

**THE STRUCTURE AND IMPORTANCE OF THE COMMERCIAL AND VILLAGE
BASED POULTRY INDUSTRY IN NIGERIA**

FAO (ROME) STUDY

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LIST OF ABBREVIATIONS

ABU	Ahmadu Bello University
CDC	Center for Disease Control, USA
DFID	Dept for International Development
DOC	Day old chicks
EU	European Union
FAO	Food and Agricultural Organisation
FVM	Faculty of Vet Medicine
GDP	Gross Domestic Product
GoN	Government of Nigeria
GPS	Grand Parent Stock
HPAI	Highly Pathogenic Avian Influenza
IBAR	Inter-African Bureau on Animal Resources of AU
LGA	Local Government Area
LIDP	Low Inputs Dependent Production
ND	Newcastle disease
NBS	National Bureau of Statistics
NVMA	Nigerian Veterinary Medical Association
NVRI	National Veterinary Research Institute
PACE	Pan African Programme for Control of Epizootics
PAN	Poultry Association of Nigeria
PS	Parent Stock
SAP	Structural Adjustment Programme
TCP	Technical Cooperation Project
USAID	United States agency for International Development
UI	University of Ibadan
WHO	World Health Organisation
WPSA	World Poultry Science Association

CHAPTER ONE

1. INTRODUCTION

1.1 Background Information

Agriculture continues to be the most important sector of the Nigerian economy in terms of provision of employment in spite of its declining contribution to the nations foreign exchange earnings. About 65% of Nigerians are estimated to depend on agriculture for their livelihood while 34.8% of the GDP and over 38% of the non-oil foreign exchange earnings, are contributed by the agricultural sector.

Agriculture contributed an estimated 32% of Gross Domestic Product (GDP) in 1998 to the Nigerian economy. An estimated 35.2% of the labour force was employed in the sector in that year. The principal cash crops are cocoa (which accounted for only 0.7% of total merchandise exports in 1995), rubber and oil palm. Staple foods include rice, maize, taro, yams, cassava, sorghum and millet. Timber production, the raising of livestock (principally goats, sheep, cattle and poultry), and artisanal fisheries are also important. According to World Bank estimates, agricultural GDP increased at an annual rate of 2.9% in 1990-98. The sector remains the largest contributor to the Nigerian economy, accounting for over 38% of the non-oil foreign exchange earnings, and employing about 70% of the active labour force of the population. Although, the sector has suffered much neglect by the Federal Government since the discovery of petroleum in commercial quantity in 1958, but its importance cannot be over emphasized in the Nigerian economy.

The poultry sub-sector is the most commercialised (capitalised) of all the sub-sectors of the Nigeria's agriculture. There is however no comprehensive data on the sub-sector; thus making proactive intervention and planning in the sub-sector due to lack of accurate information or current data.

With the global spread of Highly Pathogenic Avian Influenza (HPAI) across several countries since 2003 and especially, the confirmation of the epidemic in Nigeria in February 2006, there is a new attention focussed on the sub-sector by the Government of Nigeria (GoN) and the international community. As part of this new initiative, FAO intends to collate the available current information in order to provide an overview of the poultry sub-sector in Nigeria. This report titled "**The Structure and Importance of the Commercial and Village Based Poultry Industry in Nigeria**" is prepared for this purpose.

1.2 Scope of Study and Terms of Reference

This study was designed to be a desk review of the poultry sector in Nigeria. It was to be used for further investigation on, either the epidemiology of Avian Influenza and/or other poultry diseases and their socio-economic impact. The report emanating from the study, based on statistical data, reports, literature information and interviews with key

stakeholders, is to provide a 5-year overview of developments in the poultry sector. It includes a review of the structure of different poultry production systems; husbandry practices, poultry health measures; evolving marketing chains; the role of poultry in rural livelihoods and household food security, and policy/economic factors which have contributed to changes in the sector.

The detailed terms of reference is presented in Appendix 1

1.3 Data Sources, Collection Approach and Analysis

The data for this study were collected mostly from secondary sources. The sources include: Federal Livestock and Pest Control Department, National Bureau of Statistics, Poultry agro-industrial entities, selected or representative rural poultry keeping households, as well as institutional sources of published and unpublished documents, etc. Data collection was guided with checklists of information that were designed to elicit information to meet the terms of reference. In selected cases, complementary data were actively sourced through interviews with stakeholders.

The data analyses were both qualitative and quantitative. Quantitative analysis and extrapolations were carried out wherever possible to provide information on the structure and size of the operations in the poultry sub-sector.

1.4 Limitations and Constraints

The major limitation is paucity and in some cases, the accuracy of information, which can provide a comprehensive overview of the poultry sub-sector. The Federal Livestock and Pests Control Department has not carried out any nation-wide survey of the sub-sector in recent years. The National Bureau of Statistics, until 2005, had not conducted any survey on the sector for several years. In addition, the year-2005 survey, which covered the sub-sector and is still being processed, has significant gaps arising from lack of appropriate inputs from poultry subject matter experts and socio-economists. Thus as much as possible, proxy variables were used to obtain indicative quantitative overview of the sub-sector. It therefore became crucial to cross-integrate data from other related sources to achieve improved accuracy. These were also combined with information obtained from experts and operators in the sub-sector to develop this report. Nigeria is a very extensive country which demands equally extensive travels to reach data sources. The lack of e-data sources further compelled physical contacts directly or through proxies in the diverse and country-wide locations.

In spite of these, this exercise has generated very considerable data and yielded a very good and full overview of the poultry sub-sector. In the report wherever necessary, the specific data requirements for the future are highlighted and suggestions or justifications are made to guide such future contingencies.

1.5 Layout of the Report

This report is presented in eight chapters. The introduction to the report is presented in Chapter One. Chapter Two is devoted to providing an overview of commercial and rural

poultry production in Nigeria while chapter three provides an indication of the importance of poultry in household food security in Nigeria. Information on the marketing of poultry inputs, products and services is presented in chapter four while the support programmes for poultry industry is presented in chapter five. An overview of health issues and HPAI in Nigeria's poultry is addressed in chapter six while the bibliography of recent studies on poultry in Nigeria is covered in chapter seven. The conclusions and recommendations of this report are presented in chapter eight which is followed by cited literature and the Appendix.

CHAPTER TWO

2. OVERVIEW OF POULTRY PRODUCTION IN NIGERIA

2.1 Preamble

The types of poultry that are commonly reared in Nigeria are chickens, ducks, guinea fowls, turkeys, pigeons and more recently ostriches. Those that are of commercial or economic importance given the trade in poultry, however, are chickens, guinea fowls and turkeys, amongst which the chickens predominate.

2.2 Description of the Main Characteristics of the Different Production Systems

There are two distinct poultry production systems in Nigeria, as in most developing countries of Africa and Asia. Each of these two systems is associated with features of scale, stock, husbandry and productivity that therefore define the two distinct production systems. The two systems are conventionally referred to as the Commercial Poultry and the Rural Poultry, respectively. The Commercial Production System as the name implies is industrial in its prototype and therefore based on large, dense and uniform stocks of modern poultry hybrids. It is capital and labour intensive; as well as inputs and technology demanding. On the other hand, the Rural Poultry is by convention a subsistence system which comprises stocks of non-standard breeds or mixed strain, types and ages. It is generally of small scale, associated with household or grass root tenure and little or no veterinary inputs. The rural poultry sector is therefore in its original sense, a village-based, household or individual holding and occupation which has however been extended to non-village settings in peri-urban localities, mainly by the middle class dwellers. The common features to all these intermediate grades are in their subsistence scale generally, with minimal or no inputs and labour overheads.

However, between these two rather distinct prototypes, intermediate grades have evolved over time, in response to the national agro-economy and consumer demands. Thus as can be seen later from existing statistical data and from findings in the current review of poultry sector, intermediate grades which constitute what has now been globally tagged “Family Poultry” is comprised of the rural or indigenous poultry types in some cases or a mixture of both indigenous and exotic hybrids or even totally exotic breeds.

Available information shows that the scale of operation can range from stocks of a few units or a few dozens of a variety of poultry birds (species) in the household poultry to tens or hundreds of thousands of chickens in the grades of commercial poultry. These two distinct production scales and systems as well as the range of the intermediate types have been conveniently grouped (FAO) into four operational sectors, viz:

- Sector 1: Industrial Integrated System with high bio-security systems.
- Sector 2: Commercial Poultry Production System with moderate to high bio-security systems
- Sector 3: Commercial Poultry Production System with low to minimal bio-security systems
- Sector 4: Village or backyard Production with minimal bio-security.

It is implied therefore that Sectors 1 to 3 cover grades of intensive and or commercial poultry production systems, while Sector 4 embraces types and scales of village or family subsistence but mostly extensive poultry production. The major features of these operational sectors are shown in Table2.1.

Table 2.1: Major Features of the Four Production Sectors

MAJOR FEATURES	SECTOR 1	SECTOR 2	SECTOR3	SECTOR 4
Integration Scale	High & Full	Medium	Minimal/Nil	Nil
<ul style="list-style-type: none"> • Grand Parent Stock • Parent Stock • Hatcher • Intensive system • Mixed species 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ x 	<ul style="list-style-type: none"> x x x ✓ x 	<ul style="list-style-type: none"> x x x ✓ x 	<ul style="list-style-type: none"> x x x x ✓
Inputs Scale				
<ul style="list-style-type: none"> • Own Feed mill • Own electricity • Own water system • OwnVet vacc&drugs 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ 	<ul style="list-style-type: none"> ✓ ✓/x ✓/x ✓/x 	<ul style="list-style-type: none"> x x x x 	<ul style="list-style-type: none"> x x x x
Biosecurity Scale				
<ul style="list-style-type: none"> • Perimeter fence-guard • Specified housing • Movement restriction • Staff Hygn,showering • Facility Equip hygiene • All-in all-out site 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓/x ✓ ✓/x 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓/x ✓ ✓/x 	<ul style="list-style-type: none"> ✓ ✓/x ✓/x x ✓ ✓/x 	<ul style="list-style-type: none"> x x x x x x
Products				
<ul style="list-style-type: none"> • Parent stock DOC • Comm DOC • Table eggs per farm • Meat or broiler 	<ul style="list-style-type: none"> ✓ ✓ ✓/x ✓/x 	<ul style="list-style-type: none"> x x ✓✓ ✓✓ 	<ul style="list-style-type: none"> x x ✓✓ ✓ 	<ul style="list-style-type: none"> x x ✓ ✓
Further Processing	✓/x	✓/x	x	x
Economic roles				
<ul style="list-style-type: none"> • Labour generating scale • Import & Export • Rural / Culture Impact 	<ul style="list-style-type: none"> ✓✓✓ ✓✓ ✓ 	<ul style="list-style-type: none"> ✓✓ ✓ ✓ 	<ul style="list-style-type: none"> ✓ x ✓/x 	<ul style="list-style-type: none"> x x ✓✓

It is therefore implicit that the Integrated Commercial Sector 1 features a maximum bio-security level as the complement to the management and operational demands for the GPS, PS and Hatchery which are the key components of the Sector. By extrapolation the Sectors 2 and 3 represent high and medium levels of commercial poultry production, which typically do not involve GPS, PS and Hatchery but consist of intensive commercial scale of eggs and broiler production from chickens. In very few instances, some limited and seasonal turkey productions are included in the Sector 3. From observation, it seems that a capacity base line of 20,000 and 1000 chickens can be applied for Sectors 2 and 3 respectively. The upper scale for sector 2 is up to 500,000, in a few instances.

2.2.1 Structure of the Commercial Poultry in Nigeria

Within the three operational sectors, which constitute the commercial system of poultry production, the Industrial Integrated Sector occupies the apex position, which by virtue of the possession of GPS and PS serves as the foundation to the entire commercial production system. In conformity with global trends in poultry industry, this foundation is based on very few fully and vertically integrated holdings, dictated by capital and technical facilities, which are implicit in that level within the system. For these reasons, most of the eight or so of such operations on PAN'S list in Nigeria are rooted on foreign franchise or joint venture or with links in Europe. The list and production profile of Nigeria's poultry foundation stock (GPS & PS; Sector 1) are shown in Table 2.2.

Table 2.2. List of GPS / PS / Hatchery Companies (Foundation Stock)

S/No.	Company	Products
1.	Obansanjo Farms Nig. Ltd., Ogun State	1. PS-DOC, 2. Equipment, 3. Broiler DOC, 4. Pullet DOC, 5. Frozen chicken, 6. Cockerels
2.	CHI Ltd (AJANLA FARMS) Oyo State, Farm HQ. Lagos State.	1. PS D.O. Chicks, 2. POL pullets, 3. Boiler DOC, 4. Emus, 5. Pullet DOC, 6. Equipment, 7. Table eggs, 8. Drugs, 9. Cockerels
3.	AVIAN SPECIALITIES Ltd, Oyo State.	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Cockerels
4.	ZARTECH FARMS, Oyo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen Chicken, 5. Further Processed Chicken, 6. Cockerels
5.	AMO FARMS, Oyo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Feeds, 5. Cockerels
6.	TUNS FARMS, Oshun State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Feed concentrates, 5. Cockerels
7.	LIPAKALA FARMS, Ondo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Dressed chicken
8.	S & D FARMS, Ogun State	1. P/S DOC, 2. Broiler DOC, 3. Pullet DOC, 4. Eggs, 5. Dressed chicken, 6. Cockerels
9.	NIYYA FARMS Ltd. Kaduna State	1. Day old chicks, 2. Eggs

Although the precise value of Nigeria’s Integrated GPS and PS poultry stock is unavailable, the estimated stock value at that level from a summary of the size of the Sector (Table 2.3) is over N3.5 billion with an annual projected production worth over N13.59billion. These exclude the costs of overheads, hardware and other inputs, especially feeds and feeding costs which are integral to the operation of the sector.

2.2.1.A: Production Capacity (Pre - HPAI Epidemic) PAN.

The data available from the Poultry Association of Nigeria (PAN) on capacity of the commercial are as follow:

Table 2.3: Grand Parent Stock (GPS) and Parent Stock (PS) Capacity

A.1: Grand Parent Stock (GPS)

Heavy Breeds	46, 000	1, 308,125 PS/year
Light Breed	33,000	1, 543.750 PS/year

A.2: Parent Stock (PS)

	Broiler PS	Black layer PS	Brown layers PS
Confirmed Fig.	885,500	311,500	287,000
Unconfirmed Fig.	88,550	31,150	28,700
TOTAL	974,050	324,650	315,700

NB: Estimated cost of mature GPS = N3000; mature PS = N2000 per unit

B: Housing and Husbandry Practices

The housing and husbandry practices for GPS and PS in Nigeria, follows the conventions in tropical intensive open-sided deep litter housing and poultry management. The specifications for housing include concrete core flooring; 2 to 3 feet dwarf perimeter walls with chicken wire mesh sides and roofs of corrugated asbestos or galvanised sheets. Although this is a design which is relatively cheaper than the closed and environmentally controlled designs in temperate countries, it exposes poultry stock to the impacts of direct vagaries of climate and weather with negative consequences on the productivity and health of stock. The daily variations in temperature and relative humidity in parts of Nigeria can reach 12⁰ C or more and 25 % respectively. These unfavourable circumstances have therefore, in some instances, compelled the incorporation of environmental amelioration systems like industrial or tunnel ventilator fans, foggers and cooling pads along with shade trees planting. In recent times, one of the major (integrated) operators in this sector, which is located in the South-West Nigeria, introduced custom built closed environmental housing, thus blazing the trail in this innovation.

The watering and feeding systems for poultry in this Sector are either the manual trough or bucket types. However in the more advanced integrated holdings, automated chain feeding and watering systems are involved. Egg collection is mainly based on manually operated nest boxes with straw or wood shaving floors. Although the man-labour to stock

ratio can be 1: 1000 for GPS and PS, the degree of automation brings the ratio down by even 50% or more.

C: Hatchery Capacity

Although nine hatchery producers are listed in PAN's record (Table 2.2), there are certainly a few other medium to small scale or limited hatchery producers in Nigeria. Examples of such unlisted hatcheries are :

1. The Mayfield Hatchery, Ajah, Lagos
2. Akpata Hatchery, Epe Rd, Lagos
3. Alanco Farms Hatchery, Abeokuta
4. Farm FenderH Hatchery, Ilishan, Ogun
5. NAPRI Hatchery, Shikka Zaria
- 6.. Kaduna hatcery

Majority of these hatcheries are active, each producing tens- or hundreds of thousands of chicks weekly while a minority (e.g. Kaduna) have closed down production. In the circumstance, PAN's data will realistically represent the elite and perhaps 70% component of the Integrated Sector.

D: Disease Control and Poultry Health Practices in GPS and PS

All GPS and some of the PS used in Nigeria are sourced from Western Europe, especially Holland, Belgium, UK and Israel; and possibly in recent times, from franchise links in Egypt. There are therefore two main theoretic sources of diseases in this Sector, viz:

- a. Diseases that accompany foundation stocks vertically, via genetic and ovarian channels. The examples are: Luekosis, Salmonellosis, and Mycoplasmosis
- b. Diseases that reach stock locally via horizontal spread. These are in the majority and include examples like: Marek's disease, Newcastle disease, Fowl cholera, and Colibacillosis .

The spread of the current Avian influenza epidemic across continents opens a new dimension to the epizootiology of horizontally transmissible disease problems in poultry. However, none of the foundation stocks (Sector 1) in Nigeria has so far been affected by the disease.

Generally speaking, the control of diseases in the entire poultry industry has a lot to do with the bio-sanitary status of the foundation stocks and hatcheries. This is particularly so, with the vertically transmitted diseases that are difficult to control, except by ensuring that foundation stocks are free *ab-initio* from such diseases. The control strategy for such diseases in Sector 1 is to obtain statutory guarantees (certificates) of freedom of stock from such diseases, from importing countries. As for the horizontally spread diseases, it is the scope and intensity of the local (farm) bio-sanitary / bio-security measures that determine disease prevention and control efficiency. The components of such measures are in three major groups:

Management and Hygiene practices.

These cover the range of measure and practices that harness the merits of good housing, feeding and husbandry standards, including all-in-all-out system to protect stock from disease predisposing factors, especially stress. It also specifically entails the application of daily hygienic precautions concerning the environment, utensils, stock and handlers, through standard cleansing and disinfection, to reduce (possibly exclude) the contamination of environment and stock by primary and secondary microbial/disease agents. The enforcement of operational guidelines like the restriction of human and vehicular movements, etc fall under this area. The objective is to

keep out infections and minimize the need for medication. Observance of these practises appear to vary widely in Nigeria, from optimal to sub-optimal.

Preventive Medication

Preventive medication or prophylaxis is one of the cornerstones of disease prevention in farm stocks. The practice is to apply medications strategically ahead of predicted period of disease incursion. The risk from horizontal disease spread is high in the typical open-sided poultry housing system in Nigeria. In this regard, most integrated and indeed the whole of the commercial poultry sectors 1, 2 &3, in Nigeria rely on this strategy to reduce disease outbreaks and spread within and between the flocks. The examples of preventive medication are the application of coccidiostats and anthelmintics, periodically in stock (Table 2.4). These two medications are virtually inevitable in GPS and PS in Nigeria because they are conventionally floor- reared in environment, which is very conducive to the propagation of parasites. An extension of the principle of preventive medication, is in the periodic application of antimicrobials / antibiotics which is common in Nigeria’s poultry, to minimise the progression of bacterial infections into clinical diseases. This is a controversial practice that is capable of encouraging the development of antibiotic resistance, especially as the practice can be open to abuses by farmers.

Table 2.4: Typical Preventive Medication for Disease Prevention in Poultry

Day 0 -1	First 24 hours, glucose in water
Day 3 -5	Supplementary Vitamins in water of feed
Week -2	Anti-CRD; Broad Spectrum antibiotics
Weeks 3, 6, 10. POL	Coccidiostat in water OR in feed for week 2 to
Weeks 5, 7, 12	Anthelmintic
Every 2 weeks	Vitamins as anti-stress
Every 2months	Preventive antibiotics

In Nigeria, the spate of such antibiotic resistance problems has caused some of the integrated operators to resort to the monitoring of such medications through periodic antibiograms. It is noteworthy that the greater bulk of the antibiotics are sourced through importation.

Vaccination

There is an established practice of vaccine application for disease prevention in Nigeria’s poultry industry. There are two major sources of vaccine supplies to Nigeria’s poultry industry, viz:

1. NVRI, Vom
2. Import

From a short list of about five vaccines in the 1980s, the range and volume of poultry vaccines have nearly trebled in recent times. Although the local production at NVRI has continued to expand in response to demand, it would appear that the demand has remained above the production by NVRI in terms of range and volume, (Table 2.5). In the circumstance, the poultry industry is compelled to supplement through importation of the needed range and volume. It

would appear that many of the integrated Sector 1 operators depend on supplementary importation and thereby also create a vaccines market for Nigeria's poultry.

The implications of such a sizable dependence on imported vaccines, including those associated with heterologous imported strains, have been explained by Adene (2004). The typical vaccination schedule in integrated foundation stock is represented in Table 2.6.

Table 2.5 NVRI: Poultry Viral Vaccines (Doses)

Year	VIRAL	FTV	FCV
1985	59,795,000	1,341,050	303,250
1995	-	487,100	290,800
2001	36,703,800	260,200	328,000
2002	35,248,200	1,828,700	943,600
2003	56,273,200	1,360,100	1,083,200
2004	86,453,300	3,075,700	1,128,700
2005	108,811,800	108,811,800	1,808,100
2006	-	276,400	981,600

Table: 2.6. Typical Vaccination Programme for Parent Stock

Week 1	ND-H (i/o; spray...)
Week 2	Gumboro dis Vacc (live) ; Bronchitis (high passage)
Week 4	F.Pox Vacc Week 5; Bronchitis booster (low pass)
Week 6	ND –K or booster
Week 8 -10	F.Cholera Vacc; Coryza Vacc
Week 14	Gumboro dis booster vac; EDS Vacc
Week 16	ND –K or KOEV booster; AIE Vacc
Week 35	Gumboro dis Vacc booster
Week 37	ND –K or KOEV booster vac
NB:	Anti-coccidial vaccines have recently been introduced during week 2-4

The deciding consideration or vaccination strategy in the Sector is to achieve a meaningful level of vertically integrated transfer of immunity to DOC- offsprings.

E.Poultry Products

Within the context of Sector 1 as the Integrated Commercial Poultry, the products range from mainly PS DOCs to a combination of PS and commercial DOCs, which include pullet and broiler type DOCs. However, that sector in its broader sense as the Apex Investment, encompasses, other integral complements like poultry housing equipment, feed mills and health inputs as well as facilities for further processing of poultry for meat. The range and outlay in this sector is represented in Tables 2.7.a & b. The layer breeds that are being supplied into the market by these GPS and PS hatchery companies are black (Nera Black and Harco Black), brown (Isa Brown, Amo Brown, Swiss Brown and Babcock) and white (Hyline) for layers while the broiler breeds include Anak, Abor and Cobb.

Table 2.7a. List of GPS/PS/Hatchery Companies

S/No.	Company	Products
1.	Obansanjo Farms Nig. Ltd., Ogun State	1. PS-DOC, 2. Equipment, 3. Broiler DOC, 4. Pullet DOC, 5. Frozen chicken, 6. Cockerels
2.	CHI Ltd (AJANLA FARMS) Oyo State, Farm HQ. Lagos State.	1. PS D.O. Chicks, 2. POL pullets, 3. Boiler DOC, 4. Emus, 5. Pullet DOC, 6. Equipment, 7. Table eggs, 8. Drugs, 9. Cockerels
3.	AVIAN SPECIALITIES Ltd, Oyo State.	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Cockerels
4.	ZARTECH FARMS, Oyo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen Chicken, 5. Further Processed Chicken, 6. Cockerels
5.	AMO FARMS, Oyo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Feeds, 5. Cockerels
6.	TUNS FARMS, Oshun State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Feed concentrates, 5. Cockerels
7.	LIPAKALA FARMS, Ondo State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Dressed chicken
8.	S & D FARMS, Ogun State	1. P/S DOC, 2. Broiler DOC, 3. Pullet DOC, 4. Eggs, 5. Dressed chicken, 6. Cockerels
9.	NIYYA FARMS Ltd. Kaduna State	1. Day old chicks, 2. Eggs

Table 2.7b Inputs Support Services in Sector 1

S/No.	Company	Products
1.	FEED MASTERS Ltd	1. Poultry feeds, 2. Concentrates
2.	GRAND CEREALS Ltd., Plateau State,	1 Poultry feeds, 2. Concentrates
3.	POULTRY EQUIP FACCO W. AFRICA Ltd.	1. Equipment, 2. Incubators, 3. Turkey projects.
4.	BENDEL FLOUR MILLS Ltd. Edo State	1. Poultry feeds, 2. Concentrates, 3. Drugs
5.	TOP FEEDS Ltd. Delta State	1. Poultry feeds, 2. Concentrates
6.	ANIMAL CARE KONSULT, Ogun State	1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Feed concentrates, 5. Cockerels
7.	NIYYA FARMS Ltd. Kaduna State	1. Day old chicks, 2. Eggs
8.	Several Medium and Small scale holdings Nation-wide	1. Eggs, 2. Feeds, 3. Drugs, 4. Equipment

The full structure of Nigeria's poultry industry, as in other industrialised poultry countries, is complemented by the downstream Sectors 2 and 3, which represent gradations of non-foundation poultry stocks. Although these are conveniently defined by their bio-security frame work, as

stated below, the other crucial determinants such as size and range of products are already shown in Table 2.1.

Sector 2:	Commercial Poultry Production System with moderate to high bio-security systems
Sector 3:	Commercial Poultry Production System with low to minimal bio-security systems

Some of the farms in this Sector are satellites of the sector1 companies, for the marketing of products and surpluses. Such surpluses arise from failure of agents and customers to pick up subscribed products. It is therefore not unusual for the apex companies to create facilities for rearing of as much of such surpluses as possible for the production of eggs and table birds. In other instances, the Apex Companies actually sponsor agents who serve to rear specified quantities of broilers on franchise, to feed their own and other meat processing facilities. However the greater bulk of the farmers in Sectors 2 and 3 are independent farmers who buy DOCs from Sector 1 hatcheries, and rear them for eggs and table broilers through retail markets. A variety of this involves the production of eggs and meats for the fast food outlets. These non-franchise producers source their own capital and operate independent of the apex companies.

Individual operators in these two Sectors produce either eggs or broilers or both. In some cases, turkeys are raised for Christmas and similar seasonal markets. A few of them are quite large with over 250,000 birds and considerable high bio-security and automation. Their poultry stocks enjoy similar disease control measures to Sector 1 except that the vaccination schedules are not meant to achieve vertical integration/transfer of immunity. Many of them have their own feed mills and produce qualitative and cost-effective nutrition to their stocks. However, most of those in sector 3 which represent the lowest level of commercial poultry are not as sufficient in inputs like feeds and disease control tools. While all the members of Sector 1 and the majority of those in Sector 2 maintain a complement of Poultry Veterinarians and Nutritionists, the operators in Sector 3 depend at best on occasional consultations with such professionals. This partly explains why their bio-security compliance is low. They are often compelled by the smallness of scale and economy to patronise sub-standard veterinary inputs (e.g. vaccines without cold chain storage) or even skip some health inputs.

The marketing and pricing structure for the two sectors, take their cue from those in Sector 1. The bigger operators in sector 2 actually compete with Sector 1 for a share of markets and pricing while the other extreme represented by the smaller Sector 3 operators is to a large extent restricted to immediate localities as sales outlets. In some cases, products may be sold in this Sector on credit during production gluts precipitated by the bigger operators in sectors 1 and 2.

F.The Number and Spread of Sectors 2 and 3 Operators

There has not been any comprehensive and recent survey of these Sectors. However, available information confirms that the bulk of Sector 2 Operators are based in South-West Nigeria and especially the States nearer to Lagos-industrial capital of Nigeria. In this regard, it is estimated that over 65% of Nigeria's commercial poultry is located in the 5 states of Lagos, Ogun, Oyo, Oshun and Ondo; while another 25 % is based South-South and South-East geo-political zones.

The balance of 10% or less of Nigeria’s commercial poultry is based in the 15 North-Central, North-West and North-East states. Table 2.8 reflects the list of the major operators in Sectors 2. This list is not comprehensive, as it excludes Sector 3 which is composed of numerous small stocks – farms and difficult to be covered in the present study. Indeed, the current exercise reveals that there is a pressing need for a well planned, comprehensive and structured survey of Nigeria’s poultry, starting with the 3 commercial segments.

Table 2.8: Selected Poultry Farms In Sectors 2 and 3

Location	Annual D.O.C. Projection
Lagos State	485,000
Ekiti, Ondo, Delta and Edo States	927,000
Oyo, Osun and Kwara States	791,000
Ogun State	1,060,000
South-South/South-East	1,161,000
Core-North	105,000
Total	4,529,000

φ Please see details in Appendix 2.

2.2.2 Backyard and Rural Poultry (Sector 4)

A. Preamble:

In its conventional sense, this category of poultry is rural (non-urban) in location and subsistent or non-commercial in purpose. However, with decades of appreciation of its position as the true poultry of the non-urban/rural dwellers (i.e. over 70% Nigeria’s population), the socio-economic importance of this category of poultry has been receiving some increasing attention. In the process, the nomenclature in Nigeria and globally, has been evolving to include descriptive and development-friendly terminologies like: *family poultry*, *smallholder poultry*, and *village poultry*. Considering that village poultry is not limited to Africa, the more global picture which takes into account the inclusion of mixtures of exotic and indigenous poultry in parts of Africa and Asia, confers good justification for these new names in this low inputs dependent production (LIDP) system. The effect of national and global attention on this sector over the decades has manifested in various interventions, including the cockerel introduction and exchange programmes, tokens of extension and health input services that have resulted in some changes in the original structure and practices in the system. In which case, the “rural poultry” sector as currently constituted includes isolated pockets of mini-commercial mixed stocks with some inputs into housing and feeding. This version has also enjoyed some patronage from low to middle class peri-urban dwellers who therefore keep pockets of poultry in their backyards.

A previous report by Sonaiya (1990) showed that “the backyard system uses both local and improved breeds. It is a common practice for families to purchase hybrid cockerels or broilers and leave them in the family backyard until needed. With other poultry species such as guinea fowl, pigeons, geese and to some extent ducks and turkeys, the systems of production utilise local birds. This section will therefore focus on conventional rural poultry sector as practiced by the overwhelming majority of rural dwellers. In Africa and especially Nigeria, available data confirm that the rural poultry is in essence household and subsistence farming operation, with minimum stock size, low input system production and equally low off-take capacity.

B. Husbandry Practices

Most of the farmers manage their flocks extensively, allowing the birds the free-range of the village and the surrounding area. Sonaiya (1990) also reported that at the village level in Nigeria, about 65% of respondents did not provide housing in whatever form for their birds thus exposing them to environmental hazards and predators. The chicken are kept mostly by women, for both household consumption and income generation. Usually, the birds are fed some grains and household food remnants in the mornings and are left to roam around the neighbourhood “picking a living”. In the evening they come home to roost in cane baskets, makeshift structures or even trees in compound. There are no current reports on these aspects in Nigeria. In an effort to redress this deficiency, some limited survey-interviews were conducted during this study on the structure of village /household poultry in selected places in the North, West and East of Nigeria. Five families / households per village in selected LGAs were covered in the study. The findings which showed the numbers of the different species of poultry kept by households are presented in the following Tables 2.9 a, b c & d.

Thus in Kano State (North), the household stocks ranged from 5 to 38 for chickens; 0 to 26 for guinea fowls; 0 to 8 for turkeys; 0 to 8 for ducks; and 0 to 11 for pigeons. In Jigawa state (North), the figures were 11 to 49 chickens; 10 to 47 guinea fowls; 0 to 3 turkeys; 3 to 21 ducks and 0 to 131 pigeons. In Oyo state (West) the figures were chickens; guinea fowls; turkeys; ducks and pigeons. While in Enugu (East) they were 59 to 181 chickens; 0 to 18 guinea fowls; 0 to 31 turkeys; 8 to 31 ducks and 0 to 34 pigeons. It will be noticed that the modal figures in some cases are lop-sided; as in the case of Enugu where 3 of the 4 households have no pigeons while the fourth has 34; thus giving the range 0 to 34!

Table 2.9a: Family Poultry Sector: Summary from Household Stocks, Kano State, 2006.

LGAs & VLLGs*	VLLG TOTAL 5 H.HOLDS					H..HOLD AVERAGE				
	Chk	Tky	Dks	G.fwl	Pgns	Chk	Tky	Dks	G.fwl	Pgns
GARKO LGA										
*Lamire	89	0	11	76	0	18	0	2	15	0
*Uta	29	12	29	0	48	6	0	0	3	0
*Danin	37	12	15	49	0	7	2	3	10	0
*Kafin Malamai	55	0	0	40	0	11	0	0	8	0
*Gurjiya	41	0	12	40	0	8	0	2	8	0
DAWAKIN KD										
*Kode	50	2	21	46	0	10	0	4	9	0
*Kantsi	43	2	21	55	0	8	0	4	11	0
*Busaye	59	4	14	55	0	12	0	3	11	0
*Maifawa	36	0	20	12	0	7	0	4	2	0
*Dakatsalle	68	0	0	27	0	13	0	0	5	0

LGAs & VLLGs*	VLLG TOTAL 5 H.HOLDS					H..HOLD AVERAGE				
	Chk	Tky	Dks	G.fwl	Pgns	Chk	Tky	Dks	G.fwl	Pgns
KUMBU TSO										
*Yaushana	44	9	9	14	4	9	2	2	3	1
*Tamburawa	27	7	4	0	16	5	1	1	0	3
*Kureke	38	0	12	51	0	8	0	2	10	0
* Dotsa	50	5	17	34	0	10	1	3	7	0
*Marimari	47	0	10	22	0	9	0	2	4	0
KURA LGA										
*Dan Hassan	99	7	5	19	29	20	1	1	4	6
*Bumkure	63	0	16	15	0	12	0	3	3	0
* Karfi	84	0	40	17	40	17	0	8	3	8
*Imawa	86	0	12	23	55	17	0	2	4	11
* Kasawa	111	9	13	99	0	22	2	2	20	0
DAWKIN TOFA										
*Dawanam	54	15	28	0	30	11	3	6	0	6
*Amariya	96	40	8	38	55	19	8	1	8	11
* Tumfafi	188	4	13	130	0	38	1	2	26	0
*Ganduje	190	6	34	119	0	38	1	7	14	0
*K.Dumawa	107	3	20	52	6	21	0	4	10	1

Table 2.9b: Family Poultry Sector: Summary from Household Stocks, Jigawa State, 2006.

LGAs & VILLGs*	TOTAL FROM 5 H.HOLDS IN VLLG.					PER H.HOLD AVERAGE				
	Chk.	G.fwl.	Dks.	Tks.	Pgns	Chk.	G.fwls.	Dks.	Tks.	Pgns.
GUMEL LGA										
*Gumel Hm.	104	91	36	9	656	21	18	7	2	131
*Zuge	113	179	12	0	24	23	36	2	0	4
*Hammado	117	118	8	0	28	23	24	2	0	6
*Alkakawa	130	268	28	0	0	26	54	6	0	0
*Dawali	96	97	31	2	189	19	19	6	0	38
KAZAURE LGA										
*Hazaure	145	38	25	4	174	29	8	5	1	35
*Gada	146	89	36	0	60	29	18	7	0	12
*Ban Dawa	101	103	28	10	153	20	21	6	2	31
*Dandi	137	94	49	2	24	27	19	10	0	5
*Tsamiyar Ilu	156	112	37	3	8	31	32	7	0	2
HADEIJA LGA										
*Fantai	218	36	71	6	118	44	47	14	1	24
*Kuka	204	143	84	13	50	41	29	17	3	10
*Gardun S'ki	259	89	49	8	40	52	18	10	2	8
*Hago	243	145	63	0	37	49	29	13	0	7
*Madaci	233	101	18	6	23	47	20	4	1	5
BABURA LGA										
*Insharuwa	362	241	106	0	147	72	68	21	0	21
*Insharuwa -2	354	224	44	0	24	71	45	8	0	5
*Ungwal Gw	166	89	38	2	30	33	18	8	0	6
*Kyara Fln	106	170	40	0	0	21	34	8	0	0
*Garin Gn	244	156	48	2	24	49	31	9	0	8

LGAs & VLLGs*	TOTAL FROM 5 H.HOLDS IN VLLG.					PER H.HOLD AVERAGE				
	Chk.	G.fwl.	Dks.	Tks.	Pgns	Chk.	G.fwls.	Dks.	Tks.	Pgns.
KAUGAMA LGA										
*Kaugama Tu	58	53	38	8	221	11	10	7	2	44
*Zaburan	105	76	16	4	66	21	15	3	1	11
*Marke	87	127	38	4	128	17	25	7	1	26
*Unguwar Jb	112	146	28	6	90	22	29	6	1	18
*Yanleman	103	145	68	18	279	21	29	14	4	56

Table 2.9c: Family Poultry Sector: Summary from Household Stocks, Oyo State, 2006.

