0.21	5065.21	-7866.29
9	300	-2021	23701	0.21	4997.21	6998.20
10	320	5680	18240	0.21	3830.40	-1849.60
Group Average						1180.3

Source : Survey data, 1993.

Table 4.15: Return to operator's labour and management.

S/No	Flock Size	Net Farm income (N)	Average Capital Investment (N)	Opportunity Cost of Capital	Cost of Capital	Return to Labour and Management
11	400	20361.4	24038.6	0.21	5048.11	15313.29
12	400	280	39920.0	0.21	8383.20	8103.20
13	500	16403.4	17826.6	0.21	3743.58	12659.82
14	500	13805	24035.0	0.21	5047.35	8757.65
15	500	2126	38374.0	0.21	8058.54	-5932.50
16	1000	26249	48951	0.21	10279.71	15969.29
17	1000	32570	35890	0.21	7536.90	25033.10
18	1500	13387	113243	0.21	23781.03	-10394.30
19	2020	50691	120039	0.21	25208.19	15482.81
Group Average						9505.8

Source:: Survey data, 1993.

Table 4.16: Average return to operator's labour and management for the two groups.

Groups	Average return to Management
Group 1 farms	1180.3
Group 2 farms	9505.8

Source: Calculated from the data.

An independent 't' test was conducted to test the statistical significance of the difference between groups and the result is shown in Table 4.16.

Table 4.17: Test significance of difference in average return to management.

Groups	Calculated	Tabulated 't'		D.f.	Remarks
		5%	1%		
1 and 2	114.0	2.110	2.898	17	Highly significant

Source: Calculated from survey data, 1993.

The return to the labour and management are generally very low in the Group 1 farms. The average figure for the group is N1,180.3. It can be observed that, there are cases whereby farms with similar flock size have different returns to labour and management. This may be due to a number of reasons. For instance, when we consider farms 1, 2 and 3, with flock size of 100 birds, the return to labour and management is higher in Farm 1 than Farms 2 and 3, due to efficient feed use by the manager. The farm is owned by a trained poultry farmer who looks after the birds well and prevents feed wastage on the farm. Similarly, his production has been targeted to period when he can fetch a good price for his birds. It can be seen that, while Farmer 1, used N2,695 value of feed, farmer 2, used N6,300 worth of feeds to raise the same number of birds and farmer

used ₦3,488 worth of feeds for the same number of birds. Similarly, while Farmer 1, sold his birds reared for 10 weeks at ₦105/bird, farmer 2, sold his birds reared for 12 weeks at ₦90/bird and farmer 3, who reared for 8 weeks at ₦85/bird. This variation can be attributed to feed utilisation efficiency of the separate farms and the time of sales.

When Farms 5, 6 and 7 with flock size of 200 birds are considered, the same fact emerges, that farms that are able to lower their feed cost get more returns to their labour and management. For instance, Farmer 5, who reared his birds for only 7 weeks and incurred a feed cost of ₦3,491 records higher return to labour and management than Farms 6 and 7. In fact, Farm 6, that had a rearing period of 13 weeks and resultant feed cost of ₦11,175 for the same 200 birds has a negative return to labour and management.

In general, it can be observed that high feed cost as in Farm 8 and low selling price per bird as in Farms 9 and 10 are among the contributing factors causing low return to labour and management. High mortality rate as in Farms 6, 9 and 10 are other reasons for low return to labour and management.

Therefore to improve the return to labour and management, the farmer needs to utilise his feeds efficiently, so as to produce mature birds within the shortest period of time and target his production to periods when there is a high demand for the birds.

When taken as a group the farms in Group 2 have been found to have higher return to labour and management on the average than the farms under Group 1. The average figure for Group 2 farms is ₦9,505.8 very much higher

than the average figure of ₦1,180.3 for Group 1 farms. As explained above, farms with similar flock size may have different returns to labour and management under their feed utilisation efficiency i.e. feed costs, rearing period and time of sales differ. High mortality and high medication cost may lower return to labour and management as in Farm 12 where a farmer producing 400 birds with high medication bill and high feed cost recorded a negative return to labour and management in contrast to Farm 11 with the same flock size who recorded a positive value.