LGAs & VLLGs	VLLG TOTAL 5 H.HOLDS					H..HOLD AVERAGE				
	Chk	Tky	Dks	G.fwl	Pgns	Chk	Tky	Dks	G.fwl	Pgns
IDO LGA										
Adabi	64	21	17	4	0	13	4	3	1	0
Aderogba	80	0	13	0	0	16	0	3	0	0
LAGELU LGA										
Kotilo	48	0	0	0	0	10	0	0	0	0
Oke	62	17	36	2	0	12	3	7	0	0
IBADAN NORTH LGA										
Abadina	69	0	10	0	0	14	0	2	0	0
Orogun	50	0	0	0	0	10	0	0	0	0

Table 2.9d: Family Poultry Sector: Summary from Household Stocks, Enugu State, 2006.

LGAs & VLLGs*	TOTAL 5 H.HOLDS-VLLG					AVE PER H.HOLD IN VLLG.				
	Chks	Tks	Dks	GFwls	Pgns	Chks	Tks	Dks	Gfwls	Pgns
IGBO EZE LGA.										
*Amuzu	600	0	40	30	0	120	0	8	6	0
*Amokpu	905	0	100	90	0	181	0	20	18	0
NSUKKA LGA										
*Unmuke	245	65	95	40	0	59	13	19	8	0
*Ovidinaso	300	155	155	0	170	60	31	31	0	34
TOTAL 2 LGAs (20 H.holds)	1829	220	390	160	170	420	62	78	32	34

C.Trends in Structure and Growth of the Sector

An historical analysis of this sector suggests that the village poultry population including household stocks has undergone some growth over the decades to date, in Nigeria. Thus while the average households stock for chickens (the most populous) was 4.8 in 1983/84 (FOS); 17.0 in 1989 (Otchere,et al,1989) or 17.6 in 1990 (Adegbola,1990) . The data from the current limited survey showed that the household chicken stock size in the North where the rural poultry system remains largely intact was up to 49. The figure from Eastern Nigeria, was up to 181, suggesting that semi-commercial backyard poultry has probably entered the concept of rural poultry system in the East. This is not unexpected, in view of the greater tendency towards urbanisation in Eastern Nigeria. It also exemplifies the growing convergence in definition of aspects of sectors 3 and 4. The FAO/TCP report in 2000, (Adene, 2000) which attempted to avoid the flaws in definition, gave a summary from household study in Kaduna (North), Enugu (East) and Oyo-Ogun (West), as shown in Table 2.10 below. The table shows that the average number of poultry per household varies from 16.1 to 33.4 while the average number of chicken per household varies fom 14.7 to 17.1. In any case, it is an emerging reality that the rural poultry sector has been growing despite the constraints, as previously revealed by Suleiman (1990) who stated that the population of rural poultry grew from 124 million to 149 million between 1979 and 1987.

Table 2.10:Household Poultry Data (Year 2000)

Parameter	Kaduna	Enugu	Oyo-Ogun
Total poultry	1652	869	1504
Poultry per HH	20,7	16.1	33.4
Poultry per Capita	3.0	2,5	7.1
Chickens total	1176	839	770
Chicken per HH	14.7	15.5	17.1
Chicken per Capita	2.2	2.4	3.7

Source: Adene, D. F. (2000). **Action Plan – For Poultry Animal Health In Pilot Scale Study Under FGN/FAO/TCP/NIR/7822.** 81 pgs.

Although most villagers keep two, three or even more poultry species, chickens remain the commonest species in rural poultry kept in Nigeria. Older literature showed that between 65 and 88% of respondents included chickens in their household poultry stock. Although comparable data are currently unavailable, the figure from Tables2.9 a-d, show that between 51 to 67 % of all five household’s poultry species are chickens. Perhaps the only exception is among the Fulanis who do not keep ducks because of the taboo that associates ducks with detrimental impact on the performance of their main occupation, i.e. cattle rearing.

Housing for Rural Poultry

The available indications are that there has not been any tangible change in the housing system for rural poultry in Nigeria. Consistent with the low input structure, typical rural poultry are mostly unconfined, especially in day time but allowed to roam freely in household environment, scavenging to meet their needs. They often return to base towards night time when some of them roost outside the homestead, under shrubs or in disused huts or perch on trees. In some places they are provided with portable palm frond- or raffia baskets for night time roosting. In the more organised cases, the birds are provided with more permanent housing with mud walls and thatched roofs or wooden and wire cages. Such improvisations are components of the increasing sub-urban varieties of “rural” poultry and the convergence previously referred to. . In all cases, the poultry birds mainly use shelters for night time purposes. A summary from older reports showed that between 61 and 84 % of respondents provide such night time shelters for their poultry.

Feeding and Watering of Rural Poultry

Although this aspect is also influenced by the minimum input outlay of the rural poultry production system, their keepers make more tangible efforts in the sphere of feeding. Thus in most typical cases, the birds proceed to scavenge only after they have received offers of grains (corn, millet, sorghum) or bye-products like “*dusa*” in the early mornings. Some of the grains are ground into smaller crumbs for the baby chicks. It is reported that a wider variety including millet and guinea corn are more commonly used in the North while corn is more available in the South. The quantities of these items supplied vary, from one full or scanty offering to two or more servings per day. Again, in the peri-urban varieties, kitchen wastes / scraps or even some quantities of proprietary poultry feed are supplied as main feed or supplement. All these are followed in the most of the day time with scavenging for vegetable, wild fruits and seeds, grits, insects maggots and earthworms which are believed to provide a considerable proportion and variety of nutrients for rural poultry.

Majority of rural poultry keepers provide water in some form of receptacles such as broken pots and calabashes, old pans or in plastic containers. Type and quality of water are defined by the availability of natural sources like streams and brooks or improvised wells. Where rural development projects have endowed a village with bore holes or similar sources of water the birds are supplied from household stores of such water. Birds invariably search for and locate sources of water in the locality which they visit for supplementary drinking. A previous report from South-eastern Nigeria, claimed that 87.5 % of respondents do not make specific watering provisions for their poultry but expect them to locate sources of water in brooks and succulent wild fruits which invariably abound. It is obvious from all these that on the average, nutritional inputs for rural poultry is subject to a wide variations in quantity and quality; a situation which puts the fate of the birds on their scavenging proficiency. The majority of their keepers, who are mainly the household women and children, are generally interested in giving their poultry the best attention possible except where they are handicapped by elements of availability as in the limited water sources in the more arid localities.

D.Diseases Losses and Health Measures

With the minimum or no provisions for specified housing, the village poultry is inevitably exposed to the vagaries of climate and weather; stress, predators and diseases. The attrition rate from all these impacts is often up to 80%. Disease is the biggest single cause of losses in this sector.

The non-disease, losses come from chilling for growers, predators and in some cases pilfering. The major disease problems are Newcastle disease, Pox, Bursal disease, Colisepticemia, Coccidiosis and Worm infestation. Previous report claimed that 60% of respondents mentioned Newcastle disease as the major disease in their poultry. A recent FLD document also claimed that Newcastle disease alone claims over 60% of all the disease induced losses. The FAO/TCP study by Adene, (2000), clearly showed that Newcastle disease was well recognised by majority of respondent and ranked as the first disease problem (Table 2.11).

Table 2.11: Household Ranking of Major diseases of Poultry

Entries by HH	KADUNA	ENUGU	OYO-OGUN	TOTAL(%)
ND ranked first by HH	46	53	41	140 (78.2)
ND ranked second	8	1	2	11
F.Pox ranked first	3	0	1	4 (2.2)
F.pox ranked second	12	0	9	21
Other dis ranked first	26	1	1	28 (15.6)
TOTAL HH	80	54	45	179
NB: Other diseases: Gumboro, Coccidiosis, CRD, Tape Worms, Ascariidosis, Colibacillosis, Pullorum dis, F.cholera, Lice infestation				

The rural /village poultry system typically lacks access to any organised health inputs. Attempt to institute health extension services have been constrained by the structure of the system like, the small flock size and mixed age and species flock composition. Conventional poultry health packages are designed for the commercial sector and therefore feature large dose-packages usually x1000, for specific ages. The application of scheduled health inputs like vaccination and medication is therefore rare in conventional rural poultry, except in the peri-urban variety, where the keepers are more knowledgeable and have occasional access to human remedies like antibiotics and analgesics. A previous report claimed that drugs like tetracycline, M &B sulphas and aspirin fall in this category,

Of interest is the ethno-veterinary literature on the control of Newcastle disease (Abdu, et al, 2000) which lists the use of leaves of *Canabis indica*, the bark of locust bean tree,

termite hill-mushroom, barks of *Solanum sp* 'Gautan kura' or *Capsicum sp* in birds drinking water., for the control of the disease. A previous report similarly described the use of *Brissum spp* 'Nchnwu' in Hausa, with *Capsicum annum* for treatment of diseased birds.

E. Productivity and Flock Profile

There are no recent or current data, which cover the productivity of rural poultry. Existing old reports however share the same view that the productivity of rural poultry is generally much lower than that of the commercial sector. This is a reflection of the combination of phenotype, management and environment. Under extensive management, egg production is in clutches with bimodal peaks in early rainy and early dry seasons. Declines in productivity are associated with the feed shortages in the dry season. There are no recent studies on productivity in rural poultry but the productivity parameters from previous reports, which are similar for all African indigenous chickens with the collated summary in Table 2.12.

Table 2.12 Productivity Parameters in Rural Poultry

Prodt. Parameters	Chkn	Duck	G. Fowl	Turkey
Age at first egg ,dys	159.0	NA	NA	NA
Eggs at 450dys	117.5			
Ave. eggs/clutch	8 -12	15.8	16.2	9.4
Clutch duration, dys	8.0+1.8	12.5+2.0	12.5+2.0	7.00+2.0
Annual egg output	35 -50			
%Hatchability (peak)	78.3 (90)	81.6	58.0	69.1
No chicks weaned	7.2	8.3	6.2	3.9
Age at weaning mnths	3.9	5.5	4.6	6.6
Pre wean mortality %	23.4	35.7	34.0	40.0

Sonaiya(1990)

2.3. Size of the Poultry (Livestock) Sub-sector

There is no comprehensive information on the size of the poultry sub-sector in Nigeria that is based on a fairly recent survey. The only recent survey was carried out by the National Bureau of Statistics (NBS) (formerly Federal Office of Statistics). It covered the whole livestock sector and the information generated on poultry rearing in the survey excluded the commercial poultry

production activities (Sectors 1,2 and 3). The information available from the survey has a number of shortcomings. First, there is no information on Lagos and Bayelsa States, thus presuming “wrongly” there is no rural poultry in these two states. Second, the survey, even though it covered information of flock size did not capture information on flock structure. Lastly, it also did not capture any information on diseases’ prevalence.

Table 2.13 presents projected population of poultry in Nigeria as presented by the Federal Department of Livestock and Pest Control Services. The table puts the estimated population of poultry in Nigeria as at year 2003 as 137,678,943 comprising 115,880,864 or 84% as backyard poultry and 21,798,079 or 16% as exotic poultry. Given the fact that there are commercial poultry farms based on exotic birds being operated backyard poultry and there are subsistence household poultry rearing also based on exotic birds mostly around the cities, (see Sections 2.1 above), this classification into exotic and backyard does not give a clear picture. The exotic birds have a higher productivity and provide opportunity for a higher annual off-take, especially when reared under intensive commercial production systems. Thus, it is necessary to have a clearer classification of the poultry population based on the production system.

A. Backyard/Households/ Subsistence Poultry

Information on household subsistence poultry extracted from the recent survey of the livestock sector by the National Bureau of Statistics is presented in Table 2.14. The table shows the percentage of sampled households keeping poultry. Table 2.15 shows the number of households keeping poultry in each of the states sampled. This is an extrapolation from Table 2.14. It is based on “Raising Factors” calculated by the NBS. Table 2.16 presents the average flock sizes for the various poultry covered by the NBS’s survey by states. Table 2.17, which is the product of Table 2.15 and Table 2.16, provides the estimates of the population of poultry in the different states.

The estimate contained in Table 2.17 puts the population of rural poultry at 65,269,582. This is exclusive of the population of rural poultry that may exist in Lagos and Bayelsa States. This estimated poultry population figure is much smaller than the FDL&PCS figure 115,880,864 that is contained in Table 2.13

Table 2.13: Nigeria's Poultry Population (2003)

States	Backyard Poultry	Exotic Poultry	Total
A/ibom	2,772,000	277,830	3,049,830
Abia	1,282,050	127,339	1,409,389
Adamawa	3,780,000	347,288	4,127,288
Anambra	2,483,250	248,889	2,732,139
Bauchi	5,832,750	5,846,006	11,678,756
Bayelsa	900,900	90,295	991,195
Benue	6,121,500	613,541	6,735,041
Borno	5,313,000	532,508	5,845,508
C/river	1,155,000	115,763	1,270,763
Delta	2,356,200	236,156	2,592,356
Ebonyi	2,347,514	3,542,333	5,889,847
Edo	1,120,350	112,290	1,232,640
Ekiti	2,656,500	266,254	2,922,754
Enugu	1,859,550	1,863,776	3,723,326
Fct	3,465,000	347,288	3,812,288
Gombe	462,000	46,305	508,305
Imo	5,832,750	584,601	6,417,351
Jigawa	4,389,000	439,898	4,828,898
Kaduna	2,564,100	256,993	2,821,093
Kano	3,528,000	324,135	3,852,135
Katsina	4,735,500	474,626	5,210,126
Kebbi	6,930,000	694,575	7,624,575
Kogi	3,349,500	335,711	3,685,211
Kwara	3,037,650	304,455	3,342,105
Lagos	2,852,850	285,933	3,138,783
Nassarawa	531,300	53,251	584,551
Niger	2,772,000	277,830	3,049,830
Ogun	3,234,000	324,135	3,558,135
Ondo	3,003,000	300,983	3,303,983
Osun	3,234,000	324,135	3,558,135
Oyo	2,829,750	283,618	3,113,368
Plateau	3,453,450	346,130	3,799,580
Rivers	3,465,000	347,288	3,812,288
Sokoto	1,339,800	134,285	1,474,085
Taraba	2,460,150	246,574	2,706,724
Yobe	3,118,500	312,559	3,431,059
Zamfara	5,313,000	532,508	5,845,508
Grand total	115,880,864	21,798,079	137,678,943
%	84%	16%	

Source: Federal Ministry of Agriculture and Rural Development, Federal Department of Livestock and Pest Control Services. Highly Pathogenic Avian Influenza Standard Operating Procedures, February 2006

Table 2.14: Percentage of Households Keeping Subsistence Poultry by States

State	Chicken	Guinea Fowl	Duck	Turkey	Other Birds	Total
Abia	58.5	0	1.1	0.6	1.2	61.4
Adamawa	26.5	2.9	5	0.1	0	34.5
Akwa ibom	48.1	0	0	0	0	48.1
Anambra	44.6	0.4	0	0.7	6.7	52.4
Bauchi	22.3	11.4	5.2	0.2	0.4	39.5
Benue	51.2	0	3.5	0.4	0	55.1
Borno	17.3	1	1.5	0.1	0.1	20
Cross_rivers	59.6	1.7	0.6	0	0	61.9
Delta	100	0	0	0	0	100
Ebonyi	49.1	0.3	0.5	0.3	0	50.2
Edo	53.6	0	1.7	0	0	55.3
Ekiti	47.7	2.4	2.2	0.4	0	52.7
Enugu	58.9	0.1	0	1	0	60
Gombe	27.3	4.7	4.6	0	0.5	37.1
Imo	48.8	0	0	0.9	0	49.7
Jigawa	16.4	4.3	2.2	0.1	0.4	23.4
Kaduna	34	2.8	5.1	1.1	0.4	43.4
Kano	17.3	7.1	3.7	0.4	0	28.5
Katsina	19.8	8.4	7.1	1.2	1	37.5
Kebbi	26.5	1.8	0.3	0	0	28.6
Kogi	42.1	0.3	8.4	0	0	50.8
Kwara	43.6	0.3	3.6	0.7	0	48.2
Nassarawa	40.1	2.6	4.9	0.1	0	47.7
Niger	43.4	3.1	6.1	0	2.1	54.7
Ogun	71.2	2.8	0	0	0	74
Ondo	54.7	1.1	0	0	0	55.8
Osun	56.6	0	0.3	0.1	0.3	57.3
Oyo	41.5	0	0.9	0	0	42.4
Plateau	41.7	2.4	4.9	0	0	49
Rivers	56.4	0.4	0	0	0	56.8
Sokoto	21.1	2	0.5	0.2	0	23.8
Taraba	43.7	0	2.4	0	0	46.1
Yobe	18.2	2.2	1	0.4	0	21.8
Zamfara	14.7	8.3	0.8	0.7	0	24.5
FCT	41.7	0	7.1	0	0	48.8
Total	27.2	4.6	3.3	0.4	0.4	35.9

Source Estimated based on raw data National Bureau of Statistics, 2006

Table 2.15: Number of Households Keeping Subsistence Poultry by States

STATE	CHICKEN	GUINEA FOWL	DUCK	TURKEY	OTHER BIRDS	TOTAL
Abia	81,382		1,508	831	1,662	85,383
Adamawa	119,355	13,058	22,315	450		155,178
Akwa ibom	119,023					119,023
Anambra	160,804	1,569		2,683	24,273	189,329
Bauchi	364,499	185,539	84,223	2,534	5,850	642,645
Benue	168,322		11,659	1,457		181,438
Borno	140,359	8,403	11,888	556	937	162,143
Cross_rivers	48,410	1,391	506			50,307
Delta	109					109
Ebonyi	15,709	82	164	82		16,037
Edo	41,348		1,328			42,676
Ekiti	35,534	1,761	1,669	322		39,286
Enugu	98,089	124		1,611		99,824
Gombe	74,232	12,843	12,577	84	1,427	101,163
Imo	208,844			3,841		212,685
Jigawa	154,449	40,590	21,063	901	4,039	221,042
Kaduna	267,545	22,317	39,747	8,304	2,855	340,768
Kano	463,713	190,480	98,438	11,006		763,637
Katsina	356,283	151,345	127,251	21,478	18,415	674,772
Kebbi	238,714	15,808	3,099			257,621
Kogi	40,626	322	8,130			49,078
Kwara	67,447	410	5,579	1,012		74,448
Nassarawa	97,039	6,180	11,873	360		115,452
Niger	92,807	6,568	13,036		4,513	116,924
Ogun	9,949	398				10,347
Ondo	20,334	403				20,737
Osun	73,710		447	149	447	74,753
Oyo	127,968		2,647			130,615
Plateau	132,070	7,665	15,444			155,179
Rivers	40,252	276				40,528
Sokoto	205,721	19,505	4,514	2,269		232,009
Taraba	57,973		3,155			61,128
Yobe	58,311	6,920	3,101	1,387		69,719
Zamfara	52,716	29,877	2,693	2,418		87,704
FCT	8,350		1,428			9,778
Total	4,241,996	723,834	509,482	63,735	64,418	5,603,465

Source Estimated based on raw data National Bureau of Statistics, 2006

Table 2.16: Average Poultry Flock Sizes per Household

State	Chicken	Guinea Fowl	Ducks	Turkeys	Other Birds
Abia	14		5	3	17
Adamawa	10	5	9	1	
Akwa Ibom	9		55		
Anambra	10			6	5
Bauchi	20	16	10		
Benue	33		8	20	
Borno	22	14	9	43	15
Cross River	10	3	7		
Delta	177				
Ebonyi	14				
Edo	6		3		
Ekiti	8	10	7	12	
Enugu	11	5		3	
Gombe	15	8	6		4
Imo	18			7	
Jigawa	18	30	11		33
Kaduna	19	6	5	2	2
Kano				12	
Katsina	18	15	10	8	45
Kebbi		11	8		
Kogi					
Kwara	9		7	2	
Nasarawa	14	6	12	6	
Niger	16	10	9		17
Ogun	12				
Ondo	5	8	2		
Osun	6		5	4	2
Oyo	15		4		
Plateau	10	5	3		
Rivers	18		12		
Sokoto			8		
Taraba			14		
Yobe	13	24	8	2	
Zamfar	19	8	13	14	
FCT	14		6		

Source Estimated based on raw data National Bureau of Statistics, 2006

Table 2.17: Estimated Subsistence Poultry Populations by States

STATE	CHICKEN	GUINEA FOWL	DUCK	TURKEY	OTHER BIRDS	TOTAL
Abia	1,139,348	0	7,540	2,493	28,254	1,177,635
Adamawa	1,193,550	65,290	200,835	450	0	1,460,125
Akwa ibom	1,071,207	0	0	0	0	1,071,207
Anambra	1,608,040	0	0	16,098	121,365	1,745,503
Bauchi	7,289,980	2,968,624	842,230	0	0	11,100,834
Benue	5,554,626	0	93,272	29,140	0	5,677,038
Borno	3,087,898	117,642	106,992	23,908	14,055	3,350,495
Cross_rivers	484,100	4,173	3,542	0	0	491,815
Delta	19,293	0	0	0	0	19,293
Ebonyi	219,926	0	0	0	0	219,926
Edo	248,088	0	3,984	0	0	252,072
Ekiti	284,272	17,610	11,683	3,864	0	317,429
Enugu	1,078,979	620	0	4,833	0	1,084,432
Gombe	1,113,480	102,744	75,462	0	5,708	1,297,394
Imo	3,759,192	0	0	26,887	0	3,786,079
Jigawa	2,780,082	1,217,700	231,693	0	133,287	4,362,762
Kaduna	5,083,355	133,902	198,735	16,608	5,710	5,438,310
Kano	0	0	0	132,072	0	132,072
Katsina	6,413,094	2,270,175	1,272,510	171,824	828,675	10,956,278
Kebbi	0	173,888	24,792	0	0	198,680
Kogi	0	0	0	0	0	0
Kwara	607,023	0	39,053	2,024	0	648,100
Nassarawa	1,358,546	37,080	142,476	2,160	0	1,540,262
Niger	1,484,912	65,680	117,324	0	76,721	1,744,637
Ogun	119,388	0	0	0	0	119,388
Ondo	101,670	3,224	0	0	0	104,894
Osun	442,260	0	2,235	596	894	445,985
Oyo	1,919,520	0	10,588	0	0	1,930,108
Plateau	1,320,700	38,325	46,332	0	0	1,405,357
Rivers	724,536	0	0	0	0	724,536
Sokoto	0	0	36,112	0	0	36,112
Taraba	0	0	44,170	0	0	44,170
Yobe	758,043	166,080	24,808	2,774	0	951,705
Zamfara	1,001,604	239,016	35,009	33,852	0	1,309,481
FCT	116,900	0	8,568	0	0	125,468
Total	52,383,612	7,621,773	3,579,945	469,583	1,214,669	65,269,582
Source Estimated based on data from Tables 2.15 and 2.16						

B. Commercial Poultry

There is no recent nationwide survey on commercial poultry. Thus, estimates of the size of the commercial poultry in Nigeria can only be through proxy variables. Proxy variables that could be used to develop a quantitative estimate of the size of the industry include:

1. GPS import, PS and day old chicks production
2. Critical feed ingredients (lysine, methionine, fish meal and soya meal) import and utilization
3. Poultry drugs and vaccine imports, local production and utilization

A set of estimates based on GPS import, PS and day old chicks production is provided in Table 2.18. The table shows that the annual production capacity of the commercial poultry in Nigeria is estimated as 96,981,001kg dressed broilers, 40,738,698kg dressed culled layers and 8,216,208,000 eggs (273,873,600 crates of eggs).

Table 2.18: Estimates of Commercial Poultry Production Capacity based on Grand Parent Stock and Parent Stock Capacities

Grand Parent Stock in Nigeria

Breed		Production Capacity	
Heavy	46,000	1,308,125	Parent Stock per annum
Light	33,000	1,543,750	Parent Stock per annum
Total	79,000	2,851,875	Parent Stock per annum

Parent Stock in Nigeria

	Confirmed figures	Unconfirmed figures	Total
Bx P.S.	885,500	88,550	974,050
Black Layer P.S.	311,500	31,150	342,650
Brown Layer P.S.	287,000	28,700	315,700
Total Layers P.S.	598,500	59,850	658,350

Estimated Annual Day Old Chicks

Broiler D.O.C.	
Bx D.O.C	74,486,176
Layers Commercial D.O.C.	
a) Black Layer: Black Px D.O.C.	17,817,800
b) Brown Layers: Brown Px D.O.C.	16,416,400
Total Layers D.O.C.	34,234,200

Frozen Chicken (Broilers)

2.0kg Live Weight	138,544,287	kg
70% Dressed Weight as Frozen Chicken	96,981,001	kg

Frozen Chicken (Culled Layers)

1.7kg Live Weight	58,198,140	kg
70% Dressed Weight as Frozen Chicken	40,738,698	kg

Table Eggs

Eggs	8,216,208,000
Crates of Eggs	273,873,600

Table 2.19 presents information on the quantities of some critical feed ingredients imported from year 2000 to 2005. These feedstuffs are lysine, methionine, fishmeal and soy meal. The first three feedstuffs are not produced at all in the country while soy meal is produced only in fairly small quantities. The quantities of these inputs imported are indicative of the quantities of feed produced in the livestock feeds industry in Nigeria.

Table 2.19: Imports of Selected Feedstuffs (2000 - 2006)
(kg)

<i>Year</i>	Fish meal	Lysine	Methionine	Soya meal
2000	2,537,489	283,077	511,447	7,499,870
2001	3,743,508	550,790	670,953	8,918
2002	2,451,993	793,328	425,722	3,100
2003	4,119,951	539,767	600,671	17,700,363
2004	35,972,571	849,430	721,963	7,142,399
2005	7,648,682	820,041	827,940	11,279,600
TOTAL	56,474,194	3,836,433	3,758,696	43,634,250
Annual Average	9,412,366	639,406	626,449	7,272,375

Source: National Bureau of Statistics, 2006

While fishmeal is used in feed formulation in the Nigerian catfish industry, lysine and methionine are usually used in poultry rations. Usually the inclusion rate of lysine and methionine in poultry rations varies between 1kg per tonne and 2kg per tonne, depending on the quality. Thus if we assume all the feeds produced are based on rations with lysine and methionine inclusion, the total annual feeds produced from these feedstuffs will be between 313 thousand and 640 thousand tonnes on the average see Table 2.20.

Table 2.20: Estimates of Poultry Feeds Produced Based on Lysine and Methionine Imports (mt)

<i>Year</i>	Lysine (kg)	Feed (mt)		Methionine (kg)	Feed (mt)	
		1kg Lysine to 1mt Feed	2kg Lysine to 1mt Feed		1kg Methionine to 1mt Feed	2kg Methionine to 1mt Feed
2,000	283,077	283,077	141,539	511,447	511,447	255,724
2,001	550,790	550,790	275,395	670,953	670,953	335,477
2,002	793,328	793,328	396,664	425,722	425,722	212,861
2,003	539,767	539,767	269,884	600,671	600,671	300,336
2,004	849,430	849,430	424,715	721,963	721,963	360,982
2,005	820,041	820,041	410,021	827,940	827,940	413,970
TOTAL	3,836,433	3,836,433	1,918,217	626,449	626,449	313,225
Annual Average	639,406	639,406	319,703	626,449	626,449	313,225

Source: Calculated based on data in Table 2.19

From Table 2.18, the total estimated live weight of broiler produced per annum is 138,544,287kg (or 138,544 mt). At a feed –meat conversion ratio of 2.2:1, the total feed requirement to support broiler production is 304,797mt. Similarly from Table 2.14, the estimated annual egg production is 8,216,208,000 eggs. At a feed consumption rate of 190.10 gm per egg, the total feed requirement to produce 8,216,208,000 eggs is 1,561,901mt. The total of these two major feed requirements of the poultry sub-sector are not conveniently accommodated within the estimated feed in Table 2.16. This could only mean that either lysine and methionine are being used in poultry feed at sub-optimal levels or some imports of these feed ingredients are not captured in the official imports data.

CHAPTER THREE

3. POULTRY IN HOUSEHOLD FOOD SECURITY

3.1 Tastes and Preferences; and Attitudes to Poultry Consumption

Among Nigerians, poultry meat and eggs are to some extent, still considered luxury foods. In the rural areas where household incomes are significantly lower than the national average¹, consumption of poultry productions is reserved for special occasions. Usually the source of the eggs and poultry meats consumed is the stocks kept by the households. The amount of eggs and meats available from this source is usually limited by low level of productivity of the birds that are reared free range.

In the urban areas, poultry meat is consumed more often due to the relatively higher level of incomes, ready availability of poultry meat either as fresh or frozen products and chains of fast foods outlets, such as “MR BIGGS”, “Sweet Sensation”, “Tantalizer”, etc whose recipes and menus are rich in chicken meat and eggs. Nonetheless, consumption of poultry meat is largely occasional for most families even in the urban centres.

However, eggs are more routinely consumed in the daily diets in the urban areas. Eggs are usually consumed as compliments to bread and yams as omelettes or in peppered sauces. When taken as breakfast, bread and egg or yam and egg are usually accompanied by tea or cocoa beverage. In some towns and cities, it is not uncommon to find the combination of bread, fried eggs and tea being sold as breakfast by the roadside.

It is important to note that the relatively lower consumption of poultry products compared to other livestock protein sources is not due to significantly higher costs of poultry products but rather due to perceptions. Table 3.1 presents the prices of livestock products in Nigeria from 2001 through 2005. From the Table, the prices per kg of meats are N474.47 -dressed chicken, N388.50 - dressed turkey, N433.37 – beef, N381.54 - goat meat and N272.83 - pork

Table 3.1:Prices of Livestock Products (Naira per Unit)

ITEMS	2001	2002	2003	2004	2005
Cattle (Bull)	49,250.00	40,234.40	41,520.70	54,800.00	56,305.00
Cattle (Cow)	44,189.00	40,935.00	50,727.20	52,370.00	51,812.00
Ram	6,958.00	8,257.00	13,197.00	14,406.00	12,978.00
Sheep	7,833.00	6,108.00		11,910.00	7,203.00
Goat	3,719.60	4,829.17	5,970.00	6,833.00	6,642.00

¹ Nigeria’s per capita income is about US\$ 380. and 70% of Nigerian subsists on less than US\$1.00 per day (National Planning Commission, 2005) The Federal Government stipulated minimum wage is N10,000.00 per month. States of the Federation are free to fix their own salary structures some of which have been fixed at levels lower than that of the Federal Government.

ITEMS	2001	2002	2003	2004	2005
Pig	10,178.13	8,913.90	9,323.00	11,933.00	12,285.00
Rabbit		395.10	643.00	645.00	645.50
Cockerel	394.90	498.25	650.00	790.00	689.56
Local Chicken	423.75	355.60	403.70	521.00	507.59
Broiler	458.00	583.00	692.36	863.00	844.31
Exotic Turkey	3,000.00	3,741.25	4,590.00	4,589.00	4,372.50
Culled Layer	374.50	376.00	510.55	602.00	597.89
Guinea Fowl	335.00	389.53	395.24	418.00	421.82
Duck			576.14	583.00	-
Beef (per kg)	296.25	348.50	393.78	356.00	433.37
Goat Meat (per kg)	292.00	329.71	374.46	318.00	381.54
Mutton (per kg)	251.00	316.87	335.19	328.00	349.87
Pork (per kg)	250.00	273.23	272.14	269.00	272.83
Bush Meat (per kg)	325.00	389.20	467.50	700.00	575.00
Whole Liver (per kg)	297.00	294.17	375.00	316.00	340.80
Whole Kidney (per kg)	278.00	275.83	350.00	304.00	334.75
Dressed Chicken (per kg)	326.50	369.40	403.00	477.00	474.47
Dressed Turkey (per kg)		336.67	360.00	377.00	388.50
Eggs /Crate	298.00	346.10	356.38	408.00	403.44
Powdered Milk	350.00		365.00	370.00	370.00
Tinned Milk	56.90	55.83	58.00	59.00	65.00
Fresh Milk (per litre)			98.00	120.00	150.00
Nono (per litre)		21.00	25.00	-	50.00
Butter / Kg		151.25	165.83	268.00	235.97
Cheese /Kg		187.50		285.00	86.25
Yorghort/25ml	42.50	42.50		45.00	51.20
Source: Federal Livestock and Pest Control Department, 2006					

3.2 National and Household Expenditures on Poultry

The proportion of households' expenditure that is devoted to poultry products provides an indication of the importance of poultry in household food security. National and household expenditures estimates on poultry meats and eggs are however not available. Household expenditure survey (consumer Survey) has not been carried out by National Bureau of Statistics for several years. Hence for this study, the quantities and values of poultry products produced by the commercial poultry industry in Nigeria plus imports and stocks slaughtered by households for consumption will be used as indicators of the importance of poultry products in the national food security. These quantities and values represent the contribution of the poultry industry to national and household food security.

3.2.1 Local Production from Commercial Poultry

Estimates of local production of poultry products from the commercial poultry industry in Nigeria are presented in Table 2.14. The intermediate products are day old chicks for parent stock, broilers and layers while the final products are table eggs and birds. Most of the final products are consumed by Nigerian households while a small proportion is

exported to neighbouring West African countries. The quantities and values of final products are presented in Table 3.2.

Table 3.2: Estimated Quantities and Values of Final Poultry Products

Product	Quantity	Price per Unit (N)	Value (N)
Chicken (dressed weight of broilers, kg)	96,981,001	474.47	46,014,575,544.47
Chicken (dressed weight of culled layers, kg)	40,738,698	335.99	13,687,795,141.02
Table Eggs (crates)	273,873,600	403.44	110,491,565,184
TOTAL			170,193,935,869.49

Source: Calculated from data contained in Tables 2.18 and 3.1. The assumption here is that the estimated production capacity based on DOCs are fully utilized.

3.2.2 Imports of Poultry Products

The imports of chilled and frozen poultry meats into Nigeria for the years 2000 to 2005 are presented in Table 3.3. The table shows that the total import of poultry products over the five-year period is 11,045,522 kg. The import figures declined from 421,569kg in 2003 to 2,235kg in 2005 probably in response to government policy support for local poultry production. Thus indicating a declining contribution of poultry imports to poultry products consumption in Nigeria.

Table 3.3: Imports of Chilled and Frozen Poultry

<i>Year</i>	<i>Net Weight (kg)</i>	<i>Value (N)</i>
2000	430,271	23,820,024
2001	5,818,551	151,827,551
2002	4,370,097	314,509,630
2003	421,569	5,485,661,280
2004	2,799	577,041
2005	2,235	7,614,045
TOTAL	11,045,522	5,984,009,571

Source: National Bureau of Statistics, 2006

3.2.3 Stocks Slaughtered By Households for Consumption

The contribution of rural poultry to household food security is indicated by the quantity of poultry products emanating from this type of poultry that is consumed. Normally these are meat and eggs with the meat being the more important of the

two. Most times the birds are allowed to hatch their eggs so as to increase the household stock. Thus egg offtake is usually not too significant.

Table 3.4 presents the number of stocks slaughtered and sold by various households. The slaughtered stocks were consumed by household members thus constituting part of their food the year 2005. The stock sold were either purchased for slaughter by other non-livestock rearing households especially in the urban communities or added to the stock of other livestock rearing households.

Table 3.4: Number of Livestock Slaughtered and Sold from Household Stock by Type, 2005

Type	Own-slaughters	Number Sold
Cattle		1,830,645
Goat	2,962,007	7,807,185
Sheep	1,715,471	3,617,708
Pig	100,412	348,229
Chicken	12,153,631	17,892,267
Guinea fowl	1,565,756	2,275,822
Duck	1,135,133	1,180,461
Turkey	60,312	69,718
Other birds	174,805	223,639
All birds	15,089,637	21,641,907

Source: National Bureau of Statistics, 2006

Table 3.5 presents the estimates of poultry meat derived from poultry stock slaughtered and consumed by poultry households in 2005. The table shows that the estimated dressed weight of the poultry stock slaughtered is 16,239,246kg. This quantity is exclusive poultry stock sold to earn income, which would either have been slaughtered/consumed by non-poultry keeping households or have been added to the poultry stocks of other households.

Table 3.5: Estimated Poultry Meat from Households' Own Slaughter, 2005

Type	Own-slaughters	Price per Live Bird (N)	Value (N)	Average Live Weight per Bird (kg)	Live Weight (kg)	Dressed Weight (70% of Live Weight) (kg)
Local						
Chicken	12,153,631	507.58	6,168,940,023	1.5	18,230,446.5	12,761,313
Guinea fowl	1,565,756	421.82	660,467,196	1.6	2,505,209.6	1,753,647
Ducks	1,135,133	583.00	661,782,539	2.0	2,270,266	1,589,186
Turkey	60,312	2628.00	158,499,936	3.2	192,998.4	135,099
Total	14,914,832		7,649,689,694		23,198,921	16,239,246

Source: Estimated based on Own Slaughter estimates from Table 3.4

The information contained in these tables provides an indication of the contribution of the poultry sub-sector to households' food security in the absence of national household expenditure survey. From these tables, the contribution from broiler meat from commercial poultry and poultry meat from household poultry are estimated at 96,981,001kg and 16,239,246kg per annum.

CHAPTER FOUR

4.0 MARKETING OF POULTRY INPUTS AND PRODUCTS

The main poultry inputs and products are:

- Input: Feed, drugs and supplements, vaccines and housing cages, feeders, waterers, etc.
- Products: Day old chicks, table birds and table eggs

This chapter is devoted to how these inputs and products are marketed in a sub-sector that is relatively more commercial oriented than any other sub-sector of the Nigerian Agriculture.

4.1 Poultry Inputs

There are several distinct players in the marketing of poultry inputs in Nigeria. These players are presented in Table 4.1

Table 4.1: Major Players in Poultry Supply Chain

Inputs	Supply Chain Players
Feed	Feed millers, grain merchants/buyer agents Importers of concentrates, additives and supplements; poultry shops and poultry farms
Drugs and supplements, and vaccines	Importers of drugs and supplements, NVRI, poultry shops, extension agents (public and private) veterinary doctors, poultry farmers.
Housing (cages, feeder, waterers, etc)	Importers, local fabricators and welders, plastic manufacturing companies, tinkers, poultry shops and poultry farmers.

4.1.1 Feed

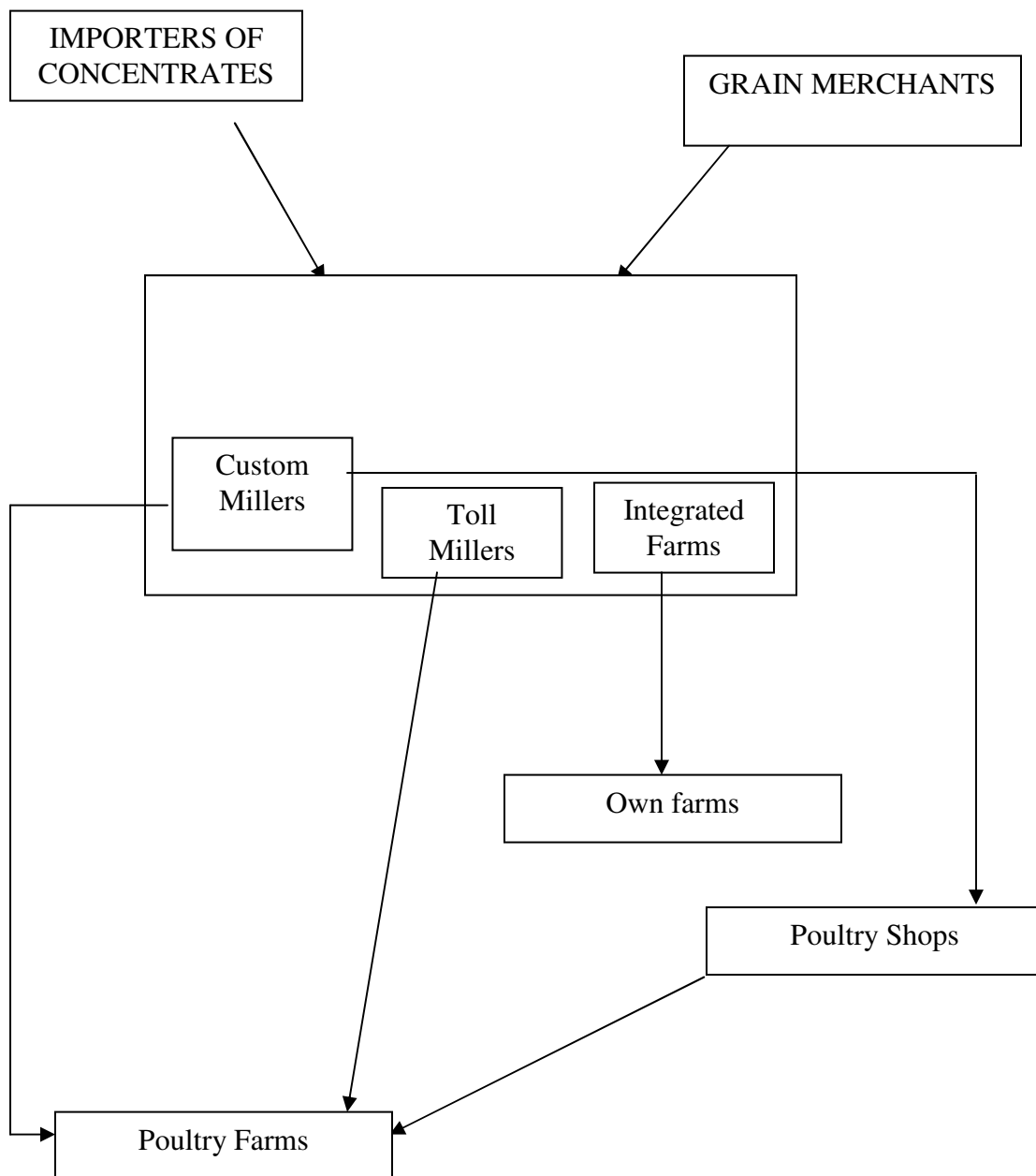
There are three types of feed millers, namely; custom, toll and integrated farms. The custom millers mill and market their feeds under registered trade names. The dominant trade names in the market include Amo Sanders, Guinea Feed, Top Feed, and Livestock Feed, among others. Some of these custom millers have adopted franchising as an operational method for achieving a wider reach across the country. The toll millers are spread across major locations with significant concentrations small to medium scale poultry farms. They will mill feed to the specification of customers (poultry and catfish farmers) and charge a fee (toll) per quantity milled. The customers either bring their feed ingredients or purchase them from the millers, if the millers have them in stock. The third category of feed millers is the integrated poultry farms, which own feed mills and produce feed for own use.

The feed millers acquire their grains from grains merchants/buying agents who source their grains mostly from the northern parts of the country. These merchants have established networks for aggregating grains from smallholder farmers and have mastered the logistics of grain transportation across the country.

The feed mills mostly depend on some importers for the supply of the imported feed ingredients such as fish meal, lysine methionine, soy meal etc. These importers also use intermediaries to reach the feed millers that are spread across the country but with higher concentration in the south. The poultry shops generally market various inputs of the poultry sub-sector; one of which is branded feeds obtained from custom feed millers. The poultry farms that do not have their own feed mills hence have the options of patronizing the toll millers, custom millers, or the poultry shops.

An overview of supply chain for feed is provided in Figure 4.1

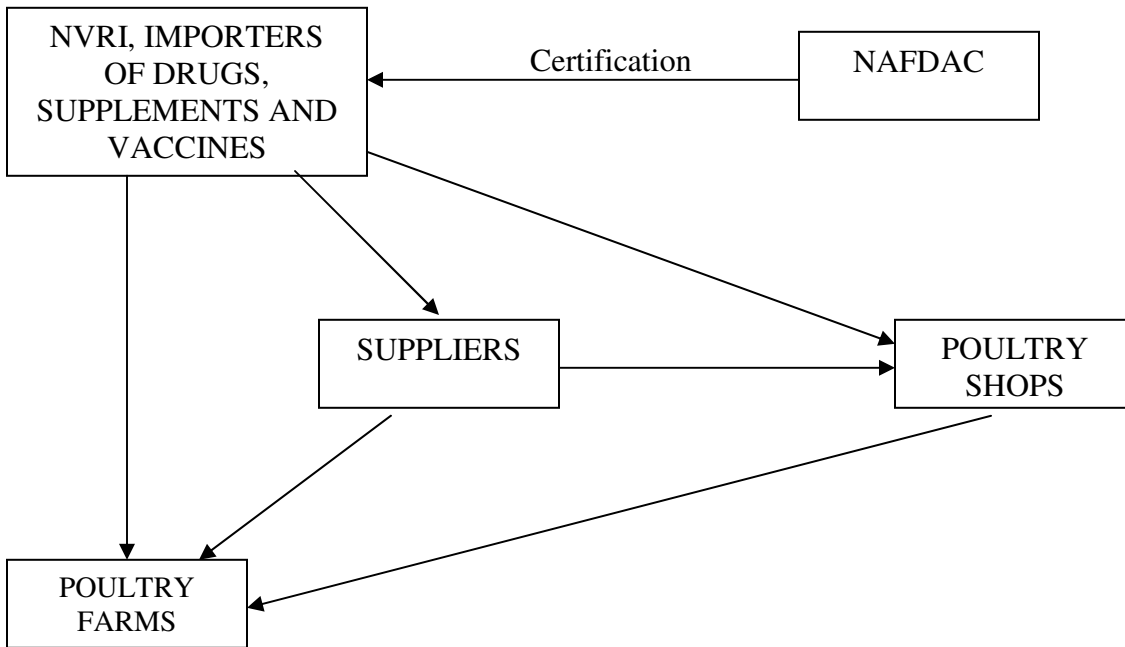
Figure 4.1. Poultry Feed Supply Chain



4.1.2 Drugs, Supplements and Vaccines

There are major importers of poultry drugs, supplements and vaccines. NVRI also produces some quantities of vaccines locally. The large-scale poultry farms obtain their supplies either directly or through suppliers from these importers. The small to medium scale poultry farms obtain their supplies from the poultry shops, private sector poultry extension agents and at times from veterinary doctors. An overview of the supply chain for drugs, supplements and vaccines is provided in Figure 4.2

Figure 4.2: Supply Chain For Poultry Drugs, Supplements and Vaccine

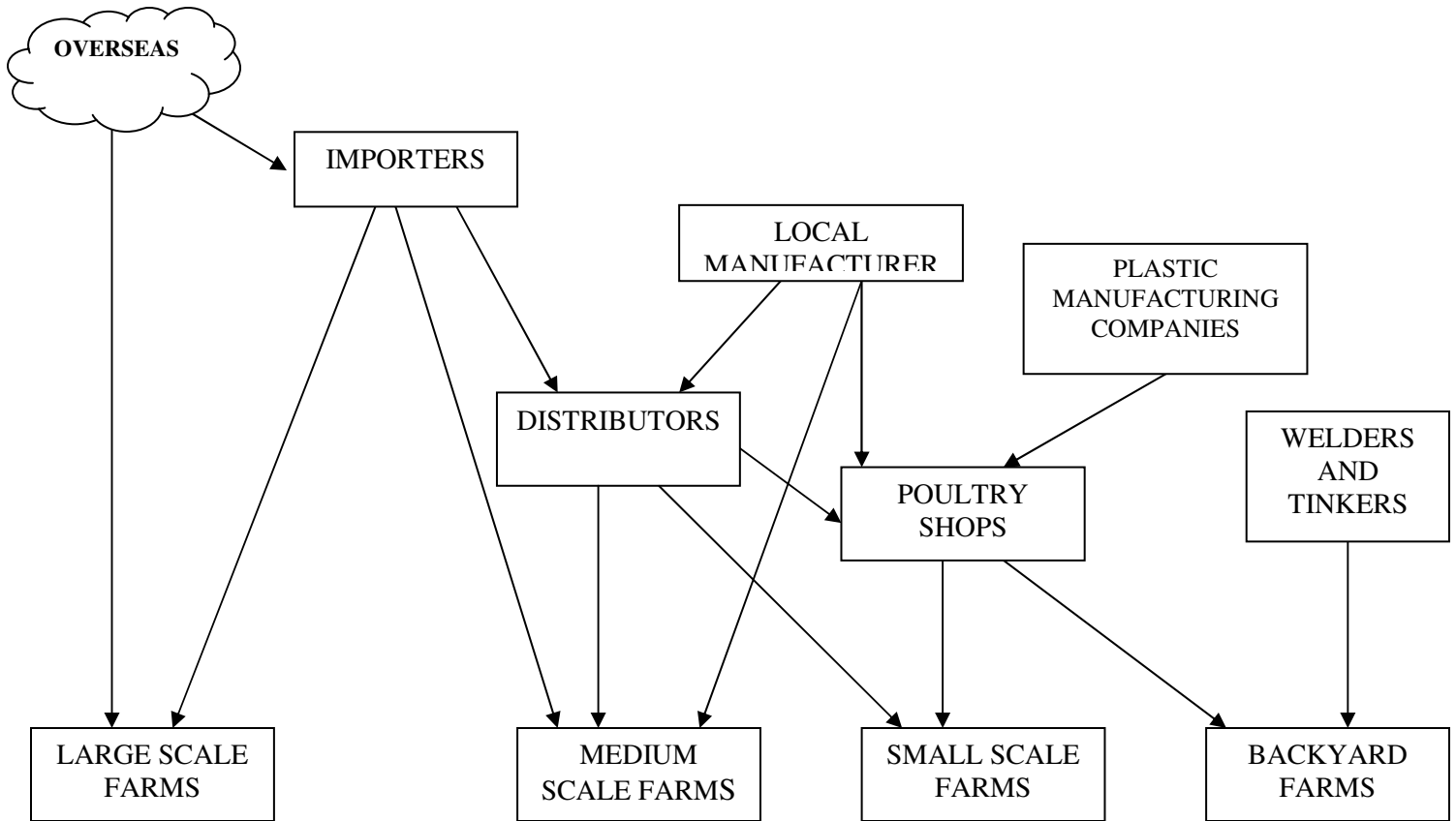


4.1.3 Housing

Poultry pens are usually custom-designed and built while other poultry housing equipment, are usually procured already finished. They are a few major importers of poultry equipment among which are Dizengoff and FACCO. The products of these importers are usually patronized by the medium to large-scale poultry farms. Most of the small-scale poultry farms usually patronize the locally manufactured poultry equipment.

An overview of the supply chain for poultry housing equipment is presented in Figure 4.3

Figure 4.3: Supply Chain for Poultry Housing and Equipment



4.2 Poultry Products

4.2.1 Products Distribution

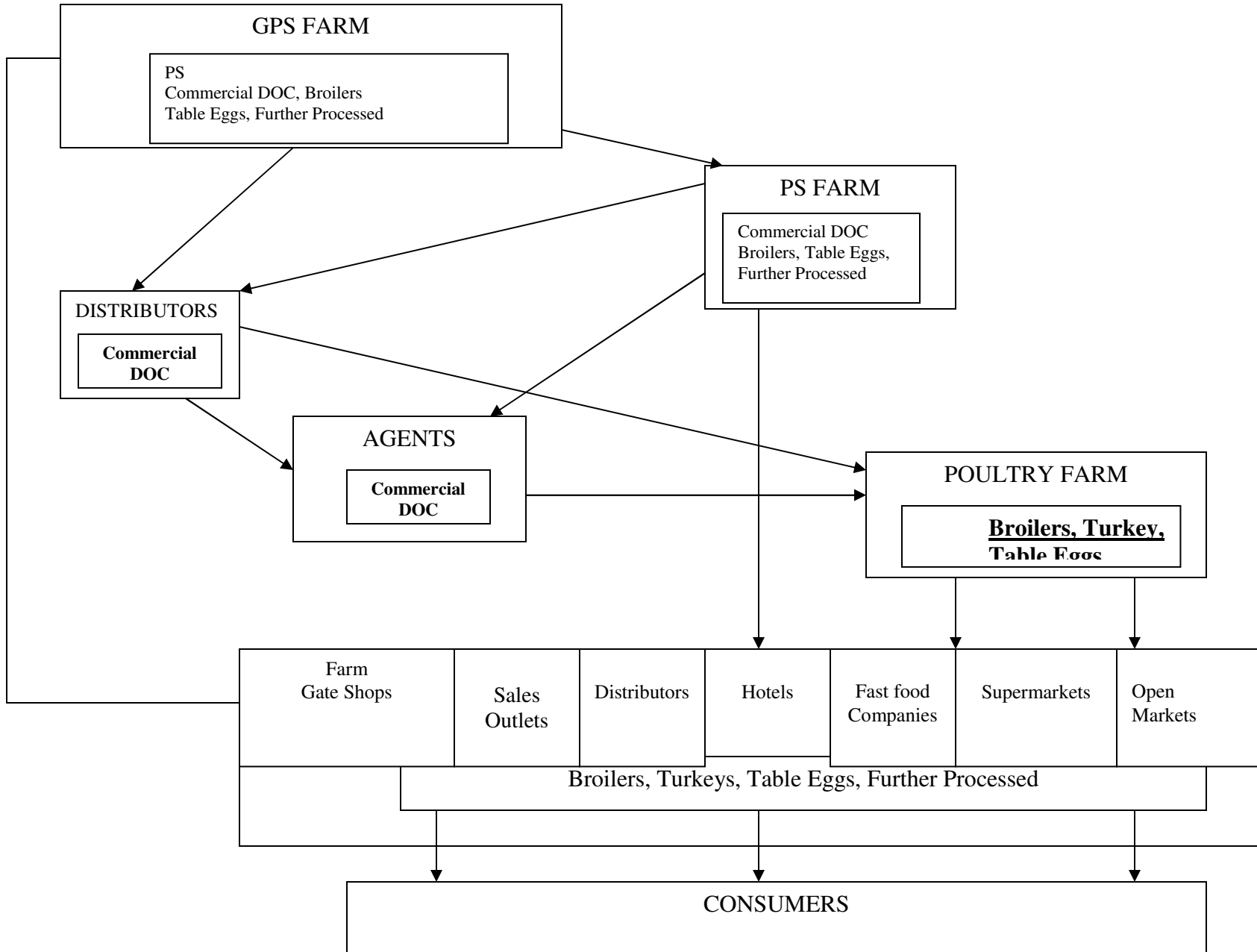
The main poultry products from the Nigerian poultry sub-sector are parent stock, commercial day old chicks, frozen chicken, table birds. The parent stocks are sold either directly to farms or through distributions or agents. Similarly, commercial day old chicks are also sold either directly to farms through distributor or agents. Some of the agents are the operators of the poultry shops who market various types of poultry inputs.

Frozen chicken and table eggs are sold to the consumers through a number of sources. These are

- ❑ Farm gate
- ❑ Sales outlets
- ❑ Distributors
- ❑ Hotels
- ❑ Supermarkets
- ❑ Fast foods companies
- ❑ Hospitality industry operators
- ❑ Open markets

Table birds, broilers, culled layers and turkeys are sold through the farm gate, agents and open markets to the final customers. An overview of the supply chain for poultry products is presented in Figure 4.4.

Table 4.4: Supply Chain for Poultry Products



4.2.2 Products Pricing and Prices

The major determinants of products pricing are costs of production and season of the year. There is usually seasonal peak in the demand for poultry meat. These peaks are usually at December (Christmas/New year festivals) and April (Easter Festival). The demand for eggs is fairly stable at all the year round. Current average of products at farm gate are:

Product	Average price (₦)
Broilers P.S	750
Layer P.S	800
Commericla P.X	120
Commercial B.X	130
Dressed broiler	350/kg

Most of the transactions are on cash basis.

4.2.3 Slaughtering and Processing

There are designated abattoirs in major towns and cities across Nigeria. However, only cattle are slaughtered and divided amongst beef retailers in these abattoirs on daily basis. A relatively insignificant number of other ruminants is also slaughtered in the abattoirs. Beyond slaughtering, splitting the carcass into smaller portions that fall within the capacity of retailers to buy and actual sales to retailers, nothing else take place in these abattoirs.

In most cases, it is the large-scale poultry farms that process their table birds into frozen chicken, chicken and turkey parts. Industry experts indicate that about 90% of broiler production are slaughtered, processed and sold as frozen chicken, while the rest is sold live in the open market and slaughtered in various homes. About 50% of the broiler produced are processed in automated slaughtering plants and stored in cold rooms before distribution and sales.

4.2.4 Transportation of Products

Transportation of poultry products is mainly by road. Occasionally, air freighting of dayold chicks in done for long distances.

Usually the big hatcheries transport dayold chicks with appropriately designed vans. Otherwise, other types of vehicles (cars, buses, truck, motorcycles, etc) are used. Frozen chicken are usually transported by processors to their sales outlets, supermarkets and major customers in cool vans and refrigerated trucks. Retailers use all types of vehicles including motorcycles.

Live table birds are put in plastic and cane basket cages and then transported in all types of vehicles. Table eggs are packed in crates. The crates are stacked in cartons that are then transported in all types of vehicles. Often, the crates are loaded directly into the vehicles and transported.

4.3 Marketing of Products from Rural Poultry

The products from rural poultry sector are eggs and meat. An overview from old literature and available comments showed that poultry mean more than eggs and meat (food) to the keepers. The farmer may sell off surplus cocks and hens, especially the unproductive ones

for cash needs. Although efforts are made to get as much as possible of the eggs hatched for the replenishment of stock, some may occasionally be sold for cash needs. Guinea fowls, which are the most prolific among the rural poultry species but poor hatchers and mothers, have most of the eggs sold for cash and food. Indeed, guinea fowl eggs are relished by Nigerians for their superior taste. On the other hand, pigeons are kept mainly for meat. However it is the purposes for which the birds are kept that can present a more realistic picture of the value of rural poultry. Such other purposes which rural poultry serve are as gifts to honoured guests, for ritual or religious sacrifices or for ceremonial foods on communal scale. Cock fighting is not a popular game in Nigeria and the rural poultry has little or no role to play in such games. Sales of live birds, are sold mainly by women and children on village market days which often attract buyers from other villages and the urban market agents. Some of such agents assemble large numbers of chickens bought from a number of markets and convey them in large baskets in trucks to southern cities and towns for sale.

4.4 **Regional (Inter-State) Trade in Poultry Products**

There is a concentration of commercial poultry farms that are based on the exotic chicken in the South; especially the South-West Nigeria, while most of the rural poultry that is based on the “indigenous” chicken” and guinea fowl is found in Northern Nigeria. This seeming regional specializations form the basis of the inter-regional trade. The products of commercial poultry, especially frozen chicken, are moved from the Southwest to the North, in most cases, through the Federal Capital Territory. On the other hand, products of rural poultry - live chicken and guinea fowls -, are moved from the North to the South, especially the Southwest.

This inter-regional trade in poultry products has implication for poultry disease transmission, especially Avian Influenza in recent times. The movement of significant number of live poultry from the North to the South provides a potential route for the transmission of Avian Influenza and other poultry diseases from the North to the South. Poultry products from the South to the North are mostly processed, frozen and containerised, thus minimising the potential of disease spread from the South to the North.

CHAPTER FIVE

5. GOVERNMENT SUPPORT PROGRAMME TO THE POULTRY SECTOR

5.1 Historical Background and Transition to the Current Status

Nigeria's poultry industry has its root in the initiatives of regional governments from the 1960s when, for example the Western Regional Government entered into joint pilot poultry production schemes with some foreign partners, notably the Israeli government.

The entry of private investors into poultry production in the late 1960s to early 1970s marked the onset of indigenous commercial poultry industry which then spread from the west to the eastern region and parts of the Northern region. The first decade or so of this period witnessed a tremendous growth in the industry, especially in the West. The size of the industry grew from less than 1million in the mid 1960s to over 40 million by the early parts of the 1980s. All along, the growth of the industry had been propped on government initiatives and incentives especially in terms of training, technological support, input support services, and others. Thus for example, many of the poultry technical staff were products of government subsidized training programmes, while inputs like vaccines and diagnostic services were subsidized by government or even free initially. Meanwhile the national economic climate was enjoying a boost from the newly advancing petroleum sector and this visibly helped to propel national investment sector, including poultry, rapidly forwards. As from this time, the poultry industry had started to be self-supporting, viable and attractive to financial institutions. However towards the end of the 1980s, government introduced policies, like the Structural Adjustment Programme (SAP), including floating foreign exchange market which were intended to diversify the economy and stimulate the nation's agricultural and industrial sectors. These policies however resulted in some unintended counter productive effects on some sub-sectors like the poultry industry. The fate of the industry in the scenario was dictated by its conspicuous dependence on imported inputs like GPS and PS, grains, feed stuff, drugs, vaccines and others. The new policies had placed a ban on the importation or restriction on the importation of many of these inputs which were the lifelines to the industry. The devaluation of the national currency obviously heightened the predicament of the import dependent poultry industry. Under this policy environment, the poultry industry collapsed rapidly. Only about 20 percent of the more than 5,000 commercial poultry farmers existing pre-SAP survived by the mid 1990s. The resulting decline in national commercial poultry stock to an all time low of about 9 million with the attendant deficit in animal protein supply, became a source of grievous concern to the government and the country. Quite naturally the indigenous (rural) poultry sector was not seriously affected by these policies, because of its low inputs demand structure. Indeed, available information claimed that the indigenous (rural) poultry grew by over 16% in the period.

These negative development in commercial poultry challenged successive governments between the late 1990s to date. The governments realized there is the need to rejuvenate the poultry industry and redress situation through policy incentives and other similar programmes. With the intensification of such programmes in recent times, the poultry sector, has through its innate responsiveness started to rediscover its feet The real turning point in this regard has been the FGN policies which placed a ban on the importation of commercial DOCs , eggs and frozen chickens. – a policy which has had the effect of boosting internal production and sufficiency in these items.

5.2 The Thrust and Examples of FGN Support Programmes

The government support programmes, which have boosted the performance of the poultry sector, have been designed to cover not only the industrial or commercial sector but also the rural and smallholder poultry. The following passages reflect the thrust and nature of such programmes.

5.2.1 General Policies on Livestock and Meat/Dairy Policies

The role of government still remains initiating national livestock policy and executing regulatory functions relating to the livestock sector. In 2002, the agricultural policy document was reviewed but the key focus is still improving the productivity and output of available resources with a view to attaining self-sufficiency in foods of animal origin. The major interventions are to ensure efficient production, stability of prices and supplies of meat and other products, promotion of animal and human health and the general welfare of livestock producers.

The general policy objective in the livestock industry is to put all available livestock resources into best use. This will be achieved by expanding resource base or increasing productivity of the existing resources through systematic improvement of the production system. An important goal is self-sufficiency in the shortest possible time for meat and milk.

The specific objectives include

- restructuring and diversifying the productive base of the livestock sub-sector
- matching available feed resources with the livestock production system
- achieving stability in livestock prices, output and income
- improving rural income from livestock production enterprises
- protection of rural farmers from the vagaries and risks incidental to production
- generating rural employment opportunities through expanded livestock production and processing
- effecting proper land use and maintenance of the ecosystem for expanded livestock production

5.2.2. Poultry Production Policy

Policy Objective: To develop a Nigerian Foundation Stock that will be more productive in terms of eggs and meat within the context of our present environment.

Policy Strategies

The policy strategies are:

1. Employment of the most modern method in genetic engineering to develop a Nigerian stock
2. Collaboration between our research institutions and some well established and experienced companies from developed countries (e.g. Euribrid of Netherlands) in the development of Nigerian Grand parent stock.
3. Establishment of grand parent farms in different ecological zones to produce parent stock for the poultry farms nationwide.

The project, which has been justified with the production of the “Shika breed” by NAPRI, recorded rapid progress and achieved this commendable outcome over the years. Although it was still active on efforts to upgrade this unique product to international standards, its progress appears to have been stalled with lack of funds. The following Tables show the productivity of the Shika brown layer breed.

Performance of FGN/NAPRI Foundation stock (Pure Breed)

Table 5.1: Performance During Wk 1-8

Age (Wks)	Mean feed g/bird -Wk	Cumulative g/bird	Avg. B. Wt g/bird	Weight gain g/bird	Mortality (%)
1	51.17	51.17	43.79	9.71	35 (6.4)
2	77.53	130.87	66.60	20.95	21 (3,8)
3	116.63	247.77	105.77	39.25	01 (0,18)
4	182.56	430.32	167.44	61.46	-
5	237.97	669.17	239.63	71.85	01 (0,18)
6	338.41	1007.58	356.81	117.17	-
7	419.3	1426.89	476.00	80.79	-
8	439.02	186.56	506.40	68.80	-

Table 5.2: Performance During Wk 9-20

Age (wks)	No. of birds	Feed (kg/wk)	Mean B. Wt (kg/wk)	Mortality (%)
9	492	227.80	0.571	-
10	492	240.59	0.686	-
11	492	276.01	0.777	-
12	489	293.89	.0884	3 (0.61)
13	488	296.70	0.964	1 (0.20)
14	487	318.50	1.043	1 (0.20)
15	487	329.70	1.127	-
16	487	292.20	1.107	-
17	487	287.82	1.190	-
18	487	293.17	1.280	-
19	461	285.82	1.258	-
20	461	332.38	1.445	-

Table 5.3: Performance 20-40wks In-Lay

Age (wks)	No. of birds	Feed (kg/wk)	Eggs Prod. (No./wk)	Feed Conv. (kg fd/doz egg)
20	461	332.3	5	797.47
21	461	343.8	26	158.65
22	460	345.2	176	23.56
23	460	327.6	461	8.53
24	460	304.9	2137	2.66
25	460	350.0	2137	1.96
26	459	341.0	2415	1.69
27	459	345.0	2380	1.74
28	459	347.9	2390	1.75
29	459	356.0	2358	1.81
30	459	412.0	2366	2.08
31	458	450.0	2224	2.43
32	458	445.0	2135	2.50
33	452	439.0	1998	2.60
34	452	439.5	1693	3.11
35	452	430.0	1898	2.72
36	452	432.0	1981	2.62
37	450	435.0	1953	2.67
38	449	435.0	2095	2.56
39	449	433.0	2069	2.51
40	449	436.0	2126	2.46

Table 5.4: Body Weight, Ages, Mortality, Feed Intake and Feed Conversion Ratios at Certain Stages of the Laying Period. NAPRI

Body weight (kg) at:		Age (weeks) at:		FCR (12 eggs) at:		Mortality % at	
50% production	1.51	First egg	19	20-32 weeks	193.4	20-32 wks	
50% production	1.69	5% production	22	33-42 weeks	6.9		0.65
40 weeks of age	1.67	50% production	24	47-59 weeks	6.8	33-42 wks	3.10
72 weeks of age	1.68	Peak production	27	60-72 weeks	9.0	47-59 wks	10.5
						60-72 wks	8.2

Government is supporting the National Animal Production Research Institute (NAPRI) to develop the Nigeria broiler line Parent Stock of Poultry as it has done for the Nigeria layer line parent Stock. The Ministry is also strengthening the role of the Strategic Grains Reserve Department in providing grains to feed millers in the event of scarcity or market shocks. Since feed constitute over 60% of the production cost of the livestock industry, Government has continued to support research into alternative local feed formulations. Research conducted outlined promising

5.3. Support Policies

5.3.1 Price support Policies

There are no records of explicit and directed livestock price policies other than those contained in the general agricultural pricing policy. The policies affecting livestock pricing in Nigeria are therefore mainly implicit and indirect deriving from monetary and fiscal policies and associated measures.

5.3.2 Methods of implementing producer price support schemes

The methods of implementing these price interventions are limited to tariff and non-tariff barriers, input subsidies and exchange control as well as Value Add taxes (VAT). Some State Governments have also re-introduced the cattle tax “Jangali” on pastoralists in order to raise the internally generated revenue of the State.

5.3.3 Non-Price measures

Some non-price planning strategies and instruments undertaken during the period under review include the restructuring of the Agricultural Bank and the reduction of interest rate on credit to less than 10%. Some anti-dumping measures were undertaken which included the restriction in the *importation of Poultry products* only through the land borders. Some projects like the Special Programme for Food Security (SPFS) and the Pan African Control of Epizootics (PACE) are being implemented to support production by promoting technical improvements and animal health.

5.3.4 Consumption Patterns and Policy

There are no administered consumer prices as prevailing prices are determined through the market forces of the demand for and supply of livestock and meat/dairy products. Livestock products are not subsidized, hence no information on changes in subsidy. Government plans to encourage the consumption of some products of through the introduction of the *School feeding Programme whereby milk add eggs* are served in primary and secondary schools at break time free of charge or at subsidized rate. Pilot projects have already been initiated in some States.

5.3.5 International Trade Policies

The objectives of government’s trade policies are to promote exports both as a way of diversifying the country’s export and as a means of boosting growth and development of the sector.

Government export policy is to minimize administrative controls of external trade through trade liberalization and promotion of competitive international trade. Nigeria is a member of the World Trade Organization and therefore will continue to respect agreements reached on international trade.

As part of the policy thrust for 2002 fiscal year, government sought to protect domestic industries against unfair competition from imports and dumping through the upward adjustment of *tariff rates for certain livestock products such as turkey parts and dressed chicken from 25% to 75%*. Also to encourage local production, poultry feed grade vitamins such as L-Lysine, antibiotics, etc were reduced from 15% to 5%, and day old chicks maintained at 5%.

5.4. **Developments in International Technical Assistance**

Until recently, the World Bank has been the main source of assistance to the sector through the First and Second Livestock Development Projects. However, in recent years technical assistance has been received through the EU/IBAR for Pan African Control of Epizootics (PACE), FGN/FAO/UTF for Special Programme for Food Security (SPFS), USAID technical assistance for Strengthening the Manpower Development in Epidemiology and Veterinary Public Health and FAO technical assistance for meat inspection and the production of the Country Report on Animal Genetic Resources.

The demonstration of the effects of this international assistance programme became very obvious during the recent HPAI epizootic in Nigeria, when fund and material supports were received as follows:

World Bank -	\$ 50 million
USAID:	\$ 25 million
	PPE = 1425 units supplied
FAO:	PPE 5655 units Supplied
	Disinfectant (750 litres) Supplied
DFID/WHO :	PPE (7000 units) (Supplied)
CDC, USA :	Training Laboratory personnel and Upgrading of NVRI laboratory facilities to characterize HPAI viruses
Thomas A Gioanis :	Chairman American Board of Health care Law & Medicine
	2,500 liters of Disinfectant
People Republic of China:	Equipment and Medicine for Artificial Insemination (AI)
South Korea	

5.5 **Pilot Vaccination Programme of Rural Poultry Against Newcastle Disease.**

Over the years, statistical data from field reports indicate that diseases, especially Newcastle Disease (ND), account for over 60% mortality in rural chickens. This high mortality can be drastically reduced through effective vaccination against these diseases especially ND. It has been established that as little as a 10% reduction in the current mortality level of the disease would lead to a 30% increase in production level in the industry.

The specific objective of the programme is to increase the production and productivity level of rural chickens that are being raised under the village production setting and, in so doing, further improve the economic returns of the rural chicken producers.