In general, a farmer has higher returns to his management when he is operating a large scale of production than when he is operating a small one. This has been shown in Table 4.16 where the average figures for Group 1 (smaller farms) are compared with Group 2 (larger farms) with figures of ₦1,180.3 and ₦9,505.8, respectively. This definitely has to do with the effect of economies of scale; for instance, while a farmer raising 2000 birds may require just one caretaker, the other person operating 100-300 birds may also require the services of one man to take care of the farm. One can vividly see the advantage that the one with the larger flock will have over the one with smaller flock. Definitely, the one with larger flock would derive more returns to his labour and management than the smaller one, because the fixed assets are spread over larger number of birds.

Hence, it could be asserted that management and labour are being more efficiently utilised in larger size than smaller size production.

#### 4.9 Returns to Management per Bird

Returns to management per bird is shown for the Group 1 and Group 2 farms in Tables 4.18 and 4.19 respectively. The returns to management per bird averages ₦7.23 for Group 1 farms while it averages ₦14.73 for the Group 2 farms (with the larger sizes). The per unit return to management can be seen to be higher for the Group 2 farms with the larger farm than the group 1 sizes with smaller sizes (fewer birds). This is an indication that profitability increases with flock size in broiler enterprise.

Table 4.18: Per unit return to management per bird (group 1).

Farm No	Flock Size (Birds)	Return To Management (₦)	Per Unit Return to Management / Bird (₦)
1	100	3773.75	37.73
2	100	-3359.60	-33.59
3	100	1136.61	11.36
4	150	2152.53	14.35
5	200	7489.17	37.44
6	200	-3254.10	-16.27
7	200	6582.46	32.91
8	270	-7866.29	-29.13
9	300	6998.20	23.22
10	320	-1849.60	-5.78
		Average	7.23

Source: Survey data, 1993.

Table 4.19: Per unit return to management per bird (group 2).

Farm No	Flock Size (Birds)	Return To Management (₦)	Per Unit Return to Management / Bird (₦)
11	400	15313.29	38.28
12	400	8663.20	21.65
13	500	12659.65	25.31
14	500	8758.65	17.51
15	500	-5932.50	-11.86
16	1000	15969.20	15.96
17	1000	25033.10	25.03
18	1500	-10394.30	-6.92
19	2020	15482.81	7.66
Average			14.73

Source: Survey data, 1993.

#### 4.10 The Returns on Capital

The returns on capital gives the efficiency with which the capital invested is used. It is another measure of financial success. It gives the net farm income realised as a percentage of the total capital invested in the farm. The percentage return is the amount realised from the producer's capital in the business. It is given by

$$\text{Return on capital} = \frac{\text{NFI}}{\text{Total capital invested}} \times 100$$

The returns on capital for the two groups are computed in Tables 4.20 and 4.21 for small and large farms respectively.

Table 4.20: Return to capital investment (group 1).

Farm No	Flock Size (Birds)	Net Farm Income (₦)	Total Capital Invested	Returns on Capital Invested (%)
1	100	4850	5125	94.6
2	100	1245.8	10065.8	-12.4
3	100	2399.8	6015.2	39.8
4	150	4604.4	11675.6	39.4
5	200	9371.5	8963.5	105.4
6	200	521.4	17795.3	2.8
7	200	8841.7	10758.3	82.2
8	270	2800.9	24120.9	-11.6
9	300	2021	23701	-8.5
10	320	5680	18240	31.1
Group Average				36.20

Source: Survey data, 1993.

Table 4.21: Returns to capital investment (group 2).

Farm No	Flock Size (Birds)	Net Farm Income (₦)	Total Capital Invested	Returns on Capital Invested (%)
11	400	20361.4	24038.6	84.7
12	400	280	39920	0.7
13	500	16403.4	17826.6	92.0
14	500	13805	24035	57.4
15	500	2126	38374	5.5
16	1000	26249	48951	53.6
17	1000	32570	35890	90.7
18	1500	13387	113243	11.8
19	2020	50691	120039	42.2
Average				48.73

Source: Survey data, 1993.

Table 4.22: Average return to capital investment for (2 groups).

Groups	Average return to capital
Group 1 Farms	36.20
Group 2 Farms	48.73

Source: Calculated from survey data.

Table 4.23: Test of significance of difference in average return to capital.

Groups	Calculated	Tabulated 't'		D.f.	Remarks
		5%	1%		
1 and 2	2.02	2.110	2.898	17	Not significant

Source: Calculated from survey data.