The total estimate for the programme is Two Hundred Million Naira (N200M) only. This covers the cost of disease control materials and inputs as well as other logistics (vaccines, drugs, equipment, mobility, field allowances, etc). Details of the cost estimates are as follows:

5.6 **The Millennium Development Goal Project of Federal Ministry of Agriculture**

This is a futuristic and ambitious programme, which exemplifies the focus of government policy on the poultry sector. The crux of the millennium development plan is captured in the Table 5.5 below.

Table 5.5: Highlights of The Millennium Development Goals (Fed Ministry of Agriculture and Rural Development)

PROPOSED PROJECTS	<u>Poultry Development</u>	
<p><u>Poultry production</u></p> <p>i. Increased in the numbers of eggs and poultry meat production</p> <p>Broiler production: (0-8 wks) % feed cost / total production 57.04%</p> <p>ii. Cockerel production: (0 – 6) weeks) 45.30%</p> <p>iii. Starter Pullets (0-8 wks) 50.2 %</p> <p>iv. Point of Lay production: (9-20wks): 68%</p> <p>v. Commercial Eggs Production: (21 – 72 wks) 72%</p>	<p>Syndication of loanable funds at interest rates not exceeding 9% through NACRDB for poultry farmers</p> <p>Resuscitation of moribund poultry breeding farms to enhance the utilized capacities of existing hatcheries to produce 250,000 Parent Stock for distribution to Poultry farms</p> <p>Rehabilitation of abandoned hatcheries and establishment of new ones to achieve hatching capacity of 3.0</p> <p>The poultry industry is currently private sector led and has the highest potential not only for achieving the reduction of hunger but also of poverty</p> <p>The poultry industry is currently private sector led and has the highest potential not only for achieving the reduction of hunger but also of poverty</p>	<p>The poultry industry is currently private sector led and has the highest potential not only for achieving the reduction of hunger but also of poverty</p>

5.7 Presidential Initiative on Livestock

This represents the initiative of FGN to re-activate the huge but rather dormant national livestock sector of the Nigeria agriculture. The programme seems to have emerged from the President’s personal drive towards the realization of the potential of the Nation’s livestock production capacity. The policy and programme are comprehensive. They cover all livestock types. The aspects of the initiative directed at poultry are excerpted below:

5.7.1 Background

From the inception of the present Administration, the President has organized a series of Stakeholders fora tagged “Saturday Forum” where Stakeholders discuss matters affecting their industry and propose future direction of the industry in consultation with Government. At one of these meetings, the livestock industry was the subject of discussion. The President set up a 26-man Committee on Livestock to carry out a detailed assessment of the livestock industry and make its recommendations on the way forward.

5.7.2 Targets

The Committee developed a terms of reference (TOR) with specific objectives that focus on the overall improvement in livestock production and marketing which include the following on the poultry sub-sector:

- To examine and recommend the ways of increasing animal protein intake by 50% within the next 3 years. To achieve this, requires a new policy thrust and programmes aimed at doubling the output of meat, milk and eggs during the target period

- To seek ways and means of entering the export market with commodities that can earn foreign exchange within the next 5 years.
- Poultry Production to be resuscitated to pre-SAP level by using the unutilised installed capacities in hatcheries, feed mills, and breeding units. The commercialisation of the Shika Brown, which was developed by NAPRI as source of local parent stock of poultry, to be pursued vigorously.
- Inputs Supplies, Marketing and Support Services to be developed to ensure a proper linkage with production by making available veterinary services, extension services, vaccines and drugs, feeds, processing and storage facilities, development of abattoir and slaughter facilities, including utilization of by-products of animal origin.

After a general review of various development areas within the livestock sub-sector, the Committee went further to identify the types of intervention required and thereupon recommended programmes in these areas that will assist in achieving set objectives, which include:

i. Feed and Nutrition

ii. Animal Breeding and Genetic Improvement

Establishment of Cattle, Sheep, Goat, Pig Multiplication Centres

Establishment of Poultry Production Units and micro livestock or meat from non-conventional sources

iii. Poultry Development

- Hatchery Capacity Enhancement Programme
- Shika Brown Layer and Foundation Stock of Broiler Development Programme
- Breeding Farms Expansion Programme
- Feed mill Capacity Enhancement Programme
- Promotion of Institutional Demand for Poultry Products
- Promotion of Industrial Demand for Poultry Products
- Poultry Research and Development Programme
- Poultry Producers Registration Programme
- Family Poultry Development Programme

iv. Livestock Processing and Marketing

- Standardisation of the Marketing system
- Development of an Export market for Livestock and Livestock Product
- Poultry Products Processing Programme

v. Animal Health and Veterinary Services

- Effective control of Trans-boundary Animal Diseases (TADS), Zoonotic and other diseases of economic importance.
- Provision of functional infrastructure for vaccine production and veterinary services delivery
- Institutional strengthening (FDL&PCS, NVRI, NAFDAC, States & LGA)
- Provision of veterinary inputs
- Food Safety
- Establishment of Export Processing Zones

vi. Grazing Reserves and Stock Routes

- Accelerated Development of Stock Routes and Grazing Corridors

vii. Livestock Extension Services

- Draw up extension priorities at local level, as livestock production needs may not be predictable in
- Train animal health workers in Information and Communication Technology (ICT) and use them for extension in a targeted way.

viii. Export of Livestock Products

- Vitamins, Premixes and Concentrates
- Livestock vaccines, and veterinary drugs
- Valued added livestock products e.g. eggs and poultry products, Hides and Skins, Processed horns.

5.7.3. Funds Requirement and Funding

The Committee arrived at cost implications for the total number of activities at 15 billion Naira but a total of 5 billion Naira was approved for the 3 years spanning 2004 to 2006. The spread of funds from

Table 5.6: Budget for The Presidential Initiative Programme on The Livestock Sector

<u>S/N</u>	<u>SUB-COMPONENT</u>	<u>YR 1</u>		<u>YR 2</u>		<u>YR 3</u>		<u>TOTAL</u>	
		<u>2004</u>		<u>2005</u>		<u>2005</u>			
		<u>Apprai</u> <u>sed</u>	<u>Appr</u> <u>oved</u>	<u>Appra</u> <u>ised</u>	<u>Appr</u> <u>aised</u>	<u>Apprais</u> <u>ed</u>	<u>Approv</u> <u>ed</u>	<u>Apprais</u> <u>ed</u>	<u>Approv</u> <u>ed</u>
1.	Feeds and Nutrition	750	250	450	150		100		500
2.	Animal Breeding/Genetics	1500	500		300		200		1000
3.	Poultry Production	750	250		150		100		500
4.	Processing and Marketing	900	300		300		200		800
5.	Animal Health and Vet. Services	1200	400		350		250		1000
6.	Grazing Reserve/ Stock Routes	1500	500		300		200		1000
7.	Livestock Extension Services	300	100		50		50		200
	Total	2.30	2.30	1,600		1,100			5,000

5.7.4 Implementation

The aspect concerning the formation of a Livestock /Fisheries Marketing and development agency has been successfully started. Also a total of ₦ 100 million was appropriated for the Presidential Initiatives on Livestock in 2004. This represents less than 2.5% of the expected ₦2.3 billion for the year. Even then the fund could not be accessed before it lapsed and so no meaningful implementation was carried out during the year. A total of ₦44.0 million was released for the first and second quarters of 2005 and was utilized for:

- i. rehabilitated and resuscitated 4 Nos. existing livestock breeding centres
- ii. re-stocking 4 Nos. breeding centres with improved breeds (60 animals)
- iii. provision of infrastructure such as boreholes and watering facilities in grazing reserves in the North West, North East, and North Central Zones (6 Nos . boreholes sunk and 5 No. earth dams built; 3 No. earth dams reactivated and 4 Nos. Broken down boreholes reactivated.
- iv. Demarcation of 116 km of stock routes in the North West axis of the transhumance stock route to reduce pastoralists/crop farmers' clashes.

- v. The poultry industry is recovering fast and has now developed to the extent that it is now exploring the possibilities of exports.

Other activities programmed for implementation include:

- i. procurement of CBPP vaccines, syringes and needles
- ii. development of Grazing reserves and Stock routes
- iii. Procurement of Supplementary Feeds
- iv. Refurbishing and rehabilitation of eleven (11) Breeding Centres
- v. Procurement of Day-old chicks for Family Poultry Programme
- vi. Procurement of Equipment for Livestock Extension Services
- vii. Livestock Processing and marketing Inputs
- viii. vaccination of 10 million heads of cattle in the North
- ix. vaccination of 1.0 million local poultry including vaccine procurement, mounting an enlightenment campaign for the involvement of Rural Women in poultry keeping as part of our contribution to Poverty Alleviation and gender mainstreaming under food security;
- x. surveillance of crop and livestock pests in 10 Frontline States
- xi. Development of additional 156 grazing reserves from the 433 already identified, to increase the number of grazing reserves slated for development to 208 covering a total area of 3,391 hectares.
- xii. Development of 17,032 km of transhumance stock routes and grazing corridors.
- xiii. To achieve 88 million broiler and 30 million layers to produce 170,000 metric tonnes of meat and 350,000 metric tonnes of eggs.

The overview reveals that although the presidential initiative policy is an excellent concept on the livestock sector, which ideally encompassed industrial and rural poultry, its implementation has been problematic, not the least through poor funding and even then the share that accrued to the poultry sector in the first tranche of funds left the poultry sub-sector unattended. Indeed, all these go to show that Nigeria has never been short in support and policy initiatives, the real problem as always is in the funding and implementation of such policies.

CHAPTER SIX

6. OFFICIAL REGULATIONS AND INTERVENTIONS IN POULTRY HEALTH (IN PARTICULAR AVIAN INFLUENZA MEASURES.)

6.1 The Animal Diseases (Control) Decree.

The control of the diseases of all animals in Nigeria are regulated by rules and laws set out in decree No10 which was gazetted in February, 1988, pages A477 to 501. The decree contains the definitions and rules guiding the importation and exportation of animal and poultry products; surveillance and notification of their diseases; compensation policy; duties of Veterinary Officers, Law enforcement agents and the powers of the Minister in the determination of contraventions, etc. The major aspects in relation to this report are as follows:

- The importation or exportation of animals, poultry and their products including; hatching eggs and biologics is prohibited, except under a permit granted by the Director. It provides for manned control and monitoring posts, listed in a schedule and stipulates sanctions for contraventions
- The decree defines the rules for the establishment of a hatchery or a poultry farm of up to 250 birds under licence, demands that such operations must be registered annually (fee N50) and managed hygienically with compliance on vaccination programmes.
- It empowers the Minister to make regulations on the importation, exportation and the management of any disease outbreak of national economic importance by control or eradication measures.
- At the state level, the decree empowers the Directors /CVOs to adopt and apply disease control and related measures , subject to the approval of the Minister or Commissioner.
- Schedule 1 of the decree contains a list of 80 Animal Diseases including 20 poultry diseases, viz:

No 8 Avian Encephalomyelitis	No 9 Avian Infectious bronchitis
No 10 Avian Leukosis Complex	No11 Infectious Laryngotracheitis
No 22 Coccidiosis	No 27 Chronic Respiratory Disease
No 30 Duck Plaque	No 31 Duck virus hepatitis
No 43 Fowl Cholera	No44 Fowl Plaque
No 45 Fowl Typhoid	No 47 Gumboro disease
No 52 Infectious coryza	No 53 Influenza and Parainfluenza
No.57 Marek's disease	No 62 Newcastle disease
No 64 Pox diseases of all spp.	No 65 psittacosis and Ornithosis
No 70 Salmonella infections (...S.pullorum)	No 79 Tuberculosis (Bovine and Avian)

There are well-articulated provisions for compensation with regards to animals slaughtered for disease control purposes. However, the relevance of the provisions to poultry is less obvious or subsumed under generalised frameworks for animals, hides and skin.

Schedules 4, 5 and 6 contain the design of the Import Permits while Schedule 10 shows the format for the Farm/Hatchery Establishment Licence.

6.1.1 Technical Overview of the Decree

The decree was established in 1988 and it is comprehensive and explicit. However, it is obvious that many core areas of the decree have lapsed out of relevance to a dynamic sector such as livestock and poultry health. The most glaring examples of such lapses include:

- The definition of size (250) of poultry and hatchery to be registered
- The penalty of N50 for contraventions.

- The list (context and specificity) of poultry disease; Nos 44& 53, for example.

There are many important poultry disease which have been globally recognised or reclassified in decades after the advent of the 1988 decree. For instance, the globally adopted name for Fowl plaque which has removed the lopping together of two Myxoviral disease entities are Newcastle disease for the Paramyxoviral disease and Avian Influenza for the Orthomyxoviral counterpart. The two diseases have important epizootiologic and economic differences, which can no longer justify their location in the vague bracket of Fowl Pest – a terminology that derived from the early part of the last century. It is therefore obvious that a total review and up-date of Nigeria’s Animal disease regulations is urgently necessary. Indeed, the emerging pre-eminence of the poultry sub-sector under the impetus of the current Avian Flu epidemic should help focus greater attention on the sub-sector in the new Animal Diseases Edict /Regulations. The responses to efforts of the FGN on the management of the flu epidemic in Nigeria, gives hope for such positive dispensations in the sub-sector.

6.2. Management of Avian Influenza Outbreak in Nigeria.

The geographic spread of the current Avian Influenza (AI) pandemic started in the later part of 2003 in Southeast Asia and moved eastwards to Europe during 2004 to 2005. It was more logical to expect it to continue further eastwards into Europe or perhaps jump across the Mediterranean into Libya, Egypt or other contiguous countries in North Africa. It was therefore rather a surprise in the trend, that it was first encountered or reported from Africa in Nigeria. Some of the enabling factors to the early cue in the diagnosis of AI in Nigeria are partly traceable to the following:

6.2.1 Pre-epidemic Background in Nigeria.

With the global alert on H5N1 AI, the pre-epidemic activities in Nigeria included:

- Preliminary proposal to FGN by a team of subject specialists based in the University of Ibadan, early in 2004.
- ABU/FVM: A Colloquium on Bird Flu in Ahmadu Bello University, Zaria invited a multi-disciplinary team of experts to make contributions which were published with a copy sent to the Hon Minister of Agriculture in December. Adene,et al.(2005).
- FGN : 1. Inter-Ministerial Expert Committee on Flu subsequently in early 2005
 - 2.The Health Sector Technical Advisory Committee, Dec 2005
 - 3.Technical Committee of Experts, in Fed Livestock Dept., Dec 2005
- These two committees which were primarily concerned with the medical and agricultural sectors respectively, promptly submitted separate preparedness documents to FGN in December, 2005
- Poultry Industry and Investors under the forum of Poultry Association of Nigeria (PAN), made some mild attempts to overtly focus on the pre-epidemic stage but rose more stoutly to the challenges when the epidemic was eventually reported.
- MEDIA : The print and electronic media were generally active in giving space and time for publicity from all the above mentioned sources.

6.2.2 Preparedness Plans in Nigeria

Although the two earlier mentioned committees submitted what could be regarded as good preparedness plan dossiers which included operational logistics and material requirements to FGN promptly in Dec, 2005, the **arrival** of the epidemic so soon after, through a signalling diagnosis from ABU, Zaria in Jan, 2006 appeared to have caught the country by surprise and rather unprepared. There was hardly any time to study, adopt and procure logistic

requirements. The requisite preparedness training of field staff etc could hardly be done and so panic was therefore inevitable in the circumstances. However with the rather emphatic policy stance of FGN, national and international efforts were speedily mobilized to put a concerted response programme to replace the initial panic.

Plans were immediately evolved to send samples to the national Veterinary Research Institute (NVRI) where the appropriate containment virologic facilities were available, for further investigation and laboratory confirmation. After the preliminary tests in NVRI, specimens were forwarded to Padua, Italy for the typing and sub-typing of the virus. A confirmation of H5N1 bird flu in Nigeria came from the reference laboratory on the 7th Feb, 2006.

6.2.3 Poultry Sector and Public Reactions

There was palpable fright and frustration from economic implications on poultry production. The responses from the various stakeholders include:

- Small-scale (rural poultry) operators were scared by the danger of losing source of family livelihood
- Large commercial operators bemoaned the looming loss of their investment capital.
- Employees were grieved by the helplessness in the face of impending lay-offs.
- Consumers progressively abandoned patronage of poultry meet and eggs and opted for fish, beef and other substitutes, with attendant cost implications from demands.
- Producers and marketers of poultry products lost a good chunk of sales and incomes.
- The Poultry Association of Nigeria (PAN), Poultry Marketers Association with active support of the media as well as some professional associations like the Nigerian Veterinary Medical Association (NVMA),
- World Poultry Science Association (WPSA,Nig) also hosted public enlightenment seminars and lectures in locations across the country.

The municipality of Jos in Plateau State was one of the places to be caught in the bird flu epidemic. There were losses in the poultry population in terms of mortality and slaughter of poultry. The following Tables reflect the changes in poultry as stock holdings and as market commodity as at June ,2006. Thus, there was a depletion ranging from 33 to 100 % in sampled farms, about 50 % in feed mill out-put, while a maximum of 50 and 20 % were observed in the domestic fowl and guinea fowl markets. The depletion in a major local Suya (barbecue) spot was between 37 and 50% over the period.

Table 6.1: Structure of Response To HPAI in Jos Environ (Production)

FARMS	Layer Poultry Stock		Feed Mills (tonnes)	
	Pre-HPAI	Current	Pre-HPAI	Current
Agro Kaffin Hs	30,000	nil	40	20
Danladi Auyo	20,000	< 10,000	5	?
Fulata Dutse	15,000	< 10,000	?	?
Babangida	1,000	nil	?	?
(Range % Depletion) = (33.3 to 100)			(50 ?)	

Source: NVRI, July,2006

Table 6.2: Structure and Response To HPAI in Jos Environ (Market Daily Estimates)

MARKET	D. FOWLS		G. FOWLS		DUCKS		PIGEONS	
	Pre	Now	Pre	Now	Pre	Now	Pre	Now
Babara	2000	1000	-	-	500	280	500	200
Maigatari	4000	2500	2500	2000	1000	600	400	100
Gujungu	5000	3000	2000	2000	500		500	150
(Range %Depletion)	(37.5 to 50)		(0 to20)		(0 to 44)		(0 to 75)	
SUYA Depo 1	600	350	NA		NA		NA	
..... 2	500	250						
... .. 3	800	400						
(Range % Depletion)	(25 to 50)							

Source: NVRI, July 2006

6.2.4 Aspects of Bird Flu Emergency & Management Responses in Nigeria.

The responses consisted not only of the general stereotypes but also customized components to suit the local demands. FGN proclaimed a slaughter and eradication policy for the *stamping - out* of the flu epidemic. Responses were targeted on the following:

- Poultry operations: enlightenment campaigns on intensified preventive biosecurity; detection and reporting; slaughter/depopulation, disposal and decontamination procedures; etc
- Slaughter policy but no vaccination was not officially adopted:.
- Poultry products as food: handling and kitchen safety precautions.
- The scientists especially those in the Universities called for multi-lateral and comprehensive surveillance strategy and implementation that will be a pro-active epizootiologic tracer.
- The command chain appeared top-heavy and over-centralized, with minimal States, LG and peripheral or grassroots involvement. Commercial poultry farms instituted a ‘*red alert type*’ sanitary (bio-security) precaution. Movements in and out of farms were placed under strict control and hygienic precautions.
- The less structured rural poultry sector appeared less compatible with these programmes and was therefore rather side-lined.

6.2.5 Current Status and Trends in Flu Outbreaks

Bird flu outbreak in Nigeria *initially and simultaneously* involved two contiguous states (Kaduna & Kano) in the northern part of Nigeria, from where it spread in a matter of few weeks to six other states in the Middle belt and North. Outbreaks were subsequently reported in the southwest, from a few farms in Ogun and Lagos states (the commercial poultry headquarters in Nigeria) and then from Anambra state in southeast of Nigeria in March/April. As at May 2006, outbreaks have been reported from 14 states covering 32 LGAs (Table 6.3 & Fig 6.1.). The spread was initially rapid despite the slaughter/stamp-out programme but it conspicuously slowed down in April, which coincided with the ingress of the hot season in the northern epi-centre. Thereafter, only few sporadic outbreaks involving mainly small scale operations in the North were reported. However, as at June 2006, a few more outbreaks

were reported in the southwest (Lagos State) from two commercial farms. Generally, the worst victims were in the poorly managed poultry farms while the larger *bio-security-alert* commercial farms have so far, had minimal encounter with the epidemic. This is an aspect, which deserves to be empirically examined. The initial involvement of local (*indigenous*) chickens in Katsina state, appears to have been followed recently with another outbreaks in Taraba state. It is not clear if this is truly representative of the status of the susceptibility to the epidemic in this category of poultry.

Table 6.3. Monthly Summary of HPAI Reports In Nigeria (Jan to June, 2006)

	JAN	FEB	MCH	APR	MAY	JUN
Number of States Suspected	6	20	20	10	10	9
Number of LGA Suspected	7	34	40	22	12	13
Number of Cases Suspected	23	126	93	73	51	71
Cases Positive	7	50	21	15	9	7
% Positive	30.4	39.7	22.6	20.5	17.6	9.9

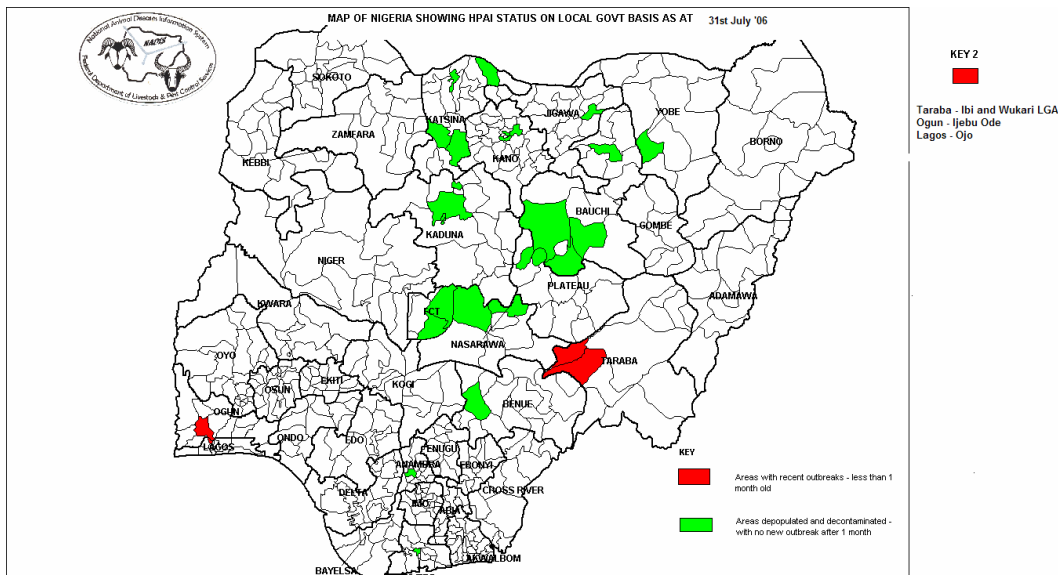
Source: NVRI, 2006

6.2.6 Compensation Programme

The slaughter policy adopted for the eradication of the disease in Nigeria necessitated a contingent compensation programme. The objective was to help ameliorate the losses without pretext to full-scale payback of costs of the slaughtered birds. This policy generated mixed reactions amongst stakeholders, leading to incomplete compliance by some of them. Necessary logistics were evolved to document the details in each affected farm. Table 6.4 presents the summary of the payouts in this programme.

1. Total Allocation to the containment of the epidemic **₦ 2.00 billion**
2. Total Expenditure in tackling the epidemic **₦ 200.00 million**
3. Number of States affected is 13

Figure 6.1. Epidemiological Map Showing the Locations of AI outbreaks in Nigeria.



Source: FLD, 2006

Table 6.4: FGN's Allocation on Avian Influenza

S/No.	States	State Poultry Population (2005)	No of farmers	No. of LGA affected	Type of birds	Bird population Of the affected farms	No. Dead	No. depopulated	Amount for Compensation (₦)
1.	Anambra	82,876	1	1	L	500	500	0	
2.	Benue	1413402	2	1	L/Hy		NA	NA	
3.	Bauchi		6	2	Layers	147,782	63,654	84,128	21,032,000.00
4.	Abuja, FCT	45,205	3	3					
5.	Kano	226,024	58	10	Mixed	---	77,465	143,375	35,638,250.00
6.	Kaduna	188,353	59	3	Mixed	113,798	76,149	37,303	13,481,500.00
7.	Katsina	180820	4	2	Layers	N/A	N/A	4,071	1,017,750.00
8.	Lagos	663,100	1	1	Layers	18,050	14,361	3,689	942,250.00
9.	Nassarawa	650,948	517	1	L/Hy	9,817	1055	8306	3,141,000.00
10.	Ogun	403899	1	1	Layer	125,000	39,793	85,210	21,304,750.00
11.	Plateau	789,576	13	2	Layer	54,358	12,053	42,305	10,576,250.00
12.	Rivers	206,985	1	1	Layer	N/A	N/A	N/A	
13.	Yobe	182,957	2	2	Layer	N/A	N/A	N/A	
								331,865	

Source FLD, 2006

6.2.7 International Support

The global importance of AI epidemic is evident in the support, which Nigeria received from International bodies. Table 6.5 presents an overview of donor support for tackling the AI epidemic in Nigeria.

Table 6.5.:Pledges from International Bodies.

World Bank -	\$ 50 million PPE = 1425 units supplied	USAID:	\$ 25 million
FAO:	PPE 5655 units Disinfectant (750 litres)	DFID/WHO :	PPE (7000 units)
CDC, USA :	Training Laboratory personnel and Upgrading of NVRI laboratory facilities to characterize HPAI viruses		
Thomas A Gioanis :	Chairman American Board of Healthcare Law & Medicine 2,500 liters of Disinfectant		
People Republic of China:	Equipment and Medicine for Artificial Insemination (AI)		

6.2.8 **Implications of AI in Nigeria for the Rural Poultry Sector and its Genetic Base.**

Although the effects and economic and public health implications of the AI epidemic on the Rural Poultry sector needs to be assessed, there are reports of losses in the sector through AI mortality and collateral slaughtering.

One main cause for concern about the current H5N1 avian flu is in the evidence that it has crossed the species barrier and become infective to humans. In the typical rural and peri-urban settings in Nigeria, it is known that humans live in close proximity with their poultry, while poultry and pigs both share the same or close husbandry ecology. It is not unusual for rural poultry to enter the abodes of their keepers for food crumbs in the day time or for rest at night time. Children are fond of pet-plays with family chickens while marketers do not only handle chickens closely and regularly but are indeed known to rest in proximity with the chicken baskets or for brief naps during day-long market periods.

There is pre-2005 serologic finding by scientists in Ibadan, Nigeria(Adeniji, et al.1993; Owoade,et al.2002) on infections of type A influenza viruses, including H1N1and H5N1 in Nigeria's poultry and pigs which may afford potential linkages. to historical profile of the disease in the country. With these reports which may serve to confirm older preliminary unpublished *clinical records* on bird flu (Adene,1984;1986 Unpublished) it seems impossible to rule out low grades flu virus activities in Nigeria's industrial and rural poultry, which predates the current H5N1 epidemic. These and other technical questions deserve empirical consideration and investigations for answers.

6.2.9 **Slaughtering for a the Stamping-out of AI**

In Nigeria, a stamping-out policy looked good at the onset. However, the dynamic nature of the disease should be allowed to influence the trend of control programmes, with time. There are arguments for and against the adoption of vaccination for the control of bird flu in Nigeria. The peculiarities of the typically small family/rural poultry flocks will demand some special considerations, in terms of dose-package, shelf life or stability, route of application and even the accessibility to such range-inclined mini-flocks

The impacts of current control measures need to be scientifically assessed while the best comprehensive vaccination options and packages for all sectors of the poultry in Nigeria should be similarly designed.

6.2.10 Implications for the Rural Poultry structure and Genetic base

It is useful to remember that the rural poultry or family flocks are not only important from the point of being integral to the global poultry population but more especially as the poultry of the 70% or more (rural) population in the developing countries of Asia and Africa. This indeed therefore sums up the reasons why the rural poultry sector should deserve a better-defined and proactive engagement in the management of such a massive threat like the current bird flu. For now, it would seem that the rural poultry sector is surviving largely on its innate resilience. It is conceivable that the bird flu situation will not be static, as explained in the preceding sections here. It is not impossible that, the flu epizootiologic equation will eventually lean towards any one of the two sides (advance or regress) or even force a state of equilibrium and become more and more endemic in certain host populations. Such an important sector like rural poultry should not be ignored or exposed to the grave prospects of decimation through endemic bird flu and the consequences of poverty aggravation for the rural poultry owners.

It is becoming increasingly appreciated that the exploitable genetic potential of existing strains of commercial hybrids in the industrial poultry sector has reached its plateau. Geneticists have advocated a resort to the preservation of the un-tapped genetic resources in the germ plasm of indigenous poultry world-wide. In Nigeria, previous works have shown that Nigeria's indigenous poultry can be improved through selection and breeding. Similarly, the presence of basic evidence of certain allotypes or their analogues defining productivity or resistance to disease may be present in rural poultry birds. (Nwosu, 1990; Adene, 1990).

It is perhaps a long-standing viewpoint on this that encouraged FGN to include plans for a Poultry Breeding Centre in its Livestock Improvement Plan. Unfortunately, there is little or no sustained effort especially in terms of current and pro-active research in this direction. It is a subject of global interest and so it should be possible to generate some bilateral or even multilateral research theme on the study and exploitation of the genetic resources of indigenous poultry stocks in Nigeria and Africa.

CHAPTER SEVEN

7. **BIBLIOGRAPHY OF RECENT PUBLICATIONS ON NIGERIAN POULTRY SECTOR**

The terms of reference requires this report to contain “a comprehensive bibliography including all relevant publications and reports that describe the level and type of production and the production systems”. A comprehensive set of publications has been assembled, which as a matter of fact, does not represent all publications on the Nigerian poultry sector in the last five years.

The bibliography assembled, which runs into over 30 pages, has been categorised into six groups as follows:

- Diseases:
- Feeds and Nutrition
- Economics & Statistics
- Husbandry and Management
- Avian Influenza
- Household. Food Security

The bibliography is represented in Appendix 3.

CHAPTER EIGHT

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

The key conclusions arising from the study are presented as follows.

1. The four sector classification of poultry enterprises which emphasises the level of bio-security is not entirely applicable to the Nigerian environment especially as it relates to sector 4: Backyard or village poultry. At the moment the range of poultry being kept at backyard in Nigeria varies from completely free-range subsistence poultry with a flock size up to 30 to intensive, housed and totally restricted commercial-oriented poultry with a flock size varying from 50 to 500.
2. The poultry industry in Nigeria is currently dominated by the large-scale integrated farms in terms of strategic position in the industry, product range and volume of operations
3. The commercial poultry in Nigeria is largely private sector driven. The government only provides policy support.
4. Household poultry flock size appears to be larger on the average than in the previous decade probably because of some elements of commercial poultry being introduced into it.
5. There appears not to be a clear-cut definition of what constitute household poultry and flock. The grey areas include the definition of the term household
6. There is no recent well structured study yielding information on the Nigeria poultry sub-sector
7. Contribution of poultry to household food security is very significant if local production is taken as an indicator of consumption.
8. The contribution of the commercial poultry to household food security is far greater than that of subsistence poultry given the different productivities and off take rates.
9. There is a decline in poultry products imports in last few years.
10. The total value of the poultry sub-sector is very significant
11. The introduction of fast foods outlets into the marketing system in recent years has facilitated access to well-processed and better culinary presentations of poultry products thereby enhancing poultry products consumption.
12. There is currently no monitoring and certification of poultry meat processing and there are no quality criteria in place.
13. There are no effective hatchery monitoring and certification protocols in place.
14. There is a good number of old and recent Federal Government policies and programmes in place but most of them are ineffectively implemented with respect to the poultry sub-sector
15. There are signs of active response to and management of HPAI epidemic in Nigeria but the control options (eradication versus vaccination) need to be re-evaluated for more comprehension and lasting benefit
16. Considering the numerous often inaccessible foci of rural poultry in Nigeria, a special consideration is required for an effective control of HPAI in this group of poultry to minimize the implications for the economy and public health.

8.2 Recommendations

The following recommendations are made in furtherance of the objectives of this study.

- 1) Comprehensive and well-designed study of the poultry sub-sector should be carried out. The study should be divided into two components namely commercial poultry and

household poultry. Prior to carrying out the study, proper definition of household poultry within the Nigerian context should be established such that whatever is not captured as household poultry is captured as commercial even if it is situated at the backyard.

- 2) Standard protocols for monitoring and certifying poultry meat processing plants should be established.
- 3) Standard protocols for effective hatchery monitoring and certification should be developed and implemented.
- 4) Re-evaluate the options for the control of HPAI with a view to determining which of the two options (eradication and vaccination) will provide more comprehensive and long lasting benefits.

MAJOR REFERENCES CITED.

1. Adene, D. F. (2000). Action Plan – For poultry Animal Health In Pilot Scale Study Under FGN/FAO/TCP/NIR/7822. 81 pgs.
2. Adene,D.F. (2004): Global dimensions in poultry health problems: Regional / National Perspectives. In Poultry Health and Production. Stirling-Horden Publishers Nig. Ltd. ISBN (978-032-156-X) : 221-228.
3. Adene, D.F., E. C. Okolocha and A. Z. Hassan (2005): Summary and Resolutions on Avian Flu Colloquium at Ahmadu Bello University,Nigeria (Dept. Veterinary Surgery & Medicine, 5pgs.
4. Adegbola,A.A.(1990).Indigenising the Poultry Industry in Africa. In Proc. Intn Workshop on Rural Poultry In Africa. Ed E. B. Sonaiya. ANRPD-FAO-IDRC-CTA. Publisher –ANRPD –Thelia House, Ife, Nigeria.Pgs 19 -23.
5. Adeniji, J. A., F. D. Adu, S. S. Baba, G. O. Ayoade, A. A. Owoade and O. Tomori (1993): Influenza A and B antibodies in pigs and chicken population in Ibadan Metropolis, Nigeria. Tropical Vet. 11: 39-45.
6. Otchere, E.O.,A.T.Adeoye, J.O.Gedfu, and A. A. Adewuyi (1990).Preliinary observations onVillage Poultry Productopn,North Central, Nigeria. In Proc. Intn Workshop on Rural Poultry In Africa. Ed E. B. Sonaiya. ANRPD-FAO-IDRC-CTA. Publisher –ANRPD –Thelia House, Ife, Nigeria. Pgs 196 -200.
7. Sonaiya, E. B. and V.E.Olori, (1990). Village chicken Production in SW.Nigeria. In Proc. Intn Workshop on Rural Poultry In Africa. Ed E. B. Sonaiya. ANRPD-FAO-IDRC-CTA. Publisher –ANRPD –Thelia House, Ife, Nigeria. Pgs 243 – 247.

APPENDICES

APPENDIX 1: TERMS OF REFERENCE

National Consultant

Poultry Sector Analysis: The impact of animal disease on production systems and market structure

Job description

Under the technical supervision of the Chief of the FAO Animal Production Service (AGAP) and the operational supervision of TCEO, the national consultant will prepare a desk review of the poultry sector in Nigeria. This review will be used for further investigation on either the epidemiology of Avian Influenza and/or other poultry disease or socio-economic impact.

Based on statistical data, reports, literature information and, if required interviews with key stakeholders, the report will provide a 5-year overview of developments in the poultry sector, including a review of the different poultry production systems, evolving marketing chains, the role of poultry on rural livelihoods and household food security, and policy/economic factors which have contributed to changes in the sector. While the main focus of this review should be on the status and developments during the past five years, historic information should only be included as far as they are required to understand the present situation.

The length of the paper should be 4500-5000 words and the content, in agreement with the responsible FAO officers (AGAP/AGAL), in a format suitable for publication by FAO. The paper would be provided in electronic format (MS Word).

Working title: The structure and importance of the commercial and village based poultry industry in Nigeria.

Sections of the report:

1. Description of numbers, and level of production for all relevant poultry species during the past five years. Analysis of the information with respect to numbers and production in the main administrative units (Provinces) and the various sectors (according to the FAO classification into the sectors 1-4). This should include detailed information on location and type of production systems, size of operators, types of poultry species. Maps/tables should be provided which easily portray location/size of holdings and regional densities of poultry flocks. If maps are not available, tables will be provided so the maps will be done in a later stage in FAO H.Q. Important to provide numbers by production systems and species at level of districts.
1. Information about the numbers of poultry operations in the different sectors. Number of farms or estimates of numbers of families keeping the different poultry species.
2. Description of the main characteristics of the different production systems with respect to husbandry practises, animal health measures and marketing channels.
3. The role that poultry plays in household food security should be discussed. This should draw from any reviews of household expenditure surveys which have been undertaken in the country.
4. Description of Government support programmes for the poultry sector, community based development activities for sectors 3 and 4, and any donor development activities related to poultry.
5. A comprehensive overview of the marketing structure for poultry over the period should be provided, focusing on the different types of supply chains which have evolved in response to growth in demand. Provide an overview of the market players, the number and location of formal abattoirs, the mechanisms on how poultry is produced and transported in the formal/informal sector. A review of prices developments over the past 5 years should be presented, including monthly retail/wholesale prices over the period.
6. Provide an informal assessment of consumer responses to recent animal disease outbreaks and recent producer responses to animal disease outbreaks.
7. Review and description of official regulations and interventions to control poultry animal health (in particular AI measures) and to support the development of the poultry sector.
8. Preparation of a comprehensive bibliography including all relevant publications and reports that describe the level and type of production and the production systems.

APPENDIX 2: SELECTED COMMERCIAL POULTRY FARMS
JUNE, 2006

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (LAGOS STATE)		
S/N	NAME	ANNUAL D.O.C. PROJECTION
1	OLOGUN FARM	5,000
2	OCHIOBI FARM	5,000
3	FABAK FARM	9,000
4	NEW EARTH FARM	20,000
5	BEN-K FARMS	10,000
6	FASASI FARM	10,000
7	BUSYVICE FARM	8,000
8	CORA FARM	8,000
9	TONBOL FARM	5,000
10	MARTAY FARM	2,500
11	OLABOSCO FARM	90,000
12	GOODHEALTH FARM	60,000
13	TADE TAIYE FARM	30,000
14	FIRM FARM	20,000
15	DECEMBER FARM	40,000
16	ILOTI FARM	20,000
17	DUTEL FARM	25,000
18	S&S FARM	10,000
19	OLA FARMS	20,000
20	BOLAB FARM	2,000
21	DAODU FARM	5,000
22	DR. MRS JOHNSON	5,000
23	BAFORT FARMS	5,000
24	LAWAL FARMS	2,500
25	SOUTHERN HERITAGE	2,500
26	SACHEL FARM	2,500
27	DELE FARM	2,500
28	ZIONHILL FARM	4,000
29	ADAMORE NIG. LTD	24,000
30	SHARP CORNER FARM	5,000
31	MULTI-ACCESS FARM	5,000
32	DAN FARMS	2,500
33	BM AGRO	5,000
34	MUSTARD SEED	2,500
35	OJEAGA FARM	2,500
36	A.A ODUNLAMI	2,500
37	RITLAB FARM	2,500
38	LEGACY FARM	2,500
39	UKIDY FARM	2,500
	TOTAL	485,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (EKITI, ONDO, DELTA AND EDO STATES)		
S/N	NAME	Operation Capacity
1	JOF IDEAL FAMILY FARMS	60,000
2	JOFA FARMS	40,000
3	ADEGOKE FARMS	15,000
4	ABRAHAMSUM FARMS	10,000
5	Mrs Ojo, (Principal)	5,000
6	PROVIDENCE FARMS	3,000
7	IGBINO FARMS	40,000
8	IGHODALO FARMS	20,000
9	EMMA TEGHELI FARMS	20,000
10	DORA JOY FARMS	15,000
11	OLONIMOKE-ADE	25,000
12	GOD BLESS FARMS	2,500
13	HENRY MILLER NIG LTD	20,000
14	DR. OSABI	15,000
15	EMAT FARMS	15,000
16	ENROPEE FARMS	5,000
17	OKUNBOR FARMS	3,000
18	PROGRESS FARMS	5,000
19	FASORANTI FARMS	2,000
20	MRS OGUNSUYI % JOFA FARMS	3,000
21	MRS FALOPE % MRS ADEGOKE	3,000
22	DR. OMOTOSHO	1,500
23	IFE SOUTH EAST FARMS	3,000
24	ORNAMENT OF GRACE	1,500
25	MRS OLUDE	3,000
26	DR. OBAGIE	1,000
27	ENWEREM FARMS %PROBCAR AGRIC	3,500
28	OKUNBOR SNR. % PROGRESS AGRIC	3,500
29	EGHAREFA FARMS IPKOBA SLOPE % EFO AGRIC	3,500
30	ADA FARMS % EFO and PROSCAR AGRIC	10,000
31	OYAKILOME FARMS %AKIOBWE	5,000
32	PROGRESS AGRIC AGENCY	100,000
33	EFO AGRIC	60,000
34	PROSCAR AGRIC	60,000
35	DR ATIRI	40,000
36	MAFURU LIMITED	40,000
37	TUTU VET CONSULT	30,000
38	VET VENDORS	80,000
39	ANIMAL DOCTOR	

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (EKITI, ONDO, DELTA AND EDO STATES)		
40	RUSELF / KESSAG	
41	SONNY EBOH	15,000
42	GOD DEY FARMS	60,000
43	FUNMILOLA FARMS	40,000
44	CROWN FARMS	40,000
	TOTAL	927,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (OYO, OSUN AND KWARA STATES)		
S/N	NAME	ANNUAL D.O.C. PROJECTION
1	MIRTH AGRIC FARMS	60,000
2	FEED NATION	45,000
3	HI-FLO FARMS	40,000
4	DOLIL FARMS	20,000
5	ABIOLA ADIO FARMS	30,000
6	FOLAWIYO FARMS	120,000
7	J.C.L FARMS	80,000
8	OYEWONUOLA FARMS	45,000
9	GRACELANDB FARMS	15,000
10	ARICA FARMS	20,000
11	DIDVET NIG LTD	Drugs
12	HANDEM FARM	10,000
13	ADEROUNMU FARMS	15,000
14	POSAK FARMS	10,000
15	OODUA FARMS	6,000
16	K. FARMS	8,000
17	TOLUDEX FARMS	40,000
18	ABOGUNDE FARMS	8,000
19	OLA-OLU FARMS	10,000
20	HARMONY FARMS	8,000
21	AJAYI FARMS	8,000
22	OAA FARMS	10,000
23	OLLAN FARMS	8,000
24	AFTCOM NIG LTD	-
25	TOPEX FARMS	10,000
26	GLOBAL WEST FARMS	20,000
27	TOMSEY/RESCUE FARMS	
28	OSAS TWINS	10,000
29	CANNA FARMS	
30	NISSI FARMS	20,000
31	JOLAOLUWA FARMS	5,000
32	AJIKE POULTRY FARMS	2,000
33	FARM SUPPORT SERVICES	-
34	HOPE POULTRY FARM	-
35	COPPACK FARMS	16,000
36	OLAYEMI FARMS	20,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (OYO, OSUN AND KWARA STATES)

37	BAMIDELE FARMS	15,000
38	NIKLOL FARMS	6,000
39	SAGO FARMS	10,000
40	ADEBIYI FARMS	4,000
41	SAMTAD FARMS	10,000
42	WILLIAM FARMS	4,000
43	CDI FARMS	5,000
44	VICTORY FARMS	12,000
	TOTAL	791,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (OGUN STATE)

S/N	NAME	Operation Capacity
1	AYOKUNLE FARMS	250,000
2	ANIMAL CARE SERV. KONS.	100,000
3	SHOBOWALE ANIMASAHUN	120,000
4	RABIU FARMS	35,000
5	GAFO FARMS	25,000
6	STELLAN FARMS	50,000
7	LIZPAD POULTRY	25,000
8	ZIMI FARMS	30,000
9	OSTAN FARMS	20,000
10	ERIKU FARMS	50,000
11	TOPSPEED	30,000
12	OWONOKO FARMS	25,000
13	ALESINLOYE FARMS	18,000
14	OLUYEMI FARMS	12,000
15	AKIN SATERU FARMS	15,000
16	NOTA FARMS	20,000
17	DR DAIRO FARMS	10,000
18	OLUBISI FARMS	12,000
19	BIMBA AGRO	25,000
20	AJOSE FARMS	25,000
21	KATHY FARMS	10,000
22	F.A FARMS	20,000
23	MYTIN DREHER	5,000
24	AKANDE FARMS	7,000
25	RAO FARMS	10,000
26	SJ FARMS	15,000
27	GOLDEN YOLK FARMS	14,000
28	OLUWASOMI AJAYI FARMS	8,000
29	SANNI LUBA FARMS	6,000
30	BARRY FARMS	3,000
31	KLOT MARKETING	5,000
32	ALH HAMZAT FARMS	3,000
33	WALTAJ POULTRY	4,000
34	ALL TRUST FARMS	6,000
35	STRAGAS	4,000
36	BERACHA FARMS	5,000
37	KAZIM POPOOLA FARMS	5,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (OGUN STATE)		
38	FEMI AJAYI FARMS	5,000
39	AKIN FARMS	4,000
40	NENARO FARMS	3,000
41	WUMITOLA FARMS	4,000
42	RETAWEM FARMS	6,000
43	HOSSANNAH FARMS	3,000
44	FODAKS FARMS	4,500
45	OGUNNUPEBI FARMS	2,500
46	DR OYETOYE FARMS	1,000
	TOTAL	1,060,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (SOUTH-SOUTH/SOUTH-EAST)		
S/N	NAME	Operation Capacity
1	RALPH VET SERVICES	10,000
2	DAVID-VET	20,000
3	LAGROMED VET	20,000
4	OGBAJIMI FARMS	20,000
5	MOOS FARM	5,000
6	DILIFY FARM	3,000
7	N&N FARM	5,000
8	U.O.O FARM	15,000
9	ABIODUN EDUN	20,000
10	RAC-CHIGEL	20,000
11	NEXT INVESTMENT	
12	UNFAILING VET	60,000
13	NEWIET AGRO	60,000
14	GRACIB FARM	10,000
15	AUSTIN FARM	10,000
16	RAN KAY FARM	20,000
17	PALMARK AGRO	100,000
18	PETER SUMMER	5,000
19	JEFF-CON FARM	50,000
20	EM-FARM	50,000
21	CENA VET	5,000
22	APAKA FARM	5,000
23	BROTHERS OF ST. STEPHEN	3,000
24	OWELLI FARMS	5,000
25	OZOKWOR FARM	50,000
26	PHINOMAR FARM	100,000
27	NEBO FARM	70,000
28	UKWUOWO FARM	5,000
29	FAVOURS FARM	5,000
30	BANC FARM	10,000
31	CHIEF OWOH FARM	15,000
32	COSIN VET	60,000
33	ALPHA POULTRY FARM	60,000
34	CALIMAX	5,000
35	1ST TROPICAL	20,000
36	MALIBEK	30,000
37	ANIMAL HEALTH	10,000
38	CANDID VET	10,000
39	ZION LIVESTOCK	60,000
40	PAMALOW W.A	20,000
41	W.S ENENDU	10,000
42	OLORUNOSUN	10,000
43	GOFONS VET	10,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (SOUTH-SOUTH/SOUTH-EAST)		
44	NJ AGRIC	30,000
45	IGWE FARM	5,000
46	BIECON FARM	10,000
47	IBRACHO FARM	5,000
48	PATOKS FARM	20,000
49	VICTORY FARM	10,000
	TOTAL	1,161,000

SELECTED POULTRY FARMS IN SECTORS 2 AND 3 (NORTH)		
S/N	NAME	ANNUAL D.O.C. PROJECTION
1	MEEZA FARMS	25,000
2	YELWA FARM	30,000
3	FANASSON INVESTMENTS	45,000
4	NANA FARM	5,000
5	ABU TURAB FARM	
6	ABUBA FARM	
7	GOKRA FARM	
8	CITY SIDE FARM	
9	DAYIJA FARM	
10	DALA FARM	
	TOTAL	105,000

APPENDIX 3: BIBLIOGRAPHY OF RECENT PUBLICATIONS ON NIGERIAN POULTRY SECTOR

DISEASES

1. Abdu, P. A., A. M. Wakawa, and L. Sa'idu, 2005. Avian influenza: A review. *Nigerian Veterinary Journal*, 26(1):34-43
2. Abdu, P. A., L. Sa'idu, and M. Wakawa, 2003. *Manual of Poultry Diseases*. (ABU Press PLC), 50 pp (Submitted)
3. Abdu, P. A., L. Saidu, and A. M. Wakawa, 2004. Prevention and control of diseases in Nigeria. *A workshop on Improving Resource Production in Nigerian Poultry Industry Organized by the National Productivity Centre*, Kaduna 12th-13th May 2004.
4. Abdu, P. A., M. A. Ibrahim, B. D. J. George, and S N. A. Sa'idu, 2000. Ethno veterinary knowledge and practices on the health and disease of indigenous poultry in Hausa land, *PIWEP* 14-18 August 2000, Kaduna, Edited by Gefu, J. O. Abdu, P. A. and Alawa, C. B. Pp.56-64.
5. Abdu, P. A., Sa'idu. and B. D. J. George, 2002. Diseases of local poultry in Nigeria. *Discovery and Innovation*, 14(1/2):107-118.
6. Abdu, P. A., T. K. Manchang, and L. Sa'idu, 2004. The epidemiology and clinicopathologic manifestations of Newcastle disease in Nigerian local chickens. *Proceedings of the 41st Congress of the Nigerian Veterinary Medical Association*, November, 22-26, 2004, Vom, Nigeria, Edited by Kalejaiye, J. O. Pp. 57.
7. Abdu, P.A and L. Sa'idu, 2001. Veterinarians and poultry farmers' relationship. *Agvet International*, 2(1): 13-14.
8. Abdu, P.A. and L. Sa'idu, 2001. Diagnosis of poultry diseases. Workshop on Poverty Alleviation through Sustainable Poultry Production. Gonob and Associates and Omni- Agik. Arewa house, Kaduna, 25th – 26th July.
9. Abdu, P.A. and J.N. Faya, 2000. Testing the efficacy of some Nigerian plants on helminthes found in local chickens, *PIWEP*, Kaduna, Edited by Gefu, J. O. Abdu, P. A. and Alawa, C. B. Pp. 65-71.
10. Abdu, P.A. and L. Sa'idu, 2000. Common poultry diseases in Nigeria and their control In: *Poultry Production in Nigeria. A Training Manual of the National Training Workshop on poultry production in Nigeria* 1-6 September 2002, Edited by Gefu, J. O. Adeyinka, I. A. and Sekoni, A. A. Pp. 129-145.
11. Abdu, P.A. and L. Sa'idu, 2001. Emerging diseases of poultry. Workshop on Poverty Alleviation through Sustainable Poultry Production. Ganob and Associates and Omni-Agrik. Arewa House, Kaduna, 25th to 26th July.
12. Abdu, P.A., 2005. Evolution of the Pathogenicity of Newcastle Disease Virus and its implications for diagnosis and control. In: Book of Proceedings. WIRP. Ahmadu Bello University, Zaria, Nigeria, Pp.35-52.
13. Abdu, P.A., A.G. Jagun, J.O. Gefu, A.K. Mohammed, C.B.I. Alawa, and A.T. Omokanye, 2000. A survey of ethno veterinary practices of agro pastoralists in Nigeria. *Proceedings of an International Workshop on Ethno veterinary Practice (PIWEP)*. August 14th -18th, 2000, Arewa House Kaduna, Nigeria, Edited by Gefu, J. O. Abdu, P. A. and Alawa, C. B. Pp. 25-37.
14. Abdu, P.A., and A.M. Bashir, 2003. Avian pox in Zaria, Nigeria. *Proceedings of the 39th Annual Congress of the NVMA Sokoto* October 27th- 31st 2002, Edited by Daneji, A. I. Agaie, B. M. Graba, H. S. Olorede, B. A. Umo, O. J. Chafe, U. H. and Elsa, A. T. Pp. 150-154.
15. Abdu, P.A., L Sa'idu, and S. J. Ruwaan, 2002. Some reproductive abnormalities in domestic fowls. *Nigerian Journal of Animal Production*, 29(1):94-101.
16. Abdu, P.A., L. Sa'idu, K. P. Dandam and J. S. Ruwaan (2002). Some reproductive abnormalities in domestic fowls. *Nigerian Journal of Animal Production* 29(1),94-101.
17. Abdu, P.A., J.U. Umoh, S.U. Abdullahi, and L.Sa'idu, 2001. Infectious bursal disease. (Gumboro) of chickens in Nigeria. *Tropical Veterinarian*, 19(4): 216-236.
18. Abiade-Paul, C.U.; Nweze, N.E.; Chah, K.F. and Oboegbulem S.I. (2005). Serological and Bacteriological Detection of *Escherichia coli* 0157 in Chickens in Nsukka, Nigeria. *Proceedings of 30th Annual Conference of Nigeria Society for Animal Production*. 30, 120 –122.
19. Abubakar, M.B., Baba, S.S., and El-Yuguda, A.D. (2005): Seroprevalence of influenza virus types A and B infections in domestic animals in northeastern Nigeria. *Abstract, 42nd Annual Congress, Nigerian Veterinary Medical Association, Maiduguri, Borno State, Nigeria, November 14-18, 2005*.
20. Abubakar, A.A. and Ubosi, (2002). Antibody Response of ducks to Different doses of Sheep Red Blood Cells. *Afric. J. Natr. Sci.* 5:123-124.
21. Addy, E.O.H., Yusuf, M.K. and Mani, A.U. (2001). Studies on the Effects of Restraint Stress on Some

- Haematological and Biochemical Parameters in Quails. Proceedings of the 6th Annual Conference of Animal Science Association of Nigeria. Sept. 17th- 19th, 2001, pp237-239.
22. Adebayo, I. A. (2004): Application of Heterologous Erythrocyte Indicator Systems in the Differentiation of Vaccinal and Natural Newcastle Disease Induced Antibodies. *Int. Jour. Poultr. Sci.* 3 (6): 411-414
 23. Adebayo, I. A., Adene, D F., Tewe, O.M. and Durojaiye, O.A. (2004): Paired Chicken and Mammalian Erythrocyte Indicator Systems for Haemagglutination Test and Rapid Diagnosis of Newcastle Disease. *Trop. Vet.* 22: (1): 23-28.
 24. Adebayo, I. A., Adene, D. F., Tewe, O. M. Durojaiye, O. A. (2004). Paired chicken and mammalian erythrocyte indicator systems for Haemagglutination test and diagnosis of Newcastle disease. *Trop. Vet.* 22 :23 -28
 25. Adebayo, L A., I B Osho, T A M Awoniyi, and A O Adeyanju (2002): A Serological Survey of Newcastle Disease Antibody In Chicks Selected from Six Hatcheries In South West Nigeria. Proc of the 27th Ann. Conf of NSAP. Federal University of Technology, Akure. March 17-21, 2002. 72-73
 26. Adedapo, A.A., A. B. Saba, O. A. Dina and G. M. A. Oladejo (2004) Effects of dexamethasone on the infectivity of *trypanosoma vivax* Y486 and serum biochemistry changes in Nigerian domestic chickens (*Gallus gallus domesticus*). *Tropical Journal of Animal Science* 2004 Volume 7(1) 65-72.
 27. Adedepo, A.A., J.O. Olopade, A.B. Saba, and O.A. Dina, 2004. Effect of corticosteroid administration on the ineffectively of Trypanosome Bruce (8/18) in Nigeria domestic chickens (*Gallus Domesticus*). *Nigeria Journal of Animal production*, 33 (1) 140-144.
 28. Ademola, S.G., G. O. and G. M. Babatunde (2005). Haematological and serum enzyme activities of broilers fed garlic and ginger supplements. *IJAAAR* 1(1), 41-47.
 29. Ademola, S.G., G.O. Farinu, O.O. Adelowo, M.O. Falade, and G.M. Babatunde, 2005. Growth performance and anti-microbial activity of garlic and ginger mixtures fed to broilers. *Nigeria Society of Animal Production*, 30: 71-74
 30. Ademola, S.G., G.O.Farinu, and A.O. Ajayi-Obe, 2004. Effects of *Allium Sativum* and *Zingber Officinale* on the haematology and organ measurement of broiler chickens. Proceedings of the 29th, Annual conference of the Nigerian society for Animal Production, Vol. 29, 2004, held at Sokoto. Pp. 250-251.
 31. Adene, D. F. (2006). Avian Influenza: The Trans-continental Plague. (WPSAS-Ghana , Poultry Seminar) Accra, 11 -14 April, 2006.
 32. Adene, D. F., (2000). Micro ingredient and Premixes in Poultry health and production. *Bio-Organics Nutrients System Ltd; Ibadan. Nigeria. 12 pgs*
 33. Adene, D. F., (2000). Micro ingredient and Premixes in Poultry health and production. *Bio-Organics Nutrients System Ltd; Ibadan.,Nigeria. 12 pgs.*
 34. Adene, D. F., (2000). Poultry Animal Health - Pilot Seale study and Report under FAO-FGN/TCP/NIR 7822 (Smaller holder poultry in food security) 81 pages.
 35. Adene, D. F., (2000). Strategy for an effective control of Marek's disease. *CHII Nig. Ltd/Intrevet Intn. By The Netherlands Seminar; NVMA Congress, Uyo.,Nigeria. 13 pgs.*
 36. Adene, D. F., (2000).*Strategy for an effective control of Marek's disease. *CHII Nig. Ltd/Intevet Intn. By The Netherlands Seminar; NVMA Congress, Uyo.,Nigeria. 13 pgs.*
 37. Adene, D. F., Oluwayelu, D. O. and Oladele, O. A. (2001). National programme policy for the control of avian mycoplasmosis: An example of vertically transmitted transboundary disease problem. In: Proceedings, 38th Annual Congress of the Nigerian Veterinary Medical Association. Badagry, Nigeria. 9th – 13th October, 2001. ISBN 978-8031-24-2.
 38. Adene, D.F. (2005).Improved and tools-independent disease diagnosis in Poultry. Proc. Workshop on Poultry Health and Production Efficiency. *Ahmadu Bello University,Zaria Nigeria, Nov., 2005. Pg10 -21.*
 39. Adene, D.F., 2005. Improved and tool-independent disease diagnostic procedure in poultry. In: Book of proceedings WIRP. Ahmadu Bello University Zaria, Nigeria, Pp. 10-21.
 40. Adene, D.F., A.M.Wakawa, P.A.Abdu, L.H. Lombin, H.M.Kazzem, L.Sa'idu, M.Y.Fatihu, T.Joannis, C.A.O. Adeyefa and T.U.Obi (2006). Clinical, Pathological and Husbandry Features associated with the maiden Diagnosis of Avian Influenza in Nigeria. (*Nig Vet jour. In Press*).
 41. Adene, D.F., E.C.Okolocha, and A.Z. Hazzan (2005). Resolutions on the Avian Influenza Satellite Colloquium; Ahmadu Bello University, Zaria. Nigeria. 5 pgs.
 42. Adene, D.F., Oladele, O.A., Akpavie, S.O. and Lawal, T.W. (2004). Field trial on a Newcastle disease vaccine: An example in quality assurance and lawful marketing. In: Poultry health and production: Principles and practice. Ed. D.F.Adene. Stirling-Horden Publishers (Nig.) Ltd. Lagos. ISBN 978-032-156-X. 271-275.
 43. Adene, D.F., Oluwayelu, D.O. and Oladele, O.A. (2004). Avian mycoplasmosis as a peculiar example of transboundary animal disease. In: Poultry health and production: Principles and practice. Ed. D.F.Adene. Stirling-Horden Publishers (Nig.) Ltd. Lagos. ISBN 978-032-156-X. 213-219.
 44. Agbato, A.O. 2005. Towards antibiotic free poultry farming. In: Book of proceedings WIRP. Ahmadu Bello University, Zaria, Nigeria, pp.134-146

45. Aiki-Raji, C.O. ,O.A. Oladele, and D.F Adene, 2003. Swollen wattles in chickens. A case study. Nigeria Veterinary Journal, 24(3) 19-22
46. Akpavie, S.O., 2005. Major Noeplasm of poultry with special emphasis on the pathology diagnosis and control of Marek's disease and neurosis. J. In : Book of Proceedings.WIRP. Ahmadu Bello University, Zaria, Nigeria, Pp. 53-79.
47. Akpavie, S.O., Adene, D.F. and Ohore, O.G. (2000). Field observations, clinical and pathological manifestation of viral diseases of poultry in Nigeria. Proceedings, 37th Conference of the Nigerian Veterinary Medical Association. 6th-8th November, 2000. Uyo Nigeria.
48. Alawa, C. B. I., A. M. Adamu, J. O. Gefu, O. J Ajanusi,. P. A. Abdu, N. P. Chiezey, J. N. Alawa, and D. D. Bowmam, 2003. In vitro screening of two Nigerian medicinal plants (*Veronica amygdalina* and *Annona senegalensis*) for anthelmintic activity. *Veterinary Parasitology*, 113(2003): 73-81.
49. Ambali, A.G., Abubakar, M.B., Hassan, S.U. and Adene, D.F.(2001). Prevalence of active and passive immunity against Newcastle disease in 87 -90.
50. Ambali, A.G., Y.A Geidam and Y.B musa, 2004. The role of columba livia and Numida meleagris galeata pallas in the Borno state, Nigeria. In: proceeding of the 41st congress of the NVMA, pp. 82-83.
51. Ambali,A.G. Abubakar,M.B. and James,T.E.(2003). An Assessment of Poultry Health Problems in Maiduguri, Borno State, Nigeria. *Tropical Veterinarian*. 21: 138-145.
52. Ambali,A.G., Abubakar, M.B, Hassan, S.U. and Adene, D.F.(2000-2001). Prevalence of Active and Passive Immunity Against Newcastle Disease in Rural Chickens under Semi-Arid Condition. *J. Life and Envir. Sci.* 2/3: 87-90.
53. Ambali,A.G., Arastus,W., Zaria,L.T. and Usman,H.S.(2000). Intestinal Tract and Tracheal Parasites of Marketed G/Fowls in Maiduguri, Borno State. *J. Arid Agric.* 10:131-133.
54. Ambali,A.G., El-Yuguda,A.D., Atiku,S.A. and Usman,B.A.(2004). Effects of Ascobic Acid and Honey on The Immune Response of Chickens to Vaccination with NDV-V4 Vaccine. *Agrosatellite J.* 1:2-7.
55. Ambali,A.G., Geidam,Y.A. and Musa Y.B.(2004). The Role of Columba livia and Numida meleagris galeata pallas in The Epidemiology of IBD in Borno State, Nigeria. *Vom J. Vet. Sci.* 1: 109-124.
56. Ambali,A.G., Mamman,A.S. and Abubakar,M.B. (2002). Sero-prevalence Study of Newcastle Disease in Feral and Domestic Pigeons in Semi-Arid Zone of Borno State, Nigeria. *Sokoto J. Vet. Sci.* 4: 30-32.
57. Ambali,A.G., Tella,C.A., Abubakar,M.B. and Gulani,A.I.(2002). Survey for Antibody Against IBD in Pigeons (*Columba livia*) in a Semi-Arid Zone of Borno State, Nigeria. *Sahel J. Vet. Sci.* 1:54-56.
58. Awoniyi, T. A.M., I A Adebayo and V A Aletor (2004): A Study of Some Erythrocyte Indices and Bacteriological Analysis of Broiler-chickens Raised on Maggot-meal Based Diets. *Int. Jour. Poult. Sci.* 3 (6): 386-390
59. Awoniyi, T.A.M. and Adebayo, I.A. (2005): A Five Year Investigation into the Causes of Turkey Mortality During Brooding And Rearing In Southwest Nigeria. *Jour. Appld. And Trop. Agric.* 9: 34-37
60. Ayo J.O. and N.S. Minka, 2004. Effects of six hour road transportation on some physiological parameters of ostriches. proceedings of the 14th animal scientific conference of the Nigerian society for animal production, March 21st - 25th 2004, Sokoto, Nigeria, pp 58-61.
61. Ayo, J.A. O.O. Omoyele, and T. Dzenda, 2005. Effects of ascorbic acid on diurnal variations in rectal temperament of Bovan nera pullets during the harmattan season . *Nigeria Society of Animal Production*, 30:67-70
62. Ayo, J.O. and V.O. Sinkalu, 2003. Effects of Ascorbic Acid on Animal Variations in Rectal Temperature of Shaver Brown Pullets during the hot-dry season. Proceedings of 28th Animal Scientific Conference of the Nigerian Society for Animal Production, March 16th - 20th 2003, Ibadan, Nigeria, pp 45-48.
63. Ayuk, A.A., B.I. Okon, and E.A. Ayayi, 2004. Effects of *Aspergillus niger* isolates on the degradation of antinutritional factors in Enterolobium cyclocarpum during solid state fermentation. Proceedings of the 29, Annual conference of the Nigerian society for Animal Production, Vol. 29, 2004, held at Sokoto. Pp. 10-16.
64. Baba S.S, C.C. Iheanacho., J.M. Idris. And A.D. El-Yuguda (2001): Food-based Newcastle disease V4 vaccine in guinea fowls (*Numida meleagris galeata*) in Nigeria: efficacy trials using locally available feed as vaccine vehicles. *Abstract, 10th International AITVM Conference in Copenhagen, Denmark 20-23 August 2001.*
65. Baba S.S, C.C. Iheanacho., J.M. Idris. And A.D. El-Yuguda (2004): Food-based in guinea Newcastle disease V4 vaccine in g. fowls (*Numida meleagris galeata*) in Nigeria: efficacy trials using locally available feed as vaccine vehicles. *Proceedings of the 41st Congress of Nigerian Veterinary Medical Association, NVRI, Vom, Nigeria, 22nd-26th November, 2004, pp 85-86*
66. Baba, S.S , C. C. Iheanacho, J.M. Idris, and A.D. El-Yuguda, 2004. Food-based Newcastle disease V4 vaccine in guinea fowls (*Numida meleagris galeata pallas*) in Nigeria: Efficacy traits using locally available feed stuff as vaccine vehicles. In: proceedings of the 41st congress of the NVMA pp., 85-86
67. Baba, S.S. (2003): Smallholder family poultry as a tool for poverty eradication in Nigeria: an adaptation of the Bangladesh model. A paper presented at the *Annual Veterinary Week organized by Association of Veterinary Medical students (AVMS), University of Maiduguri Chapter, 20-23 October, 2003, Maiduguri, Nigeria.*

68. Baba, S.S. (2004): Health and diseases of rural poultry in Nigeria. *An invited paper delivered at the National Workshop on the potentials of rural poultry as a tool in poverty reduction and sustainable development held in Calabar, Cross River state, 25-27 August, 2004.*
69. Baba, S.S. (2005): Development of thermostable genetically engineered vaccine in arid and semi-arid zones of Nigeria. *1st International Conference on Bridging the Digital and Scientific Divides: Forging Partnerships with the Nigerian Diaspora, Nigerian National Volunteer Service (NNVS) and Federal Ministry of Science and Technology, Abuja, Nigeria. July 25-27, 2005*
70. Baba, S.S. (2006): Avian influenza and family poultry in Nigeria: potentials for rapid spread and continued presence of disease. *International Network for Family Poultry Development (INFPD) Newsletter (In Press).*
71. Baba, S.S. (2006): Avian influenza in Nigeria: present situation and assessment of prevention and control paradigms. *Faculty Seminar Series, Faculty of Veterinary Medicine, University of Maiduguri, March 03, 2006.*
72. Baba, S.S. , Bouba, S., Abubakar, M.B., Awa, D., El-Yuguda, A.D. and Andre, N. (2005): Immune response of village chickens to Newcastle disease following vaccination with a single dose of combined Newcastle disease, fowl cholera and fowl typhoid vaccine (Multivax^R). *Abstract, 42nd Annual Congress, Nigerian Veterinary Medical Association, Maiduguri, Borno State, Nigeria, November 14-18, 2005.*
73. Baba, S.S. Undiandeye, U.J. and Abubakar, M.B. (2004): Species difference in immune responses of village poultry to Newcastle disease and infectious bursal disease vaccines. *Vom Journal of Veterinary Science. 1(1): 68-77.*
74. Baba, S.S., A.D El-Yuguda, and U.M. Dokas, 2004. The effects of Newcastle disease and infectious bursal 7disease vaccines, climate and other factors on the village chicken population in North –Eastern Nigeria, In. *proceedings of the 41st congress of the NVMA, pp. 72-73.*
75. Baba, S.S., Kwabugge, Y.A. and El-Yuguda, A.D. (2002): The effects of coccidiostat prophylaxis on immune response of chickens to Newcastle disease vaccine. *International Network for Family Poultry Development (INFPD) Newsletter . 12(2), July –December 2002: 3-6.*
76. Bale, O. O. J., O.O.J., A. A. Sekoni and C. N. Kwanashie (2002): A case study of possible health hazards associated with poultry houses. *Nigerian Journal of Animal Production 29(1), 102-112.*
77. Bale, O.O.J., A.A. Sekoni, and C.N. Kwanashe, 2002. *Nigerian Journal of Animal Production, 29(1)102-112.*
78. Bale, O.O.J., B.I. Nwangu, B.Y. Abubakar, 2000. *Semen Bacteria Flora of Rhode Island Red Breeder Cocks in Zaria, Kaduna State Nigeria. Journal of Animal Production 27: 16-18*
79. Bashar, Y.A and A. Abubakar, 2001. *Performance of broiler birds fed pumpkin seed meal. Nigeria society of Animal Production, 26:283-285.*
80. Biu, A.A. and Haddabi, I.(2005). *An Investigation of Tetrameres Infection Among Local Chickens in Maiduguri. Nig. Vet. J. 26(1): 41-46.*
81. Biu, A.A., Jidda, M.S. and Yahaya, K.(2005). *Prevalence of blood parasites of domestic pigeons in Maiduguri, Nigeria. Intn. J. Biomed. And Hlth. Scie. 1(1): 21-24.*
82. Biu,A.A. and Etokwudo,J.(2003). *Cestodes of Domesticated Guinea fowls (Numida meleagris galeata) in Borno State, Nigeria. Nig. J. of Exptl. And Appl. Biol. 5(2): 173-175.*
83. Biu,A.A. and Hassan, I.(2001). *Pigeon Coccidiosis: A Prevalence study in Maiduguri. Res. J. of Sci. 7(1&2): 55-59.*
84. Biu,A.A. and Lillian, O.D.(2003). *Caecal Nematodes of Local Chickens (Gallus gallus domesticus) Slaughtered at Maiduguri Central Market. Sokoto J. of Vet. Sci. 5(1): 30-31.*
85. Biu,A.A. and Monguno, L.A.(2001). *Turkey Coccidiosis: A Prevalence Study in Maiduguri, A Semi-Arid Region of North-Eastern Nigeria. Nig. J. Exptl. Appl. Bio. 2(2): 105-108.*
86. Biu,A.A. and Nwosu,C.O. (2000). *Cryptosporidial Infection of domestic Animals and Poultry in the Semi-Arid Region of Nigeria. J. Expt. And Appl. Bio. 1(1): 47-50.*
87. Biu,A.A. and Yimir,I.D.(2001). *Prevalence of Coccidia Parasites of Domesticated Ducks in Semi-Arid Zone of North-Eastern Nigeria. Res J. of Sci. 7(1&2): 17-21.*
88. Biu,A.A., Daya,B.U.A and Gulani,A.I.(2001). *Identification of Eimeria oocyst Coccidiosis. Gombe Tech. Educ. J. 3(2): 167-174.*
89. Bot, C.J., M.K. Bello, V. Pam, and M. Titus, 2004. *The role of lizards in the transmission of gastrointestinal parasites of livestock and poultry. In: proceedings of the 41st congress of the NVMA, pp. 65-67.*
90. Chah K.F, Okofofor S. and Oboegbulem, S.I (2003) *Anti microbial resistance of non-clinical E. coli strains from Chiken in Nsukka, South Eastern Nigeria. Nigerian Journal of animal production:30: 101-106*
91. Chah K.F., Asundep, N.N and Oboegbulem, S.I (2000) *Invitro growth inhibition of salmonella typhimurium by cecal E. Coli Strains isolated from Nigerian Indegenous Chiken. Proceeding of the annual conference of the society for animal production25: 299-302*