The returns on capital in the Group 2 farms are only slightly higher than in the Group 1 farms. It is averagely 48.7 and 36.2 percent in the Group 2 and Group 1 farms respectively. On the overall, average return on capital in the broiler industry in the study area is about 45%. This means for every Naira invested in broiler production 45K would be realised as profit.

#### 4.11 Return per Naira Invested on Feeds

The feed cost has been found to account for 64 - 65 percent of the total variable costs incurred in the broiler production as can be seen in Tables 4.8 and 4.9. This makes feed to be the most important variable resource in broiler enterprise. Hence, any measure that will reduce feed cost would definitely lower production costs.

The return per Naira invested on feeds is shown in Tables 4.24 and 4.25 for Group 1 and Group 2 farms respectively. From the Tables it can be observed that the returns per Naira invested on feeds is slightly higher for Group 2 farms

than the Group 1 farms. It averages 0.83 and 0.73 for the two groups respectively.

This indicates that there is an increase in feed use efficiency amongst the larger flocks than the smaller flocks. This can be attributed to the effect of economies of size in the broiler production enterprises.

Table 4.24: Return per Naira invested on feeds (group 1).

Farm No	Flock Size (Birds)	Net Farm Income (N)	Capital Invested on Feeds (N)	Returns Capital Invested on feeds (N)
1	100	4850	2695	1.79
2	100	1245.8	6300	-0.19
3	100	2399.8	3488	0.68
4	150	4604.4	9090	0.50
5	200	9371.5	3491	2.68
6	200	521.4	11175	0.04
7	200	8841.7	6480	1.36
8	270	2800.9	18430	-0.15
9	300	2021	16235	0.12
10	320	5680	11340	0.50
Average				0.73

Source: Survey data, 1993.

Table 4.25: Return per Naira invested on feeds (group 2).

Farm No	Flock Size (Birds)	Net Farm Income (N)	Total Capital Invested	Returns on Capital Invested (%)
11	400	20361.4	13620	1.49
12	400	280	26779.5	0.01
13	500	16403.4	9381	1.74
14	500	13805	15120	0.91
15	500	2126	25000	0.08
16	1000	26249	30021	0.87
17	1000	32570	19800	1.64
18	1500	13387	84231	0.15
19	2020	50691	80029	0.63
Average				0.83

Source: Survey data, 1993.

#### 4.12 The Gross Ratio

The gross ratio measures the ultimate solvency and success of farm. It is another "efficiency" factor considered in a production enterprise. It measures the overall financial success of a business.

A less than 1 ratio is desirable for any business. The lower the ratio the higher the return per Naira invested. A higher but less than 1 ratio might be tolerated for a farm involving heavy capital investment. However, a greater than 1 ratio might be disastrous for farm business and might indicate over utilisation of a certain resource. If this happen management should consider ways of reducing cost and increasing gross margin. The (GR) is the total farm expenses (TFE) divided by the Gross Income (GI) i.e.

$$GR = \frac{TFE}{GI}$$

When the TFE is obtained by summing up the operating costs and fixed costs in the farm.

Table 4.26: The gross ratio (group 1).

Farm No	Flock Size (Birds)	Gross Income (N)	Total Farm Expenses	Gross Ratio
1	100	9975	5125	0.51
2	100	8820	10065.8	1.14
3	100	8425	6015.2	0.71
4	150	16280	11675.6	0.71
5	200	18335	8963.5	0.49
6	200	18500	17798.6	0.97
7	200	19600	10758.3	0.55
8	270	21320	24120.9	1.13
9	300	21680	23701	1.09
10	320	23920	18240	0.76
			Average	0.80

Source: Calculated from survey data.

Table 4.27: The gross ratio (group 2).

Farm No	Flock Size (Birds)	Gross Income (N)	Total Farm Expenses	Gross Ratio
11	400	44400	24038.6	0.54
12	400	40200	39920	0.99
13	500	34230	17826.6	0.52
14	500	37840	24035	0.63
15	500	40500	38374	0.95
16	1000	75200	48951	0.65
17	1000	68460	35890	0.52
18	1500	126630	113243	0.89
19	2020	170730	120039	0.70
Average				0.71

Source: Calculated from survey data

Table 4.28: Average gross ratio for the two groups.