92. Chah, K.F and Oboegbulem, S.I. 2005. Effect of Ethylene diamine tetra acetic acid (EDTA) on in vitro Antibacterial activity of Teracycline and Ampicillin against Escherichia coli strains. Nigeria society of Animal production, 30:98-101.
93. Chah, K.F, Gorge L.N, and Oboegbulem, S. I (2002) Antimicrobialresistance profile of Non clinical enterococci strains from Chiken In south eastern Nigria. Proceedings of the annual conference of the society for Animal Production. 27: 255-257
94. Chah, K.F,and N.E. Nweze, 2001. Antibiotic use in poultry production in Nsukka, South-East Nigeria. Nigerian Society of Animal Production, 26:69-72
95. Chah, K.F. and E.C. Okwor, , 2003. Recurring colisepticaemia in batches of birds in a poultry farm in Nsukka, South east Nigeria. Nigerian Veterinary Journal , 24(1): 48-52.
96. Chah, K.F. and N.E. Nwewe, 2001. Antibiotic use in poultry production in Nsukka, southeast Nigeria In proceedings of the Nigerian society for animal production, 26:69-72.
97. Chah, K.F., S.C. Okafor, and S.E. Obo-gbulem, 2001. Resistance profiles of Escherichia coli strains from clinically healthy chickens in Nsukka, south-east Nigeria. In proceedings of the NVMA 38th annual congress, pp.73-76.
98. Chah, K.F., W.O. Bessong, and S.I. Oboegbulum, 2000. Antibiotic resistance in avian colisepticaemic E. coli strains in south-east Nigeria. In proceedings of the Nigerian society for animal production, 25: 303-306.
99. Chan, F.A., L.N. George and S.I. Oboegbulem, 2002. Antimicrobial resistance in enterococci strains isolated from chickens in South eastern Nigeria. Proceedings of the 27th , Annual conference of the Nigerian society for Animal Production, Vol. 29, March 17-21, 2004, held at Akure. Pp. 74-76
100. Chukwu, D.O. and S.I. Amadi, 2004. Experimental unilateral cecum in the domestic chicken. In: proceedings of the 41st congress of the NVMA, Pp. 79-80.
101. Chukwu, D.O., and B.C. Agina, 2004. Ossified muscle tendon in the wings of the domestic chicken. In: proceedings of the 41st congress of the NVMA, pp. 86-87
102. Dairo, F.A.S., 2005. Performance and haematological values of laying hens fed fermented copra meal. Nigeria Society of Animal Production, 30: 190-192.
103. Dipeola, M.A., A.J. Adebayo, and O.M. Oke, 2004. Residues of streptomycin antibiotic in commercial layers in Abeokuta and Ibadan metropolis. Nigerian Journal of Animal Prod. 2004, 31(1): 130-134.
104. Dipeolu, M.A., D. Eruvbetine and K.S. Sowunmi, 2002. Tetracycline residue deposition in eggs of layers fed antibiotics and enzyme supplemented feed. Proceedings of the 27th , Annual conference of the Nigerian society for Animal Production, Vol. 29, March 17-21, 2004, held at Akure. Pp. 292-294.
105. Ducatez, M.F. C.M. Olinger, A.A.Owoade, S. De Landtsheer, W.Ammerlaan, H.G.M. Niesters, A.D.M.E. Osterhaus, R.A.M. Fouchier and C.P. Muller (2006). Multiple introductions of H5N1 in Nigeria. Nature 442 (6), 37.
106. Durotoye, L.A., M.O. Fadaoro, and A.K. Avwmorue, 2000. Diurnal variation in blood parmeters in the chicken in the hot tropical climate. African journal of biomedical research, 3(3): 143-147.
107. EL.yugude A.D., J. Yunus, and S.S. Baba, 2001. Haemagglutination Properties of New caste Virus Strains and incubation Temperatures. Nigeria Veterinary Journal, 22 (2) 27-30.
108. El-Yuguda, A.D. and S. S. Baba(2002). Prevalence of selected viral infections in various age groups of village chickens in Borno State, Nigeria. Nigerian Journal of Animal Production 29(2), 245-250.
109. El-Yuguda, A.D., Atteh, J.O., Musa, A.B. and Baba, S.S. (2002): Evaluation of influenza virus haemagglutination under different temperature conditions using avian and mammalian species erythrocytes. Sahel Journal of Veterinary Sciences. 1(1): 28-31.
110. El-Yuguda, A.D., Baba, S.S., Abubakar, M.B. and Yerima, A.A. (2005): Seroprevalence of active and passive immunity against egg drop syndrome (EDS-76) in village poultry in Nigeria. *Abstract,42nd Annual Congress, Nigerian Veterinary Medical Association, Maiduguri, Borno State, Nigeria, November 14-18, 2005.*
111. El-Yuguda, A.D., Dokas, U.M. and Baba, S.S. (2005): The effects of Newcastle disease and infectious bursal disease vaccines, climate and other factors on the village chicken population in northeastern Nigeria. Journal of Food, Agriculture & Environment. 3(1): 55-57.
112. El-Yuguda, A.D., Wasiu, A.O., Atteh, J.O. and Baba, S.S. (2003): Haemagglutinating studies on Egg Drop Syndrome 1976 virus at different temperatures using avian and mammalian erythrocytes. Sokoto Journal of Veterinary Sciences. 5(2): 13-15.
113. El-Yuguda, A.D., Yunus, J. and Baba, S.S. (2001): Haemagglutination properties of Newcastle disease virus strains using erythrocytes from different avian species and incubation temperatures. Nigerian Veterinary Journal. 22(2): 27-30.
114. Emikpe B.O., O.G. OHore, D.O. Oluwayelu O.A. Oladale, M.A.Ockiya and S.O. Eniola 2003. Sero-precalence of antibodies to infections bronchitis Virus in Nigeria indigenou chickens in Ibadan. Nigeria Veterinary Journal, 24(3) 9-12.

115. Emikpe, B.O., Akpavie, S.O. and Adene, D.F. (2001). Influence of parenteral route on oral route of local IBD vaccine administration on the response of broiler chicks. *Revue d'élevage et de médecine vétérinaire des pays tropicaux*. 54 (3-4), 213-216.
116. Emikpe, B.O., Akpavie, S.O. and Adene, D.F. (2003). Immune response of broiler chicks to local IBD vaccine using different routes of administration. *African Journal of Clinical and Experimental Microbiology*.
117. Emikpe, B.O., Ohore, O.G., Oluwayelu, D.O., Oladele, O.A., Ockiya, M.A. and Eniola, S.O. (2003). Sero-prevalence of antibodies to Infectious bronchitis virus in Nigerian indigenous chickens in Ibadan. *Nigerian Veterinary Journal*. Vol 24(3), 9-12.
118. Emikpe, B.O., Oluwayelu, D.O., Ohore, O.G., Oladele, O.A. and Oladokun, A.T. (2005). Serological evidence of chicken anaemia virus infection in Nigerian indigenous chickens. *Onderstepoort Journal of Veterinary Research*. Vol. 72, 101-103.
119. Ezeibe M.C.O. and Agwu, U.K (2002) Seroconversion activities of oil emulsion and water based Newcastle disease vaccines. Proceedings of the 27th conference of Nigeria society of Animal Production. pp 70-71
120. Ezeibe, M.C.O and E.C. Nwokike 2005. Haemagglutination detection of Newcastle disease virus in faeces of healthy free-range chickens in Nsukka, Enugu state. Nigeria society of Animal production, 30: 87-87.
121. Ezeibe, M.C.O. (2001). Haemagglutination Technique for detection of Newcastle disease virus in live chicken. *Nig. Vet. J.* 22 (1): 3-7.
122. Ezeibe, M.C.O. and Ndip, E.T. (2005). Red blood cell elution time of strains of Newcastle disease virus. *J. Vet. Sci.* 6(4): 28-288.
123. Ezeibe, M.C.O. and Ozoemena, U.B (2000) Evaluation of virus titre and seroconversion ability of foreign Newcastle disease vaccines (Lasota) in Nigeria. Proceedings of Nigeria society for Animal production pp 296 – 298.
124. Ezeibe.M.C.O., 2001. Haemagglutination Technique for Detection of New castle Diseases Virus in Live chickens Nigeria Veterinary Journal, 22 (1)3-7.
125. Fagbohun, O.A., Oluwayelu, D.O., Owoade, A.A. and Olayemi, F.O. (2000). Survey for antibodies to Newcastle disease virus in cattle egrets, pigeons and Nigerian laughing doves. *African Journal of Biomedical Research* 3 (3): 193-194.
126. Fagbohun, O.A., Owoade, A.A., Oluwayelu, D.O. and Olayemi, F.O. (2000). Serological survey of infectious bursal disease virus antibodies in cattle egrets, pigeons and Nigerian laughing doves. *African Journal of Biomedical Research* 3 (3): 191-192.
127. Fagbohun, O.A., Taiwo, V.O., Odaibo, G.N., Oluwayelu, D.O., Aiki-Raji, C.O. and Olaleye, O.D. (2003). Total serum complement in chickens experimentally infected with infectious bursal disease virus with or without previous vaccination. *Nigerian Veterinary Journal* 24 (3), 4-9.
128. Fakae, B.B. and C.U. Paul-Abiade, 2003. Rainy Season period prevalence of helminthes in the domestic fowl (*Gallus gallus*) in Nsukka, Eastern Nigeria. *Nigerian Veterinary Journal*, 24 (1): 21-27.
129. Faluyi, O.B. and Adebayo, I. A. (2004): Comparative Studies on the Available Newcastle Disease Vaccines in Nigeria. *Top Vet.* 22 (3&4): 102-105.
130. Fasina, F.O., S.E. Idachaba, and E.P. Aba-Adulubgba, 2004. The influence of age on the development of IBD virus antibodies in chickens vaccinated with one dose of IBD vaccines. In: proceedings of the 41st congress of the NVMA, pp. 61-64.
131. Fasina, O.E., A. D. Ologhobo, G. A. Adeniran, G. O. Ayoade, O. A. Adeyemi, G. Olayode and O. O. Olubanjo (2004). Toxicological assessment of *Vernonia amygdaliana* leaf meal in nutrition of starter broiler chicks. *Nigerian Journal of Animal Production* 31(1), 3-11.
132. Fatihu, M.Y., 2002. Packed Cell Volume and total Plasma Protein in Broiler Chickens Experimentally Infected with *Ascarid galli*. Proceedings of the 39th Annual Congress on NVM, Pp.190-194.
133. Geidam, Y.A. and Ambali, A.G. (2004). Susceptibility of Rural and Exotic Chickens to IBD virus Under Arid-Zone Conditions. *Nig. J. Exptl. And Appl. Biol.* 5: 243-248.
134. Geidam, Y.A., Ibrahim, U.I., El-Yuguda, A.D. and Gambo, H.I. (2005). Outbreaks of Newcastle Disease in a Vaccinated Flock of Pullets in Maiduguri, Nigeria. *J. Arid Agric.* (In Press).
135. George, B. D. J., I. K. Ndams, and P. A. Abdu, 2004. Concurrent outbreaks of suspected duck virus enteritis in domesticated muscovy ducks *Cairina moschata* (Anatidae: Anseriformes) in and around Zaria and a prospect of control using ethnoveterinary methods. *Nigerian Journal of Scientific Research*, 4(2):1-6.
136. George, B. D. J., L. Sa'idu, and P. A. Abdu, 2004. A review and case reports of parasitic arthropods infesting local poultry and their roles in the transmission of haemoparasites in Nigeria. *Tropical Veterinarian*, 22(2):61-71.
137. George, B.D. J., S. Usman, D.Gimba, 2003. Incidence of mites in faeces of humans, domestic animals and birds and possible health implications. *Journal of Tropical Bioscience*, 3:113-116
138. Haruna, E.S., D.F. Adene, V.J. Gerrit, 2003., Detection of infection bursal disease virus (IBDV) in naturally bursal chickens in Nigeria by the Reverse transcription polymerase chain reaction (RT-PCR). *Nigerian*

- Veterinary Journal, 24(2): 1-9.
139. Ibrahim, N. D. G., P. A. Abdu, C. O. Njoku, and J. O. Adekeye, 2003. Fowl typhoid in three commercial poultry farms in Zaria, Nigeria: Case reports. *Nigerian Veterinary Journal*, 24(2):63- 67.
 140. Ibrahim, U.I., Ambali,A.G., Geidam,Y.A. and Gulani,A.I.(2003). Outbreak of IBD in a Vaccinated Flock of Chickens in Maiduguri, Nigeria. *Sahel J. Vet. Sci.* 2:35-37.
 141. Ibrahim,U.I., and Tanya,S.N.(2001). Prevalence o Antibodies to Infectious Bursal Disease (IBD) in Village Chickens in Sahel Zone of Nigeria. *Bull. Anim. Hlth. And Prdt. In Africa.* 49: 150-152.
 142. Ibrahim,U.I., El-Yuguda,A.D. and Tambari,P.S.(2000). Trial of Feed-Based Newcastle Disease ‘Lasota’ Vaccine in Chickens Using Feeds as Vaccine Vehicles. *Nig. J. Exptl. And Applied Bio.* 1(2):6-9.
 143. Ibrahim,U.I., El-Yuguda,A.D.and Tanya,S.N.(2001). Antibodies to Infectious Bursal Disease Virus (IBDV) in Village Chickens in Semi-Arid Zone of Nigeria. *Sokoto J. Vet. Sci.* 3(2): 40-43.
 144. Igboeli, G. and N.P. Uberu, 2005. Forced moulting and performance of the NAPRI commercial Layer strains. *Nigeria society of Animal production*, 30:140-142.
 145. Ihekwumera, F.C. and U. Herbert 2003. Physiological responses of broiler chickens to quantitative water restrictions: Haematology and Serum Biochemistry. *International Journal of Poultry Science*, 2(2): 117-119.
 146. Jibike,C.I., Onyeyili,P.A., Ambali, A.G., Egwu,G.O., Nwosu,C.O., Bagla,P.V. and Mohammed,A. (2002). Treatment of Experimental Coccidiosis of Broiler Chickens with X-Difluoro Methyl Ornithine (DFMO). *Sahel J. Vet. Sci.* 1: 22-27.
 147. Jibike,G.I., El-Yuguda,A.D. and Samdi,S.M.(2005). The Effects of Antistress Medications and Route of Administration on the Immunogenicity of Two Commercial Gumboro Disease Vaccine. *Sokoto J. Vet. Sci.*
 148. Jwander, L. D., U. Musa, P.D. Karsin, E.S. Haruna, J.O. Esilonu, and D. O. Agyowu, 2004. Incidence of prolapse in laying chickens and the economic implications and management in Jos south local government plateau state. In: proceedings of the 41st congress of the NVMA, pp. 44-46.
 149. Kaankuka, F.G., , P.C. Njokuand, I.D.I. Yaakugh, 2001. Performance of broilers Fed graded levels of ascorbic acid (Vitamin C). *Nigeria Society of Animal Production*, 26:262-264.
 150. Kwaga, J. K. P., L. B. Tekdek,, , L. OdamaE. P. A Abdu, L. Sa’idu, and M. A. Raji, 2003. Characterization of *Escherichia coli* isolated from poultry in Zaria, Nigeria. *Bulletin of Animal Health and Production in Africa*, 52:91-97.
 151. Lawal, A.I., O.O. Igbozurike, A.J. Natala, 2001. A comprehensive Study of Parasitism in the free range, deep litter and battery cage chickens in Zaria. *Journal of Tropical Biosciences*,1(1):89-92.
 152. Mamza, S.A., Abubakar,M.B., El-Yuguda,A.D. and Ambali,A.G.(2001). Prevalence of Active and Passive Immunity Against IBD in Village Chickens in Semi-Arid of Nigeria. *Nig. J. Exptl. And Applied Biol.*2: 87-90.
 153. Manchang, T. K., P. A. Abdu, and L. Sa’idu, 2004. The epidemiology and clinicopathologic manifestations of Newcastle disease in Nigerian local chickens. *Revue d’ elevage et de Medecine Veterinaire des Pays Tropicaux*, 57(1-2):35-39.
 154. Mani, A.U. and Bukar, U.A.(2003). Effects of High Ambient Temperature and Ascorbic Acid Supplementation on Susceptibility of Japanese Quail (*Coturnix coturnix japonica*) to Infection with Velogenic Strain of Newcastle Disease Virus. *Proceeding of the 39th Annual Conference of Animal Science Association*, held in Sokoto, October 2002 pp78-83.
 155. Matur, B.M. and Na’omi James- Rugu 2001. The prevalence of lice and fleas of chicken in Bokkos Local Government Area of Plateau State, Nigeria. *Global Journal of Pure and Applied Sciences*, 7(3): 433-435.
 156. Matur, B.M., 2002. Prevalence of some gastrointestinal parasites in pullets of chicken (*Gallus gallus domestica*) in the Federal Capital Territory, Abuja. *Journal of Tropical Biosciences*, 2(1): 78-82.
 157. Minka, N.S., A. Fayomi, J.O. Ayo 2004. Effects of road transportation and ascorbic acid on haematological parameters of pullets during the hot-dry season. *proceedings of the 38th scientific conference of the agricultural society of Nigeria*, Lafia, Nassarawa State, pp 653-659.
 158. Muhamamed, K., L. Sa’idu and A. Sekoni, 2001. Colibacillosis in a flock of intensively managed turkeyus in Shika-A case Report. *Sokoto Journal of Veterinary Science.* 3(2): 50-51.
 159. Musa, U., Nwankpa, N.D. Okewole, D.A. Chukwu, O.C. Suleiman, A.B. Ahmed, A. and dogo, G.I. 2004. Subclinical coccidiosis in poultry farms: a survey of Kano state. In: proceedings of the 41st congress of the NVMA, pp. 53-55.
 160. Natala, A.J., B.D.J. Goerge and R.I.S. Agbede, 2003. Seasonal Patterns of Ectoparasites in Poultry Zaria. A Retrospective Study. *The Nigerian Journal of Parasitology* 24: 155-160
 161. Nongo, N.N. and J.A. Bosha, 2004. Poultry vaccine handling and administration in makurdi; a preliminary investigation. In: proceedings of the 41st congress of the NVMA, pp.40.
 162. Nssien, M. A. S. and Adene, D. F., (2000). Thermostability of HA-activity of reconstituted ND vaccine virus strain at fridge and shelf storage temperatures. *Trop. Vet.* 18:140-146.

163. Nwagu, B.I., K.L., Ayorinde, A.N. Okaeme, B.Y. Abubakar, O.O. Oni, I.A. Adeyinka, C.B.I. Alawa, 2001. Incidence of Disease and Mortality Trends in Indigenous Guinea Fowls (*Numida meleagris Galeata Pallas*) reared under intensive management Systems in Nigeria. *Nigeria Veterinary Journal* 22(1) 8-16.
164. Nwanta, J. A., J. U. Umoh, P. A. Abdu, and I. Ajogi, 2003. Field trials of Malaysian thermo stable Newcastle disease vaccine (NDV4HR) in village chickens in Kaduna State, Nigeria. *XIII Congress of the World Veterinary Poultry Association*. July 19-23, 2003, Denver, Colorado U.S.A Pp. 56-57.
165. Nwanta, J.A., 2003. Field Vaccination Trials with Newcastle Disease Vaccine (NDV4HR) in Local Chickens in Kaduna State, Nigeria. PhD. Dissertation, Faculty of Veterinary Medicine, ABU, Zaria.
166. Nwanta, J.A., J.U. Umoh, P.A. Abdu, I. Ajogi and J.K. Ali-Balogun, 2006. Management of losses and Newcastle disease in rural poultry in Kaduna state, Nigeria. *Nigerian Journal of Animal Production Research*, 33(2): 276-285.
167. Nwanta, J.A., J.U. Umoh, P.A. Abdu, I. Ajogi and S.C. Egege, 2005. Comparison of the cost of unvaccinated and oral vaccinated local chickens with a Malaysian thermostable Newcastle disease vaccine (NDV4HR) in Kaduna state, Nigeria. *Bulletin of Animal Health Production in Africa*, 53: 202-210.
168. Nwanta, J.A., Umoh, J.U.; Abdu, P.A.; Ajogi, I. and Egege, S.C. (2005). Comparison of the unvaccinated and vaccinated local chicken with a Malaysian thermostable Newcastle disease vaccine (NDV₄HR) in Kaduna State. *Bull. Anim. Hlth. Prod. Afr.* 53:203 – 210
169. Nwanta, J.A.; Umoh, J.U.; Abdu, P.A. and Ajogi, I (2006). Field trials with a Malaysian thermostable NDV₄HR vaccine in village chickens in Kaduna State, Nigeria. *Journal of Livestock Research for Rural Development*. <http://www.utafoundation.org/irrd1804/nwan18062.htm>.
170. Nwanta, J.A.; Umoh, J.U.; Abdu, P.A. and Ajogi, I. (2006). Experimental trials with a Malaysian thermostable NDV₄HR Vaccine and Nigerian NDV-Lasota Vac210.cine in commercial chickens via eye-drop, drinking water and feed. *Bull. Anim. Hlth. Prod. Afr.* (accepted for publication and in press).
171. Obasi, O.L., O.J. Ifut, and E.B. Ekpo, 2001. The response of the naturally infected broiler to some brands of anticoccidials. *Nigerian Society of Animal Production*, 26:53- 54.
172. Offiong, S.A. O.O. Ojeniyi, and O.L. Obasi, 2001. Effects of skip-a-day feeding program on the growth and haematological parameters of broiler chickens. *Nigeria Society of Animal Production*, 26: 206-209
173. Ofukwe, R.A. and A.E.J Okoh, 2004. *Campylobacter fetus* sub-species *Jejuni* in faeces of ducks and geese around wells and ponds in Makurdi, Benue state in proceedings of the 41st congress of the NVMA, pp.15-16.
174. Ogbe A.O, C.A.O. Adeyefa, and R.A. Joshua, 2003. Growth rate and haematological parameters of broiler chickens vaccinated with IBD (Gumboro) vaccines exposed to different handling temperature. *Journal of science and technology Research*, 2(4) 36-38.
175. Ogbe, A.O., C.A.O. Adeyefa, R.A. Joshua, and A.A .Owoade, 2003. Studies on the effect of different handling temperatures on the immunogenicity of infectious bursal disease vaccine. A paper presented at the 40th Annual congress of the NVMA, 15th October 2003; Book of Abstract Pp.21-22. (In Press).
176. Ogbe, A.O., C.A.O. Adeyefa, R.A. Joshua, and A.A. Owoade, 2003. Effects of Different handling Temperatures on the immunogenicity of infectious Bursal Diseases Vaccines. *Nigeria Veterinary Journal*, 24(3) 13-18.
177. Ogunleye, A.O., Ajuwape, A.T.P., Adetosoye, A.I., Alaka, O.O. and Emikpe, B.O.(2005). Outbreaks of *Salmonella paratyphi A* in commercial poultry farm in Ibadan. *Tropical Veterinarian* 23(2), 65-68.
178. Ohore, O.G., Ozegbe, P.C. Emikpe, B.O, and Oluwayelu, D.O. (2002). The prevalence of antibodies to Fowl typhoid in indigenous Nigerian chickens (*Gallus gallus domesticus*). *Bulletin of Animal Health and Production in Africa* 50, 63-65.
179. Ohore, O.G., Ozegbe, P.C., Emikpe, B.O. and Okojie, V.E. (2003). Survey of antibodies to Newcastle disease virus in apparently healthy adult indigenous chickens (*Gallus gallus domesticus*) in Ibadan using ELISA. *African Journal of Clinical and Experimental Microbiology* 3(1), 38-40.
180. Ojo O. O. and Adebayo I. A. ((1998): Sero-epidemiological survey of Egg Drop Syndrome 1976 (EDS' 76) virus antibodies in local chickens. *Jour of Appld Trop. Agric.* 3 (2): 125-128.
181. Okaeme, A.N. and S.M. kawe, 2001. The management and control of coccidiosis (*eimeria* species) in guinea fowl (*numidia meleagria galeata*) under intensive rearing. In proceedings of the NUMA 38th Annual congress, pp. 92-94.
182. Oke, D.B., M.O. Oke, O.E. Fasina, and E.O. Ogunsola 2005. Response of broilers chicks to graded levels of saw dust I: performance characteristics. *Nigeria Society of Animal Production*, 30:193-194
183. Okoli, I .C, Chah K.F Herbert, U, Ozoh P.T.E and Udedibia A.B.I (2005), Anti microbial resistance on non-clinical *E. Coli* Isolates from a commercial layer poultry farm in Imo state Nigeria. *International journal of natural and Applied sciences* 1: 68-77
184. Okonkwo, A.L. L.J. Isaac, A.J. Ebreso and O.O. Usoro, 2001. Effects of roasted *L. Leucocephala* Leaf Meal on the performance of broilers. *Nigeria Society of Animal Production*, 26:217-218.
185. Okoye J. O. A (2005) The Changing Faces of Infectious Bursal Disease and the problems of its control.

- Proceedings of workshop on improved disease diagnosis, health, nutrition, and risk management practices in poultry efficiency held at Ahmadu Bello University, Zaria. Pp 22-34
186. Okoye J.O.A and Ezema,W.S (2004) Infectious Bursal Disease: A Major disease Problem of the Nigerian poultry. *Vom Journal of Veterinary Science*. 1: 56-62
 187. Okoye, J. O .A, agu A. O., Chineme, C. N and Echeonwu, G. O (2002). Pathological characterization in chickens of a velogenic Newcastle disease virus isolated from guinea fowl. *Revue D' Elevage et de Medicine Veterinaire des Pays Tropcaux* 53: 325-330
 188. Okoye, J. O. A., Clfe, M, Ikejiaku, C. N., Akowundu, V. C., Adelabu, D. B., Okwor, R. C., Orajaka, L. J. E. and Echeonwu, G. O. N. (2001). Effect of Post Infection Vaccination on Mortality Associated with Velogenic Newcastle Disease. Proceedings of the Nigerian Veterinary Medical Association held at the Administrative Staff College of Nigeria Lagos on 9th – 13th October 2001. 69 – 71.
 189. Okoye, J. O. A., Okwor, E. C., Orajaka, L. J. E,Ezema,W.S., Okosi, L. I., Chinwuba, A. R. S., Adeyey, O. V. and Amadi, C. H. (2001). Effects of Dietary Ascorbic Acid Supplementation on Mortality Associated with Infectious Bursal Disease Under Nigerian Tropical Environment. Proceedings of II International Symposium on Infectious Bursal Disease and Chicken Infectious Anaemia, Rauschholzhausen Germany. 16th – 20th June 2001. 483 – 488.
 190. Okoye, J.A.O., 2005. The changing faces of Infectious Bursal Disease (IBD) and the problems in its surveillance and control. In: Book of Proceedings. Workshop on improved disease diagnosis, health, nutrition and risk management practices in Poultry Production Efficiency (WIDRP). Ahmadu Bello University, Zaria, Nigeria, PP. 22-34.
 191. Okoye, J.O. and M. Uzoukwu, 2001. Histopathogenesis of a local Nigeria isolate of infectious bursal disease virus in broilers. in: proceedings of the 2nd international symposium on infectious bursal disease and chicken infectious anaemia . Rauschhoulzhausen, Germany, pp.366-383.
 192. Okoye, J.O.A. , E.C. Okwor, L.J.E. Orajaka, W.S. Ezema, L.I. Okoji, A.R.S. Chinwuba, O.V. Adejeje, and C.H. Amadi, 2001. Effect of dietary disease under the Nigerian Tropical Enviroment . In: Proceedings of the 2nd International Ascorbic Acid Supplementation on mortality Associated with infectious bursal Symposium on Infectious Bursal Disease and Chicken Infectious Anaemia. Rainschulzhausen, Germany, pp. 483- 488.
 193. Okpara, J.O., M.K. Bello, U. Musa, and L.O. Mgbojiekwe, 2004. The anticoccidial efficacy of five medicinal herbs extracts against eimeria tenella infection in chickens. In: proceedings of the 41st congress of the NVMA, PP. 55-56.
 194. Okpe, G. C., 2001. Comparative study of the post embryonic development of the thymus and bursa of Fabricius of Nigerian local and exotic breeds of chickens. Book of abstract of the NVMA, pp.20
 195. Okwor, E.C and Chah, K. F. (2005). Recurring outbreaks of Fowl Pox in a poultry farm in Nsukka, Southeast Nigeria. Proceedings of the annual Conference of the Society for Animal Production, 30: 117-119
 196. Okwor: E.C. J.O.A Okoye and G.O. Echeonwu, 2005. Rapid detection of Newcastle disease Virus (NDV) in tissue Extract of infected chickens by haemagglutination (HA) method. Nigeria society of Animal production, 30: 102-104.
 197. Oladale, O.A, B.O. Emikkpe, O.O. Oluwayelu, and O.G. Oloro, 2004. Comparison of Agal Gel Precipitation Text (AGPI) and Enzyme Linked immunosorbent Assay (ELISA) in the Deteetion of infectious Bursal Diseases Virus (IBDV) Antibody in village chickens in OYO State, Nigeria. *Nigerian Veterinary Journal* 25 (1), 26-29.
 198. Oladele, O. A. (2000). Epidemiology and economic importance of mycoplasma infections with special emphasis on productivity in poultry. Commissioned paper presented at a workshop organized by *AGVET Animal Health*, Ilorin, Nigeria.
 199. Oladele, O. A. (2001). Comparison of seroprevalence rate of infectious bursal disease antibody in village chickens and ducks in Southwest Nigeria. *African Journal of Clinical and Experimental Microbiology*. Vol. 2 (2), 49-51.
 200. Oladele, O. A. and Adene, D. F. (2002). A study on the value of antimycoplasmal programmes under conditions of mycoplasmosis endemicity in laying chickens. *Nigerian Veterinary Journal*. Vol. 23(1), 16-21.
 201. Oladele, O.A. (2005). Chicken egg quality: Factors and determinants (The role of diseases). A commissioned paper presented at a seminar organized by Justice Development and Peace Commission (JDPC), Ijebu-Ode, Ogun State. 11th August, 2005.
 202. Oladele, O.A. (2004). Poultry health management and production. A commissioned paper presented at the Continuing Education Session of the 2nd Annual National Conference of the Christian Veterinarians Nigeria. 1st October, 2004. Ibadan, Nigeria.
 203. Oladele, O.A. (2005). Hatchery-related bacterial diseases: The scourge of salmonellos in the Nigerian poultry industry. A commissioned paper presented at the annual conference of the Nigerian Veterinary Medical Association (NVMA), Ogun State Chapter. Abeokuta. 2nd August, 2005.
 204. Oladele, O.A. (2005). Salmonellos and drug resistance in the Nigerian poultry industry. A commissioned

- paper presented at a Seminar organized by BIMSVET NIGERIA LIMITED. 17th May, 2005. Lagos, Nigeria.
205. Oladele, O.A., Adene, D.F., Obi, T.U., Nottidge, H.O. and Aiyedun, A.I. (2005). A sequential haematological study of experimental infectious bursal disease virus infection in chickens, turkeys and ducks. *Revue d'élevage et de médecine vétérinaire des pays tropicaux*. (Accepted for publication, May, 2006).
 206. Oladele, O.A., Emikpe, B.O., Oluwayelu, O.D. and Ohore, O.G. (2004). Comparison of Agar gel precipitation test (AGPT) and enzyme linked immunosorbent assay (ELISA) in the detection of infectious bursal disease virus (IBDV) antibody in village chickens in Oyo State, Nigeria. *Nigerian Veterinary Journal*. Vol. 25(1), 26-29.
 207. Oladele, S. B., P. A. Abdu, K. A. N. Esievo, A. J. Nok, and N. M. Useh, 2003. Prevalence of Newcastle disease virus antibodies in chicks reared in Zaria. *Proceedings of the 28th Annual Conference of NSAP*, 28:5-6.
 208. Oladele, S. B., A. J. Nok, K. A. N. Esievo, P.A. Abdu, and N. M. Useh, 2005. Haemagglutination inhibition antibodies, rectal temperature and total protein of chickens infected with a local Nigerian isolate of velogenic Newcastle disease virus. *Veterinary Research Communications*, 29:171-179.
 209. Oladele, S.B. 2000. Haematological Parameters of some Apparently Healthy and some Clinical Sick Poultry Species in Zaria. M.Sc. Thesis, ABU Zaria, Pp. 116 and Conference Seminar paper Presented.
 210. Oladele, S.B. P.A. Abdu, Nok, K.A. Esievo, and N.M. Useh, 2002. Preliminary report on neuraminidase erythrocyte A.J. surface and free sialic acid concentrations in the serum of healthy and Newcastle disease virus-infected-chickens. *Revue d'élevage ET de Médecine Vétérinaire des Pays Tropicaux*, 55(4):265-268.
 211. Oladele, S.B., J.O. Ayo, K.A.N. Esievo, and S.O. Ogundipe, 2000. Effect of Season and Sex on Packed Cell Volume, Haemoglobin and total Protein of Indigenous Chickens in Zaria, Nigeria, *Journal of Medical and Allied Sciences*, 173-177.
 212. Oladele, S.B., J.O. Ayo, K.A.N. Esievo, and S.O. Ogundipe, 2003. Seasons and Species Variations in erythrocytes, osmotic fragility of indigenous poultry species in Zaria, Northern Guinea Savanna zone of Nigeria. *Bulletin of Animal Health and Production in Africa*, 51:204-214.
 213. Oladele, S.B., P.A. Abdu, A.J. Nok, K.A. Esievo, and N.M. Useh, 2002. Effects of some inhibitors on neuraminidase of Newcastle disease virus Kudu 113 strain. *Veterinarski Arhiv*, 27(4):185- 202.
 214. Olatoye, I.O., and G.A.T. Ogundipe, 2001. A survey of the usage of drugs and biologicals in poultry farms in Ibadan: the food safety concern. In the proceedings of the NVMA 38th annual congress, pp. 187-188.
 215. Oladele, S.B., J.O. Ayo, K.A.N. Esievo and S.O. Ogundipe, 2001. Seasonal and Sex Variations in Packed Cell Volume, haemoglobin and total protein of indigenous ducks in Zaria, Nigeria. *Journal of Tropical Biosciences*, 1:84-88.
 216. Olorede, B.R. and O.A. Akinloye, 2002, Haematology and Serum Chemistry of broiler chickens fed a high shea butter cake diet supplemented with fish meal or groundnut cake. In: proceedings of the 39th Annual Congress of the Nigerian Veterinary Medical Association (PCNVMA), pp. 66-69.
 217. Oluwayelu, O. I. A. and M. K. C. Sridhar (2004). Effects of domestic effluent utilization on the blood characteristics of grower pullets. *Nigerian Journal of Animal Production* 31(2), 200-206.
 218. Oluwayelu, D.O., Emikpe, B.O., Fagbohun, O.A. and Ohore, O.G. (2005). Prevalence of antibodies to three avian viral diseases in guinea fowls in Ibadan, Nigeria. *Bulletin of Tropical Animal Health and production in Africa* 53 (4), 274-276.
 219. Oluwayelu, D.O., Emikpe, B.O., Ikheloa, J.O., Fagbohun, O.A. and Adeniran, G.A. (2002). Pathology of infectious bursal disease in cross-breeds of Harco cocks and indigenous Nigerian hens. *African Journal of Clinical and Experimental Microbiology* 3 (2), 91-94.
 220. Oluwayelu, D.O., Fagbohun, O.A., Odemuyiwa, S.O., Owoade, A.A. and Olaleye D.O. (2001). Viability and immunogenicity of four commercial infectious bursal disease vaccines. *Tropical Veterinarian* 19 (1): 16-22.
 221. Oluwayelu, D.O., Todd, D., Ball, N.W., Scott, A.N.J., Oladele, O.A., Emikpe, B.O., Fagbohun, O.A., Owoade, A.A. and Olaleye, O.D. (2005). Isolation and preliminary characterization of chicken anaemia virus from chickens in Nigeria. *Avian Diseases*, Vol. 49(3), 446-450.
 222. Oniye, S.J., P.A. Audu, D.A. Adesote, D.K.O. Oshiamw, O.J. Ayansi, 2001. A Preliminary Survey of Helminths of *Fameolinus bicalcaratus* (Bush Fowl) in Zaria, Nigeria. *African Journal of Sciences*, 3: 88-89.
 223. Onu, J.E. and N. Ndu, 2003. Comparative Morphometric study of the Testes of Domestic Fowl (*Gallus Domesticus*), Domestic Duck (*Anas platyrhynchos*) and Domestic goose (*Anser Anser*). *Nigeria Veterinary Journal* 24 (3) 1-8.
 224. Opara, C.I and T.N. Kamalu, 2005. Selenium supplementation of poultry feed reduces morbidity and mortality of chickens infected with infectious bursal disease. *Nigeria Society of Animal Production*, 30: 60-62.
 225. Orajaka, L. J. E. and Ezema, W. S. (2004). The effect of Newcastle Disease Vaccine (Komorov) on Unvaccinated Local birds. *Nigerian Veterinary Journal*. 25(2): 60 – 65.

226. Orajaka, L. J. E., Okoye, J. O. A. and Oboegbulem, S. I. (2002) Seroepidemiological Survey of Mycoplasma Infections in Native and Exotic Chickens in Nsukka District of South-East Nigeria. *Journal of Sustainable Agriculture and the Environment*. 4 (1). 77 – 82.
227. Orajaka, L.J.E.; Okoye, J.O.A. and Oboegbulem, S.I. (2002). Seroepidemiologic Survey of Mycoplasma Infections in Native and Exotic Chicken in Nsukka District of Nigeria. *Journal of Sust. Agric. and Environment* 4(1): 77 – 82.
228. Osho, I.B., and E.O. Agoi, (2004) Haemoparasitic infection of muscovy duck (*Cairina moschata*) in south western Nigeria. In: proceedings of the 41st congress of the NVMA, pp 80.
229. Osho, LB. I A Adebayo and A T Oyekunle (2002): Mycological Examination for Poultry Feeds Used in Ondo State. Proc. of 27th Ann. Conf. Nig. Conf. Nig. Soc. for Anim. Prod. (NSAP), March 17-21, 2002. Fed. Univ. of Tech., Akure. Nigeria 60-62.
230. Owoade, A.A., J.A. Adeniyi. and M.O. Olatunji, 2002. Serologic evidence of influenza A virus serotypes (H1N1 and H5N1) in chicken in Nigeria. *Tropical veterinarian*, 20(3): 159-161.
231. Owoade, A.A., Oluwayelu, D.O. Fagbohun, O.A., Ammerlan, W., Mulders, M.N and Muller, C.P. (2004). Serologic evidence of chicken infectious anaemia in commercial chicken flocks in Southwest Nigeria. *Avian Diseases* 48, 202-205.
232. Oyedeji, J.O., J. O. Atteh and O. O. Ogbonini (2003). Effects of dietary ammonium sulphate (AS) on the performance and abdominal fat of broilers. *Nigerian Journal of Animal Production* 30(1), 9-14.
233. Oyekunle, M.A and M.O. Owonikoro, 2002. Antimicrobial drug usage for poultry production within a local government area in Ogun state. *Nigeria Journal Animal production* 29(1): 113-120.
234. Oyekunle, M.A. and M.O Owonikoko, 2002. *Nigerian Journal of Animal Production*, 29(1)113-120.
235. Rabo, J.S., Biu, A.A. and Casimia, N.K.M. (2002). Experimental *Eimeria necatrix* Infection: Comparative Efficacy of Sulphonamides, Amprolium and Seprin in Cockerels. *Biosci. Res. Publication*. 14(2): 151-155.
236. Sa'idu, L., A.M. Wakawa and P.A. Abdu, 2003. Snake Bite in a Multi-specie Backyard Poultry in Zaria: Case Report. *Sokoto Journal of Veterinary Sciences* Volume 5, Pp. 19-21.
237. Sa'idu, L., I. Hamman, and P. A. Abdu, 2001. Cloacal prolapse in a six-week-old ostrich chick. *Bulletin of Animal Health and Production in Africa*, 49: 203-205.
238. Sa'idu, L., L. B. Tekdek, and P. A. Abdu, 2003. Prevalence of Newcastle disease antibodies in domestic and semi-domestic birds in Zaria, Nigeria. *Veterinarski Arhiv*, 74(4):309-317.
239. Sa'idu, L., L.B. Tekdek, and P.A. Abdu. 2005. Response of Local Chickens to Lasota and V4 ND Vaccines. Presented at the 43rd Congress of the NVMA, 12-15th November 2005.
240. Sa'idu, L., P.A. Abdu, L.B. Tekdek, 2006. Newcastle disease antibodies in parent stock. *Yolk and chicks. Journal of Animal and Veterinary Advances*, 5(6): 503-506.
241. Shehu, M.M., J.U. Umoh, P.A. Abdu and L. Sa'idu, 2000. Possible role of wild birds in the Transmission of infectious Bursa Disease and Newcastle Disease. 37th Annual National Congress of the Nigerian Veterinary Medical Association. Uyo.
242. Sonfada, M.L., M.N. Sivachelvan, p. Aletander, H.D Kwari, and I Wiam, 2004. Post embryonic studies on bursa of Fabricius of domestic pigeon (*Columba livia*). In proceeding of the 41st congress of the NVMA, pp. 99.
243. Suleiman, M.H., J.O. Hambolu, S.A. Ojo, A. Gaji, P.A. Abdu and N.D.G. Ibrahim, 2003. Histopathological Response of Bursa of Fabricius post Levamisole Treatment. *Israel Journal of Veterinary Medicine*.
244. Suleiman, M.H., A.S. Yila, P.A. Abdu, B.I. Onyeanusi, J.O. Hambolu, S.A. Ojo, 2004. Case Report: Congenital Abnormalities Involving the Right Oviduct, Ovaries and Caecum of a 12 month old Layer. *Korean Society of Veterinary Science Journal*.
245. Tekdek, L.B. 2005. Metabolic and nutritional diseases: Impact on Poultry Production Efficiency In: Book of Proceedings WIRP. Ahmadu Bello University, Zaria, Nigeria, pp. 80-116.
246. Ubosi, C.O. and Bakura, S.A. (2001). The Effects of Doses of Sheep Erythrocytes on Humoral Immune Responses of Laying Chickens in a Hot Environment. In: Proceedings of 6th Annual Conference of Animal Science Association of Nigeria (ASAN) held from 17th to 19th September 2001 at the University of Maiduguri.
247. Uko, O.J. and T.N Kamalu. 2005. Haematological parameters and weight changes of cockerels fed Raw or Autoclaved Neem seed Kernels in Diets *Nigeria Veterinary Journal*, 26(1).
248. Usman, M., 2002. Effects of vaccination of Chickens Against Newcastle Disease with Thermostable V4 and Lasota Vaccine using different Grains and their Brands as vehicles. M.Sc. Dissertation, Faculty of Veterinary Medicine, ABU, Zaria.
249. Uza, D.V., S.A.S. Olurunju and J.M.T. Orkpeh., 2001. An Assessment of the Disease and Production Status of Indigenous Poultry in Benue and Nasarawa State of Nigeria. *Proceeding of the 26th Annual Conference of the Nigerian Society for Animal Production* Volume 26.

250. Wekhe S. N. (2002). The effect of *Alchornea cordifolia* on the gonads, liver, spleen, pancreas and bursa of fabricus of broilers. Proc.27th Ann. Conf., Nig. Soc. For Anim. Prod (NSAP), March 17-21, 2002, Nig. 86-87
251. Wekhe S. N. and Nyeche V.N. (2002) performance of broilers on furazolidone additive. Nig. J. Anim Prod. 29(I) 16-20.
252. Wekhe S.N and Ajayi F.O. (2001) The performance of broiler chicks treated on graded levels of metronidazole (Flagyl) Proc. Of 6th Ann. Conf. Anim. Sci. of Nig. (ASAN), Sept. 2001, Maiduguri, Nig. 87-88.
253. Wekhe, S. N. (2000). Responses of broilers to administration of graded levels of *Mansonia altissima*. Delta Agric 7, 15-21
254. Wekhe, S. N. and Wosu, G.W. (2004). The effect of consumption of crude oil by chickens on some serum enzymes. Proc. 29th Ann. Conf. Nig. Soc. Anim. Prod. (NSAP) 29, 115-119.
255. Wekhe, S.A and V. N. Nyeche (2002). Performance of broiler on furazolidone additive. Nigerian Journal of Animal Production 29(1), 16-20.
256. William,A., Sandabe,U.K., Gambo,M.U. and Bokko,B.P.(2000). Studies on The Haematological Parameters of the Domestic Pigeons (*Columbia livia*) in the Sahel Region of Nigeria. Nig. J. Expt. Bio. 1(2): 101-102.
257. Williams,A. Dunoma, A.K., and Bokko,B.P.(2002). Analysis of Common Poultry Diseases in Maiduguri. J. Life & Environmental Sci. 4(1): 166-168.
258. Yila, A.S., B.M. Jahun, M. H. Suleiman, L Sa'idu, and P.A. Abdu, 2000. Case report: partial surgical phallectomy in muscovy drake. *Israel Journal of Veterinary Medicine*, 55(4): 145.

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259. Abdu, P. A., A. M. Wakawa, and L. Sa'idu, 2005. Avian influenza: A review. *Nigerian Veterinary Journal*, 26(1):34-43.
260. Abubakar, M.B., Baba, S.S., and El-Yuguda, A.D. (2005): Seroprevalence of influenza virus types A and B infections in domestic animals in northeastern Nigeria. *Abstract, 42nd Annual Congress, Nigerian Veterinary Medical Association, Maiduguri, Borno State, Nigeria, November 14-18, 2005.*
261. Adene, D. F. (2006) Synopsis of the Management of and Responses to Avian Influenza Outbreak in Nigeria . ILRI Rapid Appraisal Studies & Workshop, Nairobi, June, 14, 2006.
262. Adene, D. F. (2006). Avian Influenza: The Trans-continental Plague. (WPSAS-Ghana , Poultry Seminar) Accra, 11 -14 April, 2006.
263. Adene, D. F.(2006). The Management and Control of Bird Flu in Nigeria – An Example of International Cooperation, Sixth Annual Congress of the Fulbright Alumni Association, Nigeria. Kano, Nigeria. 14 -17 Feb, 2006.
264. Adene, D. F.(2006). The Management and Control of Bird Flu in Nigeria – An Example of International Cooperation, Sixth Annual Congress of the Fulbright Alumni Association, Nigeria. Kano, Nigeria. 14 -17 Feb, 2006.
265. Adene, D.F. (2006). A panoramic View of Avian Influenza in Nigeria. Awareness Forum – Senate Committee, Ahmadu Bello University, Zaria, Nigeria.. 14 March, 2006
266. Adene, D.F. (2006). A panoramic View of Avian Influenza in Nigeria. Awareness Forum – Senate Committee, Ahmadu Bello University, Zaria, Nigeria. 14 March, 2006
267. Adene, D.F. (2006). Developments on Bird Flu situation in Nigeria : Back-Tracing and Projecting. WPSA (Nigeria) Poultry Fair, Lagos, Nigeria. 20 -22 Feb, 2006.
268. Adene, D.F. 2005. Synopsis of the satellite colloquium on Avian Flu. In: Book of proceedings WIRP. Ahmadu Bello University, Zaria, Nigeria, pp.147-156.
269. Adene, D.F.(2006). Developments on Bird Flu situation in Nigeria : Back-Tracing and Projecting. WPSA (Nigeria) Poultry Fair, Lagos, Nigeria. 20 -22 Feb, 2006.
270. Adene, D.F., A.M.Wakawa,P.A.Abdu, L.H. Lombin, H.M.Kazzem, L.Sa'idu, M.Y.Fatihu, T.Joannis, C.A.O. Adeyefa and T.U.Obi (2006). Clinical, Pathological and Husbandry Features associated with the maiden Diagnosis of Avian Influenza in Nigeria. (*Nig Vet jour. In Press*).
271. Adene, D.F., E.C.OKOLOCHA, AND A.Z. Hazzan (2005). Resolutions on the Avian Influenza Satellite Colloquium; Ahmadu Bello University, Zaria. Nigeria. 5 pgs.
272. Baba, S.S. (2006): Avian influenza in Nigeria: present situation and assessment of prevention and control paradigms. *Faculty Seminar Series, Faculty of Veterinary Medicine, University of Maiduguri, March 03, 2006.*
273. Faluyi, O B., Osho, LB., Adebayo, I A. and Awoniyi, TAM (2006): Avian Flu in Nigeria: A Review. Proc. of the 2nd Ann. Conf of the School of Agriculture and Agricultural Technology, Federal University of Technology, Akure. Theme: Agricultural Resources for Development in Nigeria. Held at FUTA. May 24, 2006. 110-112.
274. Oladele, O.A. (2006). Avian influenza (Bird flu). History and Clinical Presentation. A seminar paper presented at the Institute of Genetic Chemistry and Laboratory Medicine. Bodija, Ibadan. Nigeria. April, 2006.

ECONOMICS & STATISTICS

275. Akpodiet, O.J. and O. E. Inoni: Economics of production of broiler chickens fed maggot meal as replacement for fish meal. *Nigerian Journal of Animal Production* 27(1) 2000:59-63.
276. Alabi, R.A., and T.E. Mafimisebi *et al* (2000). "Risk Management in Poultry Enterprises in Edo State Through Insurance Scheme". In proceeding of the 5th Annual Conference of Animal Science Association of Nigeria (ASAN), held at Port-Harcourt, September 19-22.
277. Alabi, R.A., and T.E. Mafimisebi *et al* (2000). A feed Inventory control model for Growing Pullets". Processing of the 23rd Annual Conference of Nigerian Society of Animal Production held at Umudike. Mark 19-23.
278. Alimi, T., and D.O. Odogun, 2001. Income and employment generation ability of national directorate of employment (NDE) Poultry farming participation in Ogun state. *Nigerian Journal of Animal Production*,8(1)89-97.
279. Amos, T.T. and A.A. Ameh, 2001. Determinants of consumer attitude to processed poultry meat and products. *Nigeria Society of Animal Production*, 26:231-234.
280. Chikwendu, D.O. I.I. Dafwang, E.I. Annatte, Iwuanyanw, I.E.J. and A.O.K. Adeshinwa, 2001. Factors Alleviating the Adoption of Non-Conventional Feedstuffs by Poultry and Pig Farmers in Nigeria. In: *Strategies for Poverty Alleviation: Animal Production Option*. Proceedings of the 26th Annual Conference on the Nigerian Society for Animal Production, Zaria, pp.228 230
281. Chikwendu, D.O., J.O. Adegbehin, A.M. Omotayo, J.O. Arokoyo, J.G. Akpoko, M. Umaru and I.I. Dafwang, 2001a. Effectiveness of the Training and Visit Extension System in Nigeria. *Nigerian Journal Agricultural Extension*. 13(1) 1-14.
282. Christopher O. CHUKWUJI, Odjuvwuederhie E. INONI, O'raye D. OGISI, William J. OYAIDE (2006): A Quantitative Determination of Allocative Efficiency in Broiler Production in Delta State, Nigeria. *Agriculturae Conspectus Scientificus*, Vol. 71 (2006) No. 1 (21-26)
283. Dafwang, I.I. A.I. Annatte, E.I. Ikani, D.O. Chikwendu, I.E.J. Iwuanyanwu and A.O.K. Adeshinwa. 2001. Sources of Information and Use of Non-Conventional Feedstuff by Poultry and Pig Farmers, In: *Strategies for Poverty Alleviation: Animal Production Option*. Proceeding of the 26th Annual Conference of the Nigerian Society for Animal Production, Zaria, pp. 224-227.
284. Dafwang, I.I., 2002. Opportunities in the Agro-allied Industry in Plateau State: The Case of the Food Processing Industry. Paper Presented at the Workshop on Rural Sector Agro Industrial Development in Plateau State. State Planning Commission, Jos, October, 2002 .
285. Hassan, W.A., I. Mohammed and A.O. Dare. 2006. Traditional poultry processing as an economic activity in Sokoto - A diagnostic survey. In: Muhammad, I.R., Muhammad, B.F., Bibi-Farouk, F. and Y. Shehu (eds.) *Application of Appropriate Technology in Overcoming Environmental Barriers in Animal Agriculture in Nigeria*. Proceedings of the 31st Annual Conference, Nigerian Society for Animal Production, Bayero University, Kano, 12th - 15th March 2006, p. 217 - 220.
286. Ikani, E.I., Aduku, A. O. and Okoh, P. N. (2000). Assessment of processed rock phosphate as source of inorganic phosphorus and substitute for bone meal in broiler diets. *Nigerian Journal of Animal Production* 27(1),45-49.
287. Mafimisebi, T.E (2002). Yield of Investment in Large-scale production and Distribution of Eggs in Ibadan Metropolis". *Tropical Animal Production Investigations*, Vol. 5 (2): 91-101.
288. Mafimisebi, T.E; Okumadewa, F.Y. and A.D Wright (2002). "Marketing Margins of Differentials at Three levels of the Egg Distributive chain in Ibadan Metropolis". *Tropical Journal of Animal Science*, Vol. 5 (1): 53-64.
289. Mbanasor, J.A., 2002. Resources use pattern among poultry enterprises in Abia state. *Nigerian Journal of Animal Production*, 29(1)64-70.
290. Nwanta, J.A., J.U. Umoh, P.A Abdu, and I. Agoji, 2003. Financial implications of oral vaccination of local chickens with a Malaysian thermostable Newcastle disease vaccine (ND V4HR) in Kaduna State, Nigeria. *Nigerian Journal of Animal Production Research* (Accepted).
291. Nwanta, J.A., J.U. Umoh, P.A. Abdu, I. Ajogi and S.C. Egege, 2004. Comparative cost Implications of Unvaccinated and Oral Vaccinated Local Chickens with a Malaysian Thermostable ND Vaccine (NDV4HR) in Kaduna State, Nigeria. *Journal of Animal Production and Research*.
292. Ojewole, G.S. and Longe, O.G. (2000). Evaluation of the productive and economic efficiencies of cowpea hull and maize offal inclusion in layers ration. *Nigerian Journal of Animal Production* 27(1), 35-39.
293. Okumadewa, F.Y; Mafemisebi, T.E. and Akinade, K.E (2002). Risks Mitigation in the poultry sub-sector in Oyo State. A case study of the Nigerian Agricultural Insurance Scheme". *Tropical Journal of Animal Sciences*, Vol. 5 (32):53-63.
294. Oni O.A, Oladele, O.I and Oyewole, I. K (2005): Analysis of Factors Influencing Loan Default among Poultry Farmers in Ogun State Nigeria. *Journal of Central European Agriculture* Volume 6 (2005) No. 4

(619-624).

295. R. M. Sani, R.M., I. Tahir and S. Kushwaha (2000): Economics of poultry production in Bauchi State: A case study of Bauchi Local Government Area. *Nigerian Journal of Animal Production* 27(1) 2000:109-113.
296. T.T. Amos (2006): Analysis of Backyard Poultry Production in Ondo State, Nigeria. *International Journal of Poultry Science* 5 (3): 247-250, 2006.
297. Tewe, O.O., Fawole, O.P., Abu, A.O., Oladele, O.A., Abdullah, A.R. and Oluwole-Banjo, A.K. (2004). Report of field survey on major constraints impeding poultry production and feedmill operations in southwest Nigeria: Farmer's perspective and suggested biotechnological interventions. International Livestock Research Institute (ILRI). Ibadan.

FEEDS & NUTRITION

298. Abeke, F.O., Ogundipe, S.B., Oladele, A.A., Sekoni, I.I. Dafwang, I.A. Adeyinka, O.O. Oni and B.I. Nwagu 2003. Effects of cooking duration on the utilization of *Lablab Purpureus* beans on organ weights and blood parameters of pullet chicks. In: Proceedings of the 28th Annual Conference of the Nigerian society for Animal Production (NSAP) held at IAR&T Obafemi Awolowo University, Ibadon, March, 2003.
299. Abeke, F.O., S.O. Ogundipe, A.A. Sekoni, I.A. Adeyinka, B.Y. Abubakar, O.O. Oni, and B.I. Nwagu, 2003. Response of Laying Hens to Dietary levels of Heat Treated sheep Manure (HSM). Tropical Journal of animal Science, 6(2) 111-116.
300. Abeke, F.O., S.O. Ogundipe, A.A. Sekoni, L.L. Dafwang, O.S. Bawa, I.A. Adeyinka, O.O. Oni, B.I. Nwagu, 2004. Response of Growing Pullets to Dietary levels of Lablab Purpureas Beans. Proceeding of the 29th annual Conference of the Nigerian Society for animal Production (NSAP) held at Usman Danfodio University Sokoto (Eds-HM Tukur, WA Hassan, SA Maigandi, JK Ipinjolu, A.I. Daneji, KM Baba and BK Olerede) Pp. 241-243.
301. Abonyi, F.O. and C.N. Uchendu. 2005. Effects of graded levels palm kernel cake finisher diet on broiler performance. Nigeria Society of Animal Production, 30: 204-206.
302. Abu, O.A., Adamu,S.B., Baker,J., Igwebuike,J.U. and Onifade,A.A.(2000). Preliminary Studies on Broiler Finishers Fed High Fibre Soyabean-Based Diets Supplemented with A mixture of Commercial Enzyme of Fungal Origin. Proceedings of The 5th Annual Conference of The Animal Science Association of Nigeria. Sept. 19th -22nd, 2000 pp25-28.
303. Abu,O.A., Bakare,J., Igwebuike,J.U., Onifade,A.A. and Adamu,S.B.(2001). Preliminary Studies on Broiler Finishers Fed High Fibre Soyabean-Based Diets Supplemented with A Mixture of Commercial Enzyme of Fungal Origin: Proceeding of the 5th Annual Conference of the Animal Science Association of Nigeria Held in Port Harcourt, Nigeria, in Sept. 19th to 20th 2000 pp25-28.
304. Abubakar, A., Sekoni, A.A., Tukur, H.M. and W.A. Hassan. 2004. Impact of yeast supplementation on the growth performance of pullet chicks fed diets with high levels of rice bran. In: Tukur, H.M., Hassan, W.A., Maigandi, S.A., Ipinjolu, J.K., Daneji, A.I., Baba, K.M. and B.R. Olorede (eds.) *Sustaining Livestock Production under changing Economic Fortunes*. Proc. Nig. Soc. Anim. Prod., 29: 265 - 267.
305. Abubakar, A., Tukur, H.M., Sekoni, A.A. and W.A. Hassan. (2006). Performance and egg quality characteristics of laying birds fed diet containing two levels of rice bran with and without yeast. Savannah journal of Agriculture (In press)
306. Abubakar, A., Tukur, H.M., Sekoni, A.A. and W.A. Hassan. 2005. Influence of yeast supplementation on growth performance and carcass characteristics of broiler chickens fed diets containing two different levels of rice bran. In: Fanimu, A.O., Peters, S.O., Idowu, O.M.O., Ola, S.I. and E.B. Sonaiya (Eds.). *The Emerging Opportunities for Poultry Production in West Africa*. Proceedings of the 1st Nigeria International Poultry Summit (NIPS), The Temperance, Ota, Ogun State, Nigeria, February 20 - 25, 2005, p. 214 - 219.
307. Adamu, S.B. and Ubosi,C.O. (2001). Effects of Qualitative Feed Restriction on Productive Performance and Some Blood Components of Harco Pullets in A Semi-Arid Environment of Nigeria. Annals of Borno. 17/18: 211-216.
308. Adamu,S.B. and Bulus,Y. (2004).Optimum Levels of Dietary Fibre Tolerance for Broiler Finishers in A Semi-Arid Environment of Nigeria. Nig. J. Res. And Prdt. 2: (In Press).
309. Adamu,S.B., Mubi,A.A. and Gulumba,M.H. (2001). Effects of Avizyme 1500 Supplementation on Nutrient Digestibility and Egg Quality Factors of Laying Chckens in A Semi-Arid Environment of Nigeria. Sabondale J. Technical Education. 4:75-81.
310. Adamu,S.B., Vanda,U. and Igwebuike,J.U.(2001). Effects of Graded Levels of Millet on The Performance of Anak Giant Broilers Under the Semi-Arid Condition of North-Eastern Nigeria. Proceedings of the 6th Annual Conference of Anima Science Association of Nigeria, 17th -19th Sept. 2001. pp2-4.
311. Adamu,S.B., Waziri,Y.D. and Abbator,F.I.(2001). The Use of Different Energy Sources on The Performance of Broiler Chickens Under A Semi-Arid Environment. Proceedings of the 6th Annual Conference of the Association of Animal Science of Nigeria. 17th -19th Sep. 2001, pp5-8.
312. Adamu,S.B., Yaya, N. and Alade, N.K. (2001). Comparative study of Effects of Four Energy Sources on Finishing and Carcass Characteristics of Admiral Broiler Chickens Under Semi-Arid Condition. J. Sustainable Agri. And Envir. 3(2): 232-238.
313. Adegbola, T.A., 2004. Utilizing proven alternative feed ingredients in the livestock industry. Proceedings of the 29th , Annual conference of the Nigerian society for Animal Production, Vol. 29, 2004, held at Sokoto. Pp. 431-436.
314. Adejinmi, O.O., J.O. Adejinmi and I.O.A. Adeleye (2000). Performance characteristics and nutrient digestibility of broilers fed varying levels of soldier fly larvae meal. *Trop. J. Anim. Sci.* 3(2):99-106
315. Adejumo, D.O. (2005). Haematology, growth and performance of broiler finishers fed rations supplemented with Indian almond (*Terminalia catappa*) husk and kernel meal. Ibadan Journal of Agricultural Research

- 1(1): 1-6
316. Ademola, S.G. and Farinu, G.O. (2006). Performance of laying birds fed diets containing forage meal of *Tithonia diversifolia* (Hems A. Gray) and antibiotics. *Nigerian Journal of Animal Production*. 33(1), 58-68.
 317. Ademola, S.G. and G.O. Farinu, 2004. Growth performance and carcass characteristics of broiler fed garlic and ginger. Proceedings of the 29th , Annual conference of the Nigerian society for Animal Production, Vol. 29, 2004, held at Sokoto. Pp. 25-26
 318. Adene, D. F. (2005). Application of costs in disease evaluation to risk management in Poultry production. *Proc. Workshop on Poultry Health and Production Efficiency. Ahmadu Bello University, Zaria, Nigeria, Nov., 2005. Pg 117 -133.*
 319. Adeniji, A. A. and O. O. Balogun (2002). Utilisation of flavour treated blood – rumen content mixture in the diets of laying hens. *Nigerian Journal of Animal Production* 29(1),34-39.
 320. Adeniji, A.A. and O. O. Balogun (2001). Evaluation of blood-rumen content mixture in the diets of starter chicks. *Nigerian Journal of Animal Production* 28(2),153-157.
 321. Adeniji, C.A. (2005). Performance and carcass characteristics of broiler chicken fed high fibre sunflower seed cake diets. *Nigerian Journal of Animal Production* 32(2), 198-203.
 322. Adeniji, C.A. and A.D. Ologhobo (2000). Utilisation of full-fat sunflower seed in the diets of broiler chicken. *Trop. J. Anim. Sci.* 3(2):165-170
 323. Adeniji, C.A. and Ogunmodede, B.K. (2006), Growth, nutrient retention and serum metabolites of broiler chickens fed high fibre hulled sunflower seed cake. *Nigerian Journal of Animal Production*. 33(2), 222-229.
 324. Adeosun, S.L., 2003. Detremination of the Nutritional value of Hatchery Waste in Poultry Die. Thesis Submitted to the Postgraduate School. Ahmadu Bello University, in Partial fulfillment of the requirement for the degree of M.Sc. Animal Siene, A.B.U. Zaria.
 325. Aderemi, F.A. (2004). Effects of replacement of wheat bran with cassava root sieviate supplemented or unsupplemented with enzyme on the haematology and serum biochemistry of pullet chicks. *Tropical Journal of Animal Science*. 7(1), 147-153.
 326. Aderolu, A.Z., E.A. Iyayi, A.A. Onilude and I.Eniola (2004). Biodegraded rice husks in laying bird's diet: 1. Performance and egg quality parameters. *Livestock Research for Rural Development* 16 (1), Art. No. 94.
 327. Adewumi, B.A., 2004. Preliminary studies on A.C/D.c. heat source cum kerosene lantern for egg incubation finishers. *Nigeria Journal of Animal production*, 31 (1) 32-39.
 328. Adeyemi, O. A. and Adeyemi, A. A. (2000). Replacement of soybean meal with fermented thevetia cake in layers diet: effects on performance, egg quality and nutrient retention. *Nigerian Journal of Animal Production* 27(1), 24-28.
 329. Adeyemi, O.A., J. O. Atteh and S. A. Ibiyemi (2001) Apparent nitrogen corrected and true metabolisable energy of processed thevetia oil for broiler finisher birds. *Nigerian Journal of Animal Production* 28(1),56-60.
 330. Aduguwa, O.O., A. O. Fanimio and A. V. Jegede (2004). Effect of enzyme supplementation on the utilization of shrimp-waste meal based diets by broiler chicken. *Nigerian Journal of Animal Production* 31(2),167-173.
 331. Afolayan G.G., Oloredo B.R., O.J. Uko: A.U. Junaidu and A.O. Fanimio (2002). The replacement value of maize bran for maize in broiler diets. Proceedings of 7th annual conf. of Animal Science association of Nigeria, 16th –19th September, 2002 Abeokuta, Ogun state Pp. 91-93
 332. Agbede, J.O Adaye, S.A and Aletor, V.A 2005. Some Muscle Growth in broiler chickens fed discarded cashew nut meal in place of soyarBeans meal. *Nigeria society of Animal production*, 30:220-223.
 333. Agbede, J.O., V.A. Aletor, 2003. Evaluation of fishmeal replaced with leaf protein concentrate from glyricidia in diet for broiler chick: effects on performance, muscle growth, hematology and serum metabo 2(4): 242-250.
 334. Agugu, G.O. and G.C. Okeke, 2005. The effect of replacing maize with cassava root meal in the diets of pullet chicks. *Nigeria society of Animal Reproduction*, 30: 235-237.
 335. Agunbiade, J.A., B. O.Tolorunji and H. A. Awojobi (2004). Shrimp waste meal supplementation of cassava product based diet fed to broiler chickens. *Nigerian Journal of Animal Production* 31(2), 182-188.
 336. Agunbiade, J.A., O.A. Adeyemi, O.A. Adepoju and O.A. Lawal (2002). The use of whole cassava meal and leaf meal in broiler diets. *Trop. J. Anim. Sci.* 5(1):161-173.
 337. Ahamed T.S. and B.R. Oloredo (2003). Effect of feeding varying levels of locust bean pulp (dorowa) on the carcass yield and economy of broiler production Proc. 8th Ann. Conf. Anim. Sci. Ass. of Nig. Sept.16th – 18th Fed. Univ. of Tech. Minna pp. 4 - 6
 338. Ahamed T.S. and B.R. Oloredo (2004). Performance characteristics and nutrient retention of broiler chicken fed locust bean pulp. Proc. of the 29th Ann. Conf. of NSAP 21st – 25th March 2004 pp. 275 – 278.
 339. Akanji, A.M., A.D. Ologhobo, G.N. Egbunike R. Mosenthin and E.A. Emiola (2003). A comparative study of the effects of heat-treated plant proteins on hatchability of fertilized eggs from exotic laying hens. *Trop. Anim. Prod. Invest.* 6(1): 1-12.

340. Akinmutimi, A.H. and O.C. Onwudike, 2001. Utilization of raw sword bean (*Cassava gladiata*) in broiler diet. Effect on Haematological parameters and blood chemistry. Nigeria Society of Animal Production, 26:240-241.
341. Akinmutimi, A.H., 2001. The effect of Potash-cooked lima beans on the organs weight and cut parts of broiler finisher birds. Nigeria society of Animal Production, 26: 238-239.
342. Akinmutimi, A.H., S.F. Abasiokong and R.O. Izundu (2002). Effect of processing on metabolizable energy and protein content of sword bean (*Canavalia gladiata*) using muscovy ducks (*Carina muschata*). *Trop. J. Anim. Sci.* 5(1):51-56
343. Akpodiete, O.J. and G.O. Okagbare (2002). Haematological and biochemical indices of meat- and egg-type chickens fed maggot meal. *Trop. J. Anim. Sci.* 5(1):175-180
344. Amaefule K.U. and F. C. Obioha (2001): Performance and nutrient utilization of broiler starters fed diets containing raw, boiled or dehulled pigeonpea seeds. Nigerian Journal of Animal Production 28(1), 31-39.
345. Amaefule, K.U. and F. C. Obioha (2001). Performance and nutrient utilisation of diets containing raw, boiled or dehulled pigeonpea seed meals (*Cajanus cajan*) fed to broiler finishers. Nigerian Journal of Animal Production 28(2),135-142.
346. Amaetule, K.U., 2001. The effects of processing on the intake and metabolisability of pigeon pea seed based diets by broilers. Nigeria society of Animal Production, 26: 235-237.
347. Amaetule, Kau and F.C. Obioha, 2001. Performance and nutrients Utilization of broilers starters fed diets containing raw, boiled or dehulled pigeon pea seeds (*cajanus cajan*). Nigerian Journal of Animal Production, 28(1) 31-39.
348. Ani, A.O. and A. U. Okorie (2005). The effects of graded levels of dehulled and cooked castor oil bean (*Ricinus communis*, L) meal on performance of broiler starters. Nigerian Journal of Animal Production 32(1) 2005:54-60.
349. Anyanwu, G.A., B.O. Esonu, F. Iwuala, K. Okorie and E.B. Etuk (2003). Bambara groundnut (*Voandzea subterranean* (L) thours) offals as partial substitute for maize in broiler diets. *Trop. Anim. Prod. Invest.* 6(1): 55-61
350. Asaniyan, E.K and E.A.O. Laseined 2005. Comparative studies of the performance of broiler chickens fed different commercial diets. 30:121-12 6.
351. Awesu, J.R., A. M. Bamgbose, O. O. Iduguwa, A. O. Fanimu and E. B. Oguntona (2002). Performance and nutrient utilization of cockerel finishers fed graded levels of rice milling waste. Nigerian Journal of Animal Production 29(2) 2002:181-188.
352. Awojobi, H.A. and O. O. Meshioye (2001). A comapraison of wet mash and dry mash feeding for broiler finisher during we season in the tropics. Nigerian Journal of Animal Production 28(2) 2001:143-146.
353. Awosanya, B. and Faseyi, O.O. (2001). The effect of cooking methods on yield and acceptability of battered spent fowls. *Nigerian Journal of Animal Production* 28 (2), 193-198.
354. Ayanwale, B.A. and O.G. Odedokun, 2001. Chemical composition of Alkali-treated rice bran in broilers diet. Nigeria Society of Animal Production, 26:246-247.
355. Ayanwale, B.A. (2006). Growth and carcass characteristics of broilers fed alkali processed soyabeans. *Nigerian Journal of Animal Production.* 33(1), 40-44.
356. Ayanwale, B.A. and Gado, Y. (2001). Effect of commercial diets on egg quality characteristics. *Nigerian Journal of Animal Production* 28(2), 202-206.
357. Ayanwale, B.A. and M.N. Kudu, 2001, Effect of alkali treatment of soyabean on broiler performance. Nigeria Society of Animal Production, 26:248-249.
358. Ayanwale, B.A., T.Z. Adama and E.Z. Jiya (2003). Meat yield and meat composition of broiler chicken fed sodium chloride treated rice bran as replacement for corn offal. *Trop. J. Anim. Sci.* 6(1): 27-32
359. Ayanwale, B.A., T.Z. Adama and M.A. Musa (2003). Effect of inclusion of cotton seed cake on the laying performance and egg quality of layers. *Trop. J. Anim. Sci.* 6(1): 33-38.
360. Ayodele O. Fasuyi, Kola S.O. Fajemilehin and Samuel O. Aro (2005): Nutritional Potentials of Siam Weed (*Chromolaena Odorata*) Leaf Meal (SWLM) on laying Hens: Biochemical and Haematological Implications. Pakistan Journal of Nutrition 4 (5):336-341, 2005.
361. Ayorinde, K.L., Y. Song, P. Durmmond and E. J. Smith (2001) Molecular genetic analysis of diversity in village chickens in Nigeria. Nigerian Journal of Animal Production 28(2), 128-134.
362. Babangida, S. and Ubosi, C.O. (2006). Effects of varying dietary protein levels on the performance of laying Japanese quail (*Coturnix coturnix japonica*) in a semi-arid environment. *Nigerian Journal of Animal Production.* 33(1), 45-52.
363. Babatunde, B.B. and R. A. Hamzat (2005). Effects of feeding graded levels of kolanut husk meal on the performance of cockerels. Nigerian Journal of Animal Production 32(1) 2005:61-66.
364. Bambose, A.M., O. Awosanya, O.T. Oluwasey and A.O. Oso, 2003. Performance of broiler fed enzyme supplemented Tiger nut (*Cyperus rotundus*) meal based diet. Ghana Journal of Agricultural Science. In Press.