Groups	Average gross ratio
Group 1	0.80
Group 2	0.71

Source: Calculated from survey data.

Table 4.29: Test of statistical significance of difference in Gross ratio between the two groups.

Groups	Calculated	Tabulated 't'		D.f.	Remarks
		5%	1%		
1 and 2	0.15	2.110	2.898	17	Not significant

Source: Calculated from survey data.

The gross ratio for the small farms is shown in Table 4.26. It can be seen that, all farms operating at a loss i.e. negative NFI have a very high gross ratio. This indicates an over utilisation of a certain resource which in this case is the

"feeds". Hence, for these farms to continue in the business, measures to improve feed utilisation have to be devised. Another approach is to find means of improving Gross income i.e. income from sales. This can be done by reducing mortality, planned and targeted production which would take the advantage of market.

A similar situation is found for the large farms, that the GR is related positively to the Net Farm Income (Table 4.27). Comparatively, the smaller farms are found to have a higher gross ratio than the larger ones on the average (Table 4.28). The difference is however not statistically significant (Table 4.29). The gross ratio for broiler farm in the study is about 0.60 on the average.

The statistics justify the assumption that the farm expenses in broiler industry is dominated by a common input i.e. feed, irrespective of the scale of production. Hence, as long as the broiler farmers use the same source of feeds and sell at common market, the gross ratio which is indicated by total farm expenses divided by gross farm income would not differ significantly, whether in small or big enterprises.

#### **4.13 The Operating Ratio**

The operating ratio (OR) shows the proportion of gross income that goes to pay for the operating costs. The operating costs is directly related to the farm variable input use. The operating costs is the decision making tool with regards to factor adjustment during a production period.

The operating ratio is measured by dividing the Total Operation Expenses (TOE) by the Gross Income (GI) i.e.  $OR = TOE/GI$ .

The operating ratio of 1 means the gross income barely covers the expenses on the variable inputs used on the farm. In other words, such a business could survive only in the very short run and could fold up if correct adjustments are not made to improve the usage of variable resources in terms of reducing costs and/or increasing gross income. A detailed investigation into details of such component parts will definitely help in identifying the necessary adjustment needed to correct the situation. The operating ratio for the small and large farms are shown in Tables 4.30 and 4.31.

Table 4.30: The operating ratio (group 1).

Farm No	Flock Size (Birds)	Gross Income (₦)	Total Operating Expenses	Operating Ratio
1	100	9975	4883	0.49
2	100	8820	9792.5	1.11
3	100	8425	5683	0.67
4	150	16280	11520	0.71
5	200	18335	8225.5	0.45
6	200	18500	16280	0.88
7	200	19600	10175	0.52
8	270	21320	222939	1.07
9	300	21680	22795	1.05
10	320	23920	17540	0.73
			Average	0.57

Source: Calculated from survey data.

Table 4.31: The operating ratio (group 2).

Farm No	Flock Size (Birds)	Gross Income (₦)	Total Operating Expenses	Operating Ratio
11	400	44400	23540	0.53
12	400	40200	39141.5	0.97
13	500	34230	17051	0.50
14	500	37840	23435	0.62
15	500	40500	37520	0.93
16	1000	75200	47451	0.63
17	1000	68460	35285	0.52
18	1500	126630	109576	0.87
19	2020	170730	115705	0.68
			Average	0.69

Source: Calculated from survey data.

Table 4.32: Average operating ratio for the two groups.

Groups	Average operating ratio
GR 1: The Small Scale Farm	0.57
GR 2: The Large Scale Farm	0.69

Source: Calculated from survey data.

Table 4.33: Test of statistical significance in operating ratio between the two groups

Groups	Calculated	Tabulated 't'		D.f.	Remarks
		5%	1%		
1 and 2	0.18	2.110	2.898	17	Not significant

Source: Calculated from survey data.

From Tables 4.30 and 4.31, it can be seen that the operating ratio is 0.55 and less for the good farms and is greater than 1 in all farms that are operating at a loss. This means that in those farms operating at a loss, the gross income does not cover the operating expenses and hence to rescue these farms the operating ratio must be drastically reduced for the farms to continue in production.

In general, there is not much difference in the value of operating ratios of the small and large firms. The overall operating ratios for all farms is found to be about 0.72, which means about 72 percent of the gross income in broiler production goes towards the servicing of operating expenses. The operating ratio is expected to go down with increase in flock size.

It has been observed that as long as the farms are using similar inputs, and from the same source, at the same costs and selling their products at the

same market, the operating ratios may not differ significantly. It would only differ at very large flock population due to the effect economies of scale.

#### 4.14 Fixed Ratio

The fixed ratio indicates the percentage of the gross income accruing to the fixed inputs. It is an ex-ante decision tool, i.e. an important parameter used after and not during the production period. The fixed ratio (FR) is the total fixed costs (TFC) divided by the Gross Income.

$$FR = \frac{TFC}{GI}$$

If the fixed ratio is close to 1, it means some of the fixed resources are either left idle or under utilised. However, in the event that these resources are fully utilised, a high fixed ratio might be due to a farmer's over-estimation of the expected gross returns in his choice of enterprise or due to unpredicted biological condition militating against output.

Table 4.34: The fixed ratio(group 1: small farms).

Farm No	Flock Size (Birds)	Gross Income (N)	Total Operating Expenses	Fixed Ratio
1	100	9975	242	0.02
2	100	8820	273.3	0.03
3	100	8425	377.2	0.03
4	150	16280	155.6	0.04
5	200	18335	738	0.01
6	200	18500	1698.6	0.09
7	200	19600	583.3	0.03
8	270	21320	1181.9	0.06
9	300	21680	906	0.04
10	320	23920	700	0.03
			Average	0.04

Source: Calculated from survey data.

Table 4.35: The fixed ratio ( group 2 : the large farms).

Farm No	Flock Size (Birds)	Gross Income (N)	Total Operating Expenses	Fixed Ratio
11	400	44400	498.6	0.01
12	400	40200	778.6	0.02
13	500	34230	772.6	0.02
14	500	37840	600	0.02
15	500	40500	854	0.02
16	1000	75200	1500	0.02
17	1000	68460	695	0.01
18	1500	126630	3667	0.03
19	2020	170730	4334	0.03
			Average	0.02

Source: Calculated from survey data.

Table 4.36: Average fixed ratio for the two groups.

Groups	Average fixed ratio
GR 1: The Small Scale Farm	0.04
GR 2: The Large Scale Farm	0.02

Source: Calculated from survey data.

Table 4.37: Test of statistical significance of difference in fixed ratio between the two groups.

Groups	Calculated	Tabulated 't'		D.f.	Remarks
		5%	1%		
1 and 2	0.38	2.110	2.898	17	Not significant

Source: Calculated from survey data.

The fixed ratio for the two groups of farms under study are shown in Tables 4.34 and 4.35. From the figures, it is seen that the fixed ratio is very low and negligible. This may be due to the fact that in farm management studies of

this type, the depreciated value of fixed inputs is used rather than their real value because it is their contribution towards the production at a particular period rather than their overall value that is considered. Similarly, poultry production has been found to be affected more by variable inputs rather than fixed inputs.

There are not many observable differences between the fixed ratio in the large and small farms because as stated above (Table 4.37) the depreciated value using a straight line depreciation is used here. The fixed ratio is less than 5% on the overall average in all the farms, which indicate a very low contribution of fixed resources in the broiler production enterprise.

CHAPTER FIVE

SUMMARY, FINDINGS, CONCLUSIONS  
AND RECOMMENDATIONS

5.1 Summary

An attempt is made in this study to determine costs and returns together with the factors that determine efficiency in broiler production in the study areas under the present economic conditions and to suggest ways and means of improving the performance of this subsector.

In order to achieve these objectives, various efficiency measures of financial success were analysed. These principally include, the net farm income (NFI) analysis, the analysis of the efficiency factors like the returns to various factors of production such as labour, management and capital. It also involves the analysis of ratios like the gross, the operating ratio and the fixed ratio all of which are measures of determining the success or otherwise of a production system.

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5.2 Findings

- (i) The net farm income is the central measure of overall financial success of a farm. In the study it was found that the net farm income increases with scales of production, i.e. the larger farms have higher net farm income than the smaller ones and it is affected by economies of scale. The difference between the two groups of large and small scale producers in terms of NFI have been tested and found to be statistically significant. The NFI was found to be positive in most farms.

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- (ii) The returns to factors of production has also been studied and it was found that the return to labour and management are generally very low in small farms when compared to larger farms.
- (iii) The return on capital for the various farms is not found to differ significantly. It is however seen to be related to efficiency of management, farm with excellent management are found to record higher return on capital. For a good return to capital also, there should be a good capacity utilisation of farm structures. A lot of wastage is recorded by farmers in terms of capacity under utilisation which in the long run affects the survival of their broiler production businesses. The average return on capital in the study area is about 45% which is higher than the current lending rate of 21%.
- (iv) The gross ratio which measures the ultimate solvency of farms was analysed and it was found that the ratio does not differ significantly between small and large farm at lower level of production. This has been found to be due to the domination of a common input - "feed" which accounts for about 70 percent of the production costs. Hence, as long as the broiler farmers use the same feeds, obtained from the same market, their gross ratio may not differ no matter the scale of production. They can, however, improve it by lowering cost through direct self production of feeds. The ratio is found to be about 0.60 for broiler farms (in the area of study) which is still good.
- (v) The operating ratio was similarly computed. It shows the gross income that goes to pay for the operating costs. The average ratio for the area is

0.72 i.e. 72 percent, which is high. There is also no significant difference in terms of the operating ratio for the various classes. This is connected to the fact that all the producers obtained the inputs from a common market. It is however, lowered at a very high scale of production.

- (vi) There are not many observable differences between the fixed ratio of the two classes of producers studied. They are all under 5 percent. Since it measures the amount of gross income that goes to service fixed resources, we can say the figure is quite low and that the broiler production industry is generally at its rudimentary stage with no high fixed costs components.

### **5.3 Conclusions**

It can be concluded that broiler production, despite the current decline being experienced in the subsector, is still a profitable venture when indicators like the Net Farm Income and Returns to Factors of production such capital and management are considered. What is needed is to devise ways and means of improving the efficiency of the production system to enable the producer realise more income and profit from his investment to offset the current high inflationary trend being experienced in the country.

### **5.4 Recommendations**

- i) The government should provide the broiler farmers with more supportive incentives in terms of soft loans, good sources of vaccines at cheap price etc. to enable the farmers to break from small-scale production to large one. This will enable the farmers to reap the advantages of economies of

scale (which lowers production costs) and ultimately the final price of the birds. This will enable the broiler farmers to produce the birds at cheaper prices affordable to the common man and thereby increase the demand for broilers since the lower the price the higher the demand, *ceteris paribus*.

- (ii) There should be more scientific researches with the aim of providing broiler birds with excellent performance in terms of feed conversion efficiency, growth potential and disease resistance.
- (iii) There should be more scientific researches into ways of finding cheaper sources of feeds to reduce competition between birds and man. Feeds cost constitute about 70% of the total production cost in broiler production, lowering feed costs would definitely lower production cost significantly.
- (iv) There should be more extension work to impart more knowledge to the farmers on the skills and techniques of modern poultry management which would enable them survive and make more profits.

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APPENDIX

THE ECONOMICS OF BROILER PRODUCTION

SECTION A

1. Name of Enterprises: .....
2. Location: .....
3. Type of Housing: .....
4. Estimated value of Housing (N): .....
5. Total Number of Equipment (waterers, feeders, etc.) .....
6. Estimated Value of Equipment (N) .....

SECTION B

WEEK 1

1. Number of day old chicks purchased: .....
2. Date of purchase .....
3. Cost of day old chick (N) .....
4. Total cost of day old chicks (N) .....
5. Amount of feeds consumed (bags): .....
6. Price of feed per bag (N): .....
7. Total cost of feed consumed: .....
8. Total cost of medication given (N): .....
9. Total cost of utilities (water, kerosine, etc.): .....
10. Total cost of labour (N): .....
11. Mortality recorded: .....

WEEK 2

1. Number of birds: .....
2. Amount of feeds consumed (bags): .....
3. Price of feed per bag (N) .....
4. Total cost of feed consumed (N): .....
5. Total cost of medication given (N) .....
6. Total cost of utilities (water, kerosine, etc.) .....
7. Total cost of labour (N) .....
8. Mortality recorded: .....

**WEEK 3**

1. Number of birds: .....
2. Amount of feeds consumed (bags): .....
3. Price of feed per bag (₱) .....
4. Total cost of feed consumed (₱): .....
5. Total cost of medication given (₱) .....
6. Total cost of utilities (water, kerosine, etc.) .....
7. Total cost of labour (₱) .....
8. Mortality recorded: .....

**WEEK 4**

1. Number of birds: .....
2. Amount of feeds consumed (bags): .....
3. Price of feed per bag (₱) .....
4. Total cost of feed consumed (₱): .....
5. Total cost of medication given (₱) .....
6. Total cost of utilities (water, kerosine, etc.) .....
7. Total cost of labour (₱) .....
8. Mortality recorded: .....

**WEEK 5**

1. Number of birds: .....
2. Amount of feeds consumed (bags): .....
3. Price of feed per bag (₱) .....
4. Total cost of feed consumed (₱): .....
5. Total cost of medication given (₱) .....
6. Total cost of utilities (water, kerosine, etc.) .....
7. Total cost of labour (₱) .....
8. Mortality recorded: .....

**WEEK 6**

1. Number of birds: .....
2. Amount of feeds consumed (bags): .....
3. Price of feed per bag (₱) .....
4. Total cost of feed consumed (₱): .....
5. Total cost of medication given (₱) .....

6. Total cost of utilities (water, kerosine, etc.)
7. Total cost of labour (N) . . . . .
8. Mortality recorded: . . . . .

WEEK 7

1. Number of birds: . . . . .
2. Amount of feeds consumed (in bags): . . . . .
3. Price of feed per bag (N). . . . .
4. Total cost of feed consumed (N): . . . . .
5. Total cost of medication given (N). . . . .
6. Total cost of utilities (water, kerosine, etc.)N
7. Total cost of labour (N) . . . . .
8. Mortality recorded: . . . . .
9. Number of birds sold: . . . . .
10. Price per bird (N). . . . .
11. Total value of birds sold (N). . . . .

WEEK 8

1. Number of birds: . . . . .
2. Amount of feeds consumed (in bags): . . . . .
3. Price of feed per bag (N). . . . .
4. Total cost of feed consumed (N): . . . . .
5. Total cost of medication given (N). . . . .
6. Total cost of utilities (water, kerosine, etc.)N
7. Total cost of labour (N) . . . . .
8. Mortality recorded: . . . . .
9. Number of birds sold: . . . . .
10. Price per bird (N). . . . .
11. Total value of birds sold (N). . . . .

WEEK 9

1. Number of birds: . . . . .
2. Amount of feeds consumed (in bags): . . . . .
3. Price of feed per bag (N). . . . .
4. Total cost of feed consumed (N): . . . . .
5. Total cost of medication given (N). . . . .

6. Total cost of utilities (water, kerosine, etc.) ₦ .....
7. Total cost of labour (₦) .....
8. Mortality recorded: .....
9. Number of birds sold: .....
10. Price per bird (₦) .....
11. Total value of birds sold (₦) .....

**WEEK 10**

1. Number of birds: .....
2. Amount of feeds consumed (in bags): .....
3. Price of feed per bag (₦) .....
4. Total cost of feed consumed (₦): .....
5. Total cost of medication given (₦) .....
6. Total cost of utilities (water, kerosine, etc.) ₦ .....
7. Total cost of labour (₦) .....
8. Mortality recorded: .....
9. Number of birds sold: .....
10. Price per bird (₦) .....
11. Total value of birds sold (₦) .....

**WEEK 11**

1. Number of birds: .....
2. Amount of feeds consumed (in bags): .....
3. Price of feed per bag (₦) .....
4. Total cost of feed consumed (₦): .....
5. Total cost of medication given (₦) .....
6. Total cost of utilities (water, kerosine, etc.) ₦ .....
7. Total cost of labour (₦) .....
8. Mortality recorded: .....
9. Number of birds sold: .....
10. Price per bird (₦) .....
11. Total value of birds sold (₦) .....

**WEEK 12**

1. Number of birds: .....
2. Amount of feeds consumed (in bags): .....

3. Price of feed per bag (₦) .....
4. Total cost of feed consumed (₦): .....
5. Total cost of medication given (₦) .....
6. Total cost of utilities (water, kerosine, etc.) ₦ .....
7. Total cost of labour (₦) .....
8. Mortality recorded: .....
9. Number of birds sold: .....
10. Price per bird (₦) .....
11. Total value of birds sold (₦) .....