365. Bambose, A.M., S.D. Ogungbero, E.E. Obasohan, M.B. Aruna, I.T. Oteku, U.F. Ogene, C.S.O. Otoikhian and J.A. Imasuen, 2004. Replacement value for maize offal and Cashew nut for maize in broiler diet. Proceedings of the 29th , Annual conference of the Nigerian society for Animal Production, Vol. 29, 2004, held at Sokoto. Pp. 219-221.
366. Bashar, Y.A. and Abubakar, A. (2001). Performance of broiler birds fed pumpkin (*Cucubita maxima*) seed meal. Proceedings of the 26th Annual conference of the Nigerian Society for Animal Production, 26, 283-285.
367. Bashar, Y.A., Abubakar, A. and Nasiru, M. (2002). Effects of replacing wheat offal with rumen digesta in the diet of cockerels. Proceedings of the 27th Annual conference of the Nigerian Society for Animal Production (NSAP), March 17-21, 2002, Federal University of Technology, Akure, Nigeria.
368. Bolu, S.A. and O. O. Balogun (2003). Effects of graded levels of iron-fortified locally produced natural vitamin premix on the performance and carcass characteristics of broilers. Nigerian Journal of Animal Production 30(2) 2003:192-196.
369. Bolu, S.A. and O.O. Balogun (2002). Effect of varying levels of iron fortified locally produced natural vitamin premixes on the histology and specific enzyme activities of broilers. *Trop. J. Anim. Sci.* 5(1):57-63
370. Brown, A.A., Ajayi, S.A. and Fala, S.A. (2000). Effect of supplementation of layers' diet with mixtures of different pepper species on egg quality. Nigerian Journal of Animal Production 27(1), 71-78.
371. Carew, S.N., O.I.A. Oluremi, and E.P. Wambutla, 2005. The Quality of commercial poultry feeds in Nigeria. Nigeria Veterinary Journal, 26(1) 47-50.
372. Dada, S.A.O., Atanda, L.A. and Alabi, B.E. (2000). Utilization of leucaena leaf meal as a protein supplement in broiler finisher rations. Nigerian Journal of Animal Production 27(1),40-44.
373. Dafwang, I.I., E.I. Ikani, D.O. Chikwendu, I.E.J. Iwuanyanwu, A.O.K. Adesehinwa and A.I. Annatte., 2001b. Adoption of Non-Conventional Feedstuffs by Poultry and Pig Farmers in Nigeria. In: Strategies for Poverty Alleviation: Animal Production Option. Proceedings of the 26th Annual Conference on the Nigerian Society for Animal Production, Zaria, pp. 254-257.
374. Dairo, F.A.S. and B.K. Ogunmodeds 2001. The performance of broilers diets in which fermented copra meal protein replaced G/nut cake protein. Nigeria Society of Animal Production, 26: 204 – 205
375. Dairo, F.A.S. and Ogunmodede, B.K. (2004). Performance of laying hens fed coconut meal as replacement for groundnut cake. *Tropical Journal of Animal Science.* 7(1), 127-132.
376. Dairo, F.A.S. and Ogunmodede, B.K. (2006). Utilization of coconut meal based diets supplemented with lysine by broiler chicken. *Nigerian Journal of Animal Production.* 33(2), 178-185.
377. Diara, S.S., Kwari, I.D., Ubosi, C.O., and Kwari, H.D. (2002). The Potentials of Millet Bran as Substitute for Wheat Bran in Broiler Chicken Diets. *J. Sustain. Agric. Environ.* 4(2): 165-169.
378. Dipeolu, M.A and R.O. Osikalu, 2002. Tetracycline residues in marketed layer birds in Lagos and Ibadan metropolis. Proceedings of the 7th Annual conference of Animal Science Association of Nigeria (ASAN) held Setp. 16-17th 2002. University of agriculture, Abeokuta, Nigeria. Pp., 55-57.
379. Dipeolu, M.A. N.J. Akpan and A. Olutayo, 2000. Residue of Tetracycline antibiotic in Turkey and eggs of chickens sold for human consumption. *Poultry, Sci. J.* 1(1)4-11.
380. Dipeolu, M.A., A.J. Adebayo, and M.O. Oke, 2004. Residues of streptomycin antibiotic in commercial Layers in Abeokuta and Ibadan metropolitic. Nigeria Journal of Animal production, 3 (1) 130-134.
381. Durunna, C.S., A. B. I. Udedibie and M. C. Uchegbu (2005). Effect of dietary inclusion of *Anthonata macrophyla* meal on the performance of broiler starter chicks. Nigerian Journal of Animal Production 32(2), 268-273.
382. Durunna, C.S., M.C. uwakwe, and M.J. Okeudo, 2005. Influence of replacing soyabean meal with varying dietary levels of *Anthonata macrophyla* seed meal on the quality of chicken egg. Nigeria Society of Animal Production, 30: 217-219.
383. Duwa, H., Ubosi, C.O. and Kwari, I.D. (2002). The Influence of Oxytetracycline and Vita Stress Supplementation on The Production Performance of Broiler Chickens in the Semi-Arid Zone of Nigeria. *J. Iss. Tech. Edu.* 1(1):1-7.
384. Edache, J.A., U. Musa, E. S. Haruna, P. D. Karsin, J. O. Esilonu and I. I. Jibrin (2005). Calcium requirement of Japanese quail (*Coturnix coturnix japonica*) chicks in Plateau State, Nigeria. Nigerian Journal of Animal Production 32(2), 246-252.
385. Egbewande O.O and B.R. Olorede and C. Onwuchekwa (2004). Performance of broiler chicks fed mistletoe (*Tapinantius bangwensis*) leaf meal Proc. of the 29th Ann. Conf. of NSAP 21st – 25th March 2004 pp. 279 – 281. Sokoto.
386. Egbewande O.O. and B.R. Olorede (2003). Substitution of ground nut cake with mistletoe (*Loranthus bengwensis*) leaf meal in broiler diets. Proc. 8th Ann. Conf. Anim. Sci. Ass. of Nig. Sept. 16th – 18th Feb. Univ. of Tech. Minna pp. 1-3
387. Emenalom, O.O. (2004). Comparative performance of broiler chicks fed diets containing differently processed *Mucuna pruriens* seed meals. Nigerian Journal of Animal Production 31(1) 2004:12-16.

388. Emenalom, O.O. and I.C. Nwachukwu 2004. Effect of calcium hydroxide soaked and cooked velvet beans (*Mucuna pruriens*) on the performance of finisher broilers (2004). *Nigeria Journal of Animal production*, 33 (1) 53-57.
389. Emenalom, O.O. and Nwachukwu, I.C. (2006). Effect of calcium hydroxide soaked and cooked velvet bean (*Mucuna pruriens*) on the performance of finisher broilers. *Nigerian Journal of Animal Production*. 33(1), 53-57.
390. Emiola, A.I., Ologhobo, A.D., Farina, G.O., Diya, T.O. and Aderolu, A.Z. (2004). Evaluation of “cracked-decorticated-cooked” mucuna seed meal in broiler starter diets. *Tropical Journal of Animal Science*. 7(1), 119-125.
391. Emiola, I.A., A.D. Ologhobo, J. Akinlade, O.S. Adedeji and O.M. Bamgbade (2003). Effect of inclusion of differentially processed *Mucuna utilis* seed meal on performance characteristics of broilers. *Trop. Anim. Prod. Invest.* 6(1): 13-21.
392. Eruvbetine, D. and Adejobi, P.K. (2000). Preparation of cass-soya concentrate for inclusion in poultry diets (in-vitro studies). *Nigerian Journal of Animal Production* 27(1), 50-54.
393. Esomu, B.O. A.B.I. Udedibie, and L.A. Agbabiaka, 2001. Comparative performance of boilers fed diets containing differently processed jackbean meals. *Nigerian Society of Animal Production*, 26: 202-203.
394. Esonu, B.O. (2001). Comparative evaluation of raw and urea/toasted velvet bean (*Mucuna pruriens*) for broiler chicks. *Nigerian Journal of Animal Production* 28(1), 40-44.
395. Esonu, B.O., F. C. Iheukwumere, T. C. Iwuji, N. Akanu and O. H. Nwugo (2003). Evaluation of *microdesmis puberula* leaf meal as feed ingredient in broiler starter diets. *Nigerian Journal of Animal Production* 30(1), 3-8.
396. Esonu, B.O., Izukanne, R., Emenalom, O.O., Etuk, E.B., Inyang, O.A., Samuel, S., Ezeoke, F. and Mere, B. (2006). Evaluation and economics of enzyme supplementation on the performance of broiler finishers fed soybean hull meal based diet. *Nigerian Journal of Animal Production*. 33(2). 216-221.
397. Etchu, K.A. and G.N. Egbunike (2003). Haematological and biochemical changes in broilers fed processed sweet potato-based diets in the humid tropics during the rainy season. *Trop. Anim. Prod. Invest.* 6(1): 45-54
398. Etuk, E.B. and A.B.I. Udedibre, 2004. Effect of cooked pigeon pea seed meal on the performance, dressed and organ weight characteristics of broilers. *Nigeria Journal of Animal production*, 33 (1) 16-22.
399. Etuk, E.B., B .O. Esonu, and E. Njoku, 2003: Effect of methionine supplementation in the performance of finisher broilers fed Pigeon Pea seed based diet In: Proceedings of the 28th Annual conf. Of the NSAP, Vol.28, 2003, held at IAR & T, OAU, Ibadan Pp., 258-260.
400. Ezekwe, A.G. and Udeozor. I.J. (2003). Effects of quantitative feed restriction on the semen quality of Nigerian local cocks. *Nigeria J. Anim. Prod.*
401. Ezieshi, E.V., A. Omoregie, and J.M. Olomu, 2001. Productive performance and some physical and internal qualities of laying chicken fed palm kernel cake based diets. *Nigerian Society of Animal Production* 26: 199 -201.
402. Faniyi, G.F. A.M. Durojaiye, A.A. Adeleye, A.L. Ogunmola, O.S. Bolaji, and A.O. Oyewole, 2005. Effects of level and period of replacing maize (zea mays) with mango seed kernel on performance and economics of producing pullets chicks and growing pullets. *Nigeria Society of Animal Production*, 30 : 213-216
403. Fasina O.E., A.D. Ologhobo, G.A. Adaremi, G.O. Ayoade, O.A. Adeyemi, G. Olayode, and O.O. Olubanjo, 2004. Toxicological assessment of vernoria amygdaliana leaf meal in nutrition of starter broiler. *Nigeria Journal of Animal production*, 31 (1) 3-11
404. Gibodi, T.A. S.E. Atawodi, and A.A. Atiku, 2001. Mineral composition of some Nigerian Limes tones used in chicken layer ration. *Nigeria Veterinary Journal*, 22(1) 70-73.
405. Hamzat, R.A Adejinmi, B.B Babatunde, and O.Olubamiwa 2005. Effect of dietary inclusion of kolapod husk on performance and carcass characteristics of cockerels. *Nigeria society of Animal production*, 30: 224-227.
406. Hamzat, R.A., C. J. Onwumere and I.O.A. Adeleye (2000). Utilization of graded levels of cowpea meal in broiler finisher ration. *Trop. J. Anim. Sci.* 3(2):63-67
407. Hassan, W.A. and A.S. Hamza. 2004. Awareness of chick sexing methods among village poultry keepers in Sokoto state, Nigeria. In: Ogunji, J.O., Osakwe, I.I., Ewa, V.U., Alaku, S.O., Otuma, M.O. and B.O. Nweze (eds.) *Self Sufficiency of Animal Protein in Nigeria: A Reality or a Mirage*. Proceedings of the ninth annual conference of the Animal Science Association of Nigeria (ASAN), Ebonyi State University, Abakaliki, 13 - 16 September, 2004, p. 274 - 276.
408. Hassan, W.A. and A.U. Adamu. 2002. Domestic pigeon diversity in the semi-arid zone of Nigeria : Initial results from characterisation studies. *Nigerian J. Basic and Appl. Sci.*, 11 (1 & 2) 209 - 218.
409. Hassan, W.A. and B. Usman. 2004. Some performance characteristics of Nigerian native domestic fowls in Sokoto South Local Government Area of Sokoto State. *Nigerian J. of Tropical Agriculture*, 7 (In press).
410. Hassan, W.A. and B.S. Malami. 2004. Preliminary evaluation of feeding habit and growth performance of indigenous domestic fowls in Sokoto, Nigeria. *Nigerian Poultry Science J.*, (2 & 3): 16 - 20.

411. Hassan, W.A. and I. Abdullahi. 2006. Variation in bodyweight and comb size of the indigenous domestic fowls in north-western Nigeria. In: Muhammad, I.R., Muhammad, B.F., Bibi-Farouk, F. and Y. Shehu (eds.) *Application of Appropriate Technology in Overcoming Environmental Barriers in Animal Agriculture in Nigeria*. Proceedings of the 31st Annual Conference, Nigerian Society for Animal Production, Bayero University, Kano, 12th - 15th March 2006, p. 18 - 21.
412. Hassan, W.A. and M. Abdulkareem. 2005. Response of growing indigenous chickens to dietary levels of calabash seed cake in the semi-arid tropics. In: Uguru, M.I., Iroegbu, C.U. and V.C. Ejere (Eds.). *Genetics and Sustainable Agriculture*. Proceedings of the 30th annual conference of the Genetics Society of Nigeria (GSN), University of Nigeria, Nsukka, October 5 - 8, 2005, p. 171 - 174.
413. Hassan, W.A. and T. Muhammad. 2005. Growth response of intensively-managed native domestic fowls (*Gallus domesticus*) to diet containing grasshopper meal in Sokoto, Nigeria. In: Fanimu, A.O., Peters, S.O., Idowu, O.M.O., Ola, S.I. and E.B. Sonaiya (Eds.). *The Emerging Opportunities for Poultry Production in West Africa*. Proceedings of the 1st Nigeria International Poultry Summit (NIPS), The Temperance, Ota, Ogun State, Nigeria, February 20 - 25, 2005, p. 211 - 213.
414. Ibiyo, L. M. O. and Atteh, J.O. (2005). Response of starter broilers to diets containing graded levels of rice bran with or without palm oil. *Nigerian Journal of Animal Production* 32(1), 39-45.
415. Idowu, O.M.O. and Daisy Eruvbetine (2005). Performance, digestibility and carcass yield of broiler chickens fed diets containing two types of fishmeal. *Nigerian Journal of Animal Production* 32(2), 204-214.
416. Idowu, O.M.O., Daisy Ruvbetine, O. O. Oduguwa, A. M. Bamgbose and S. S. Abiola (2003). Response of finishing broiler chickens fed three energy/protein combinations at fixed E:P ratio. *Nigerian Journal of Animal Production* 30(2), 185-191.
417. Idowu, O.M.O., Oduwefo, A. and Eruvbetine Daisy (2005). Performance and hypo-cholesterolemic response of laying hens fed cassava root sievate – based diets. *Nigerian Journal of Animal Production* 32(2) 2005:215-223.
418. Igwebuike, J.U., Kwari, I.D., Ubosi, C.O. and Alade, N.K. (2001). Replacement Value of Spent sorghum Grains for Maize in Broiler Finisher Diets. *J. Sustainable Environment* 3(2):224-231.
419. Igwebuike, J.U., Mubi, A.A. and Gwoza, U.Y. (2001). Comparative Performance of Replacement Pullets Fed Three Commercial Growers Diet. *Sabondale J. Tech. Edu.* 4:104-109.
420. Ikani, E.I., I.I. Dafwang, D.O. Chikwendu, A.O.K. Adeshinwa, A.I. Annatte and E.J. Iwuanyanwu., 2001. Socio-Economic Characteristic of and Sources of Feeds for Poultry and Pig Farmers in Nigeria. In: *Strategies for Poverty Alleviation: Animal Production Option*. Proceeding of the 26th Annual Conference of the Nigerian Society for Animal Production. Zaria, pp. 250-253.
421. Isidahomen, E.C., Kwari, I.D. and Igwebuike, J.U. (2005). The Performance and Nutrient Digestibility of Broiler Chickens Fed Raw and Differently Processed sorrel (*Hibiscus sabdanffa*) Seed as Replacement for Groundnut Cake. *Nig. J. Exptl. Appl. Bio.* (In Press).
422. Iyayi, E. A. and F.K. Fayoyin (2005). Effect of feeding cassava fruit coat meal on the nutrient digestibility and performance of broilers. *Livestock Research for Rural Development*, 17, Art. No. 9.
423. Iyayi, E. A., O.Ogunsola and R. Ijaya (2005). Effect of three sources of fibre and period of feeding on the performance, carcass measures, organ relative weight and meat quality in broilers. *International Journal of Poultry Science*. 4(9), 695-700.
424. Iyayi, E.A. and B.I. Davies (2005). Effect of supplementation of palm kernel meal and brewer's dried grain on the performance of broilers. *International Journal of Poultry Science*. 4(2), 76-80.
425. Iyayi, E.A. and D.O. Okhankhuele (2002). Cassava leaf meal and exogenous enzymes as supplements in broiler finisher diets. *Tropical Veterinarian*, 20(3), 172-180.
426. Iyayi, E.A. and D.O. Okhankhuele (2002). Response of broiler starter chicks to diets supplemented with cassava leaf meal. *Tropical Veterinarian*, 20(2), 68-74.
427. Iyayi, E.A. and V.O. Taiwo (2002). The effects of diets incorporating *MUCUNA* (*Mucuna pruriens*) seed meal on the performance of laying hens and broilers. *Tropical and Subtropical Agroecosystems 1* (2002).
428. Iyayi, E.A. and Z.A. Aderolu (2004). Enhancement of the feeding value of some agro-industrial by-products for laying hens after their solid state fermentation with *Trichoderma viride*. *Afri. J. Biotechnol.*, 3(3), 182-185.
429. Iyayi, E.A., H. Kluth and M. Rodehutsord (2006). Chemical composition, antinutritional constituents, prececal crude protein and amino acid digestibility I three unconventional tropical legumes in broilers. *Journal of Science of Food and Agriculture*. Accepted (July, 2006).
430. Iyayi, E.A., H. Kluth and M. Rodehutsord (2006). Prececal crude protein digestibility, organs relative weight and performance in broilers fed diets containing *Enterolobium cyclocarpum* and *Mucuna pruriens* *European Poultry Science (Archiv fur Geflugelkunde)*, Accepted (August, 2006).
431. Iyayi, E.A., V.O. Taiwo and A.O. Fagbohun (2005). Performance, carcass characteristics, haematological and histopathological studies of broilers fed *Mucuna utilis* bean meal based diets. *Israel Journal of Veterinary Medicine*, 60 (2), 51-58.

432. Jegede, A.V. O.O. Oduguwa, A.O. Fanimu, A.M. Bamgbose, and J.A. Agunbiade, 2004. Effect of processing methods on the utilization of shrimp waste by boiler chickens. *Nigeria Journal of Animal production*, 33 (1) 23-39.
433. Jegede, A.V., Oduguwa, O.O., Fanimu, A.O., Bamgbose, A.M. and Agunbiade, J.A. (2006). Effect of processing methods on the utilization of shrimp waste by broiler chickens. *Nigerian Journal of Animal Production*. 33(1), 23-39.
434. Kwari,I.D. and Igwebuiké,J.U.(2002). Performance of Broiler Chickens Fed Graded Levels of African Locust Bean (*Parkia biglobosa*) Pulp. *Nig. J. Exp. Appl. Bio.* 3(2): 233-237.
435. Kwari,I.D., Igwebuiké,J.U. and Diara,S.S.(2003). Effects of Replacing Groundnut Cake with Full-Fat Soyabean on the Performance of Finisher Broiler Chickens in the Sub-Sahelian Zone of Nigeria. Proceedings of the 8th Annual Conference of Animal Science Association of Nigeria, held in Sept. 15th to 18th 2003 in Minna Niger State, Nigeria, pp187-189.
436. Kwari,I.D., Igwebuiké,J.U. and Diara,S.S.(2004). Performance of Finishing Broiler Chickens Fed Diets Containing Different Levels of Sheabutter Cake. *J. Sustain. Trop. Agric. Res.* 10: 79-82.
437. Kwari,I.D., Igwebuiké,J.U., Bello,N., Rabo,S.T. and Birma,M.(2004). Replacement of Groundnut Cake with Surrel (*Hisbiscus sabdiriffa*) Seed Meal in Broiler Finisher Diets. Proceedings of the 9th annual Conference of Animal Science Association of Nigeria, Sept. 13th to 16th, 2004 held in Abakaliki, Nigeria, pp5-7.
438. Ladokun, A. O. and Longe, O.G. (2004). The effect of replacing groundnut cake protein diet with cocoa bean meal protein on performance of broilers. *Tropical Journal of Animal Science*. 7(1), 91-97.
439. M.A. Isika, B.I. Okon, E.A. Agiang and J.A. Oluyemi (2006): Dietary Energy and Crude Protein Requirement for Chicks of Nigeria Local Fowl and Crossbreeds. *International Journal of Poultry Science* 5 (3): 271-274, 2006.
440. Maigandi, S.A., Bashar, Y.A. and Garba, Y. (2001). Performance of broiler birds fed *Faidherbia albida* pod meal (FaPm) replacing maize at various levels. *Journal of Agricultural Extension*. Pgs.....
441. Maikano, A. 2005. Effects of Graded Levels of Rice Offal in Broiler Diets. Thesis Submitted in Partial Fulfillment of the Requirement for the Degree of M.Sc. in Animal Science. Department of Animal Science. ABU, Zaria.
442. Matanmi, O., Akinfala, E.O., Aderibigbe, A.O. and Akinsuyi, M.A. (2004). Response of cockerels fed whole cassava plant meal based diet in the humid tropics. *Tropical Journal of Animal Science*. 7(1), 83-89.
443. Mubi,A., Igwebuiké, J.U. and Okonkwo,A.C.(2001). The Effects of Supplementation with the antibiotic Oxytetracycline hydrochloride on The Performance of Replacement Pullets in the Sun-Sahelian Zone of Nigeria. *J. Tech. Edu.* 4:88-93.
444. Ndirmbita,J.L. and Ubosi,C.O. (2005). Neem Tree (*Azadirachta indica*) Kernel As A Source of Dietary Protein for Broiler Chickens in the Semi-Arid Zone of Nigeria: Effects of ammoniated Full-Fat Neem Kernel Meal. *Sahel J. Vet. Sci.*
445. Ngum, B.N., H.M. Ndofor, F.C. Obiola, 2001. The effects of substituting ripe plantain peels for maize as an energy source in broiler starter diet. *Nigerian Society of Animal Production*, 26:222-223
446. Oduguwa, O.O. A.O. Fanimu, and A.V. Jeojede, 2004. Effect of enzyme supplementation on the utilization of shrimp waste meal based diets by broiler chickens. *Nigeria Journal of Animal production*, 31 (2) 167-173.
447. Oduguwa, O.O., A. O. Fanimu and J. O. Mercy (2005) Effect of replacing dietary fish meal or soybean meal with shrimp waste meal on the performance of laying hens. *Nigerian Journal of Animal Production* 32(2) 2005:224-232.
448. Odukwe, C.A. and F.C. Obiola, 2001. Determination of the optimum trace mineral/vitamin premix level in composite cassava root meal-based diets for broilers starters. *Nigerian Society of Animal Production*, 26: 268-270.
449. Odunsi A. and A. J. Gbadamosi (2001). Effect of dietary inclusions of palm oil and sheabutter fat on growth and sexual maturity of pullets. *Nigerian Journal of Animal Production* 28(1), 26-30.
450. Odunsi, A.A., Ige, A.O., Sodeinde, F.G., Akinlade, J.A. and Afon, A.O. (2006). Growth and carcass yield of finishing broiler chickens fed lablab leaf meal. *Nigerian Journal of Animal Production*. 33(2),203-208.
451. Odunsi, A.A., Oladunjoye, I.O. and Emiola, I.O. (2005). Response of finisher broilers fed varying dietary protein levels in a tropical environment. *IJAAAR* 1(1), 63-67.
452. Ogbamgba, K. O. and Wekhe, S.N. (2006). The effect of dietary inclusion of *Mansonia altissima* on feed intake, feed efficiency, and feed conversion of laying birds and cocks. *African Journal of Biotechnology* 5, 1022-1024.
453. Ogbamgba, K. O., Wekhe, S. N. and Igoni, D.U. (20002). Effect of supplemental feed additives on the performance of broilers. *Proc. 7th Ann. Conf. Anim. Sci. Ass. Of Nig. (ASAN)*, Sept. 16-19 2002, Abeokuta, Nig. 139-142
454. Ogbe, A. D., A. Uyai, I. I. Ahmad, J. Joda, D. Elisha, L. H. Lombin, N. J. Zwander, M. T. Joannis, L. O. Mgbojkwe, D. T. Pam, E. S. Atawodi, and P. A. Abdu, 2005. A preliminary study on the use of edible mushroom (*Pleurotus ostreatus*) as source of protein supplement and probiotic in poultry production:

- Implication on human health. *The Proceedings of the first Nigerian International Poultry Summit of the Worlds Poultry Science Association (Nigerian Branch)*, Edited by Fanimu, A. O. Peters, S. O. Idowu, S. A. Ola, S. L. and Sonaiya, E. B. Otta, Feb. 20-25th, 2005. Pp. 91-94.
455. Ogbonna, J.U. and A.K. Ige (2002). Effect of varying levels of dietary cassava (*Manihot esculenta*, Crantz) leaf meal on broiler gut morphology. *Trop. J. Anim. Sci.* 5(2):13-17
 456. Ogbonna, J.U., F. I. Ogundola and A. O. Oredein (2001). Effect of wet feed on cockerel chicken performance. *Nigerian Journal of Animal Production* 28(1),52-55.
 457. Ogbonna, J.U., K.J. McCracken, J. Lilley, and A. McAllister, 2001. Effects of enzyme supplementation of cassava root meal based chick diets on intestinal viscosity. *Nigerian Society of Animal Production*, 26: 271-273.
 458. Ojewola, E. N. Nwachukwu, S. F. Abasiokong, A. H. Akinmutimi and O. A. Oluwafisayo (2004). Bioefficacy and economics of RonozymeTM P as a substitute for bone meal in turkey poult ration. *Nigerian Journal of Animal Production* 31(2), 161-166.
 459. Ojewola, G.S and O.G. Longe, 2001. Influence of varying dietary protein and energy concentrations on maintenance, tissue and feather growth rates of broilers. *Nigeria Society of Animal Production*, 26:242-245.
 460. Ojewola, G.S., E.N. Nwachuku, S.F. Abasiokong, A.H. Akinmutimi, and O.A. Olu wafiseyo, (2004). Bioefficacy and economic of RonozymeTMP as a substitute for bone mean in turkey poultry ration. *Nigeria Journal of Animal production*, 31(2) 161-166.
 461. Ojewola, G.S., K.U.Amaefule, S.F. Abasiokong, A.H. Akinmutimi, A.S.Lawal and K. Anyanwu (2002). Responses of broiler finishers to dietary methionine and or lysine supplementation. *Trop. J. Anim. Sci.* 5(1): 189-196.
 462. Ojewola, G.S., S.N. Ukachukwu and F. Onyenucheya (2000). Comparative carcass characteristics of indigenous turkey poult fed different agro-industrial by-products. *Trop. J. Anim. Sci.* 3(2):159-164
 463. Okeke, G.C. and Ani, A.O (2003). The substitution of pigeon pea (*cajanus cajan*) seed meal for soyabean in broiler finisher ration. *Proc. Annual conf. Anims. Sci. Asso. Nig.*
 464. Okendo, N.J, H.C. Ololo, F. Gloria., and C.E. Omeike, 2005. Differences in Growth rate, carcass characteristics and organoleptic quality between Anak, Hybro and hubbard Broilers strains. *Nigeria society of Animal production*, 30:155-158.
 465. Okeudo, N.J., I. Onwuchekwa, I. Chinyerem and I.C. Okoli (2003). Effect of oil treatment and length of storage on the internal quality, organoleptic attributes and microbial profile of chicken eggs. *Trop. Anim. Prod. Invest.* 6(1): 63-70.
 466. Okoli, I.C., A.A. Omede, M.N. Opara, and M.C. Uchegbu, 2004. Quality assessment of some commercial poultry feed sold in Nigeria. In: proceedings of the 41st congress of the NVMA, pp.89-90.
 467. Okoye, F.C. 2001. Replacement of cassava peal leaf meal for maize as energy source in diet of broilers finishers. *Nigerian Society of Animal Production*, 26: 271-273.
 468. Oladunjoye, I.O., Ologhobo, A.D., Emiola, I.A. and Amao, O.A. (2004). Growth performance, carcass analysis and organ weights of broilers fed varying levels of breadfruit (*Artocarpus altilis*) meal based diets. *Tropical Journal of Animal Science.* 7(1), 133-140.
 469. Olaka, O. S., Mgbere, O. O and Dambo, L. B (2000). Effect of intake of sucrose on performance of broilers in the tropics. *Delta Agric* 7, 69 - 72
 470. Olaka, S.O. and Steamer, E. M.(2000). Relationship between feed intake and energy requirement in broiler chicks in the tropics. *Proceedings of 5th Ann. Conf. Anim. Sci. Ass. Of Nig. (ASAN)*, Sept. 19-20, 2000, Port Harcourt, Nigeria 16-17
 471. Oloredo B.R. and A.F. Ajayi (2005). Replacement of groundnut cake and maize with *Falderbia Albida* (GAO) in the diets of broiler chickens *Bull. Anim. Hlth. Prod. Afr.* Vol. 53, pp 61-67.
 472. Oloredo B.R. and A.J. Igenoza (2003). Replacement Value of Egg Shell for bone meal and Oyster shell in the diet of laying hens. *J. Agric. And Environment.* Vol.4 No. 1&2.Pgs.....
 473. Oloredo B.R. and O.G. Longe (2002). Effect of replacing palm kernel cake with sheabutter cake on performance characteristics and economics of eggs production of laying hens. *J. Agric. and Environment* Vol.3 No.1 pp. 183 - 186
 474. Oloredo B.R.; Y. Saidu and Ajagbonna O.P; O.A. Akinloye (2000). Blood Chemistry and Histopathology of Cockerels fed cassava flour, *Proceedings of seventh annual conference of Animal Science association of Nigeria*, 16th – 19th September 2002 Abeokuta, Ogun State. Pgs.....
 475. Oloredo B.R.; and Longe, O.G. (2000). Growth, Nutrient retention, haematology and serum chemistry of broiler chickens fed a high sheabutter cake supplemented with molasses or palm oil. *Tropical veterinarian* Vol. 19 (2): 9-16
 476. Oloredo B.R.; Y. Saidu; I.M. Abdu and O.A. Akinloye (2002). Growth Performance and economics of Cockerels fed cassava flour based diet. *Proceeding of 7th Annual Conference of Animal Science Association of Nigeria* 16th – 19th September, 2002 Abeokuta, Ogun State. Pgs.....
 477. Oloredo, B.R. and O.A. Akinloye (2002). Haematology and serum chemistry of broilers chickens fed a high

- sheabutter cake diet supplemented with fishmeal of groundnut cake. Proceedings of the 39th NVMA Conference, Sokoto 2002, pp. 66-69.
478. Olorede, B.R.; A.R. Alade and O.P. Ajagbonna (2000). Effects of substituting groundnut cake with Acacia seed Kernel meal as a major protein source in broiler production performance. *Trop. J. of Animal Science* Vol. 3(2): 107-115
 479. Olorode, B. R. and Longe, O. G. (2000) Effect of replacing palm kernel cake with sheabutter cake on egg quality characteristics, haematology and serum chemistry of laying hens. *Nigerian Journal of Animal Production* 27(1), 19-23.
 480. Olorode, B.R., A.R. Alade and O.P. Ajagbona (2000). Effects of substituting groundnut cake with acacia seed kernel meal on performance, haematology, serum biochemical parameters and economy of production of broilers. *Trop. J. Anim. Sci.* 3(2):107-115
 481. Oloyo, R.A. (2002). Niacin requirement of broilers fed maize – palm kernel meal based diets. *Nigerian Journal of Animal Production* 29(1), 27-33.
 482. Olugbemi, T.S., A.O. Aduku, S.O. Ogundipe, I.A. Adeyinka, 2002. Evaluation of Raw Sunflower seed in Broilers Diets. *Indian Journal of Animal Science* 72: 1009-1012.
 483. Olugbemi, T.S., Y.K. Oladipo, A.O. Aduku, I.A. Adeyinka, 2002. Utilization of Roasted Sunflower by Broilers: *Science Forum Journal of Pure and Applied Science* 6: 49-55.
 484. Oluokun, J.A. (2000). Upgrading the nutritive value of full-fat soyabean meal for broiler production with either fishmeal or black soldier fly larvae meal (*Hermetia illucens*). *Trop. J. Anim. Sci.* 3(2):51-61
 485. Oluremi, O.I.A. and M.K.C Sridhar, 2004. Effects of domestic are effluent utilization on the blood characteristics of grower pullets. *Nigeria Journal of Animal production*, 31 (2) 200-206
 486. Omeke, B.C.O., P.A. Nnadi, and W.S. Ezema, 2003. Evaluation of Fisméal Protein supplementation to commercial Feeds for Egg Lay and Quality in warm Tropical Region . *Nigeria Veterinary Journal*, 24 (2) 27-33
 487. Onibi, G.E., 2001. The effect of retail conditions on consumers' preference for turkey meat. *Nigerian Society of Animal Production*, 26:95-98.
 488. Onibi, G.Z., 2005. Effect of dietary oils and vitamin E. supplementation on meat Quality of broilers chickens. *Nigerian Society of Animal Production*, 30:149-152.
 489. Onifade, A.A., Odunsi, A.A., Adebisi, Q.A., Abubakar, A., Enowebot, A.E., Muma, E. and Akinsoyonu, O.A. (2000). Comparison of the performance of starting pullets fed supplemental baker's or feed grade yeast in diets containing high levels of palm kernel meal. *Archiv fur geflugelkunde*, 64, (4), 1-5.
 490. Onimisi, P.A., I.I. Dafwang, and J.J. Omage. 2006b. Growth Performance and Water Consumption Patterns of Broiler Chicks fed Graded levels of Ginger Waste Meal. In: *Application Technology in Overcoming Environmental Barriers in Animal Agriculture in Nigeria* Proceeding of the 31st Annual Conference of the Nigerian Society for Animal Production, Muhammad, I.R. Edits. B.U. Kano., March, 2006: pp: 337-340.
 491. Onuh, S.O., 2005. Evaluation of the performance of finishing broiler fed different Agro-industrial by-products. *Nigeria Society of Animal Production*, 30: 169-171.
 492. Onyimonyi, A.E (2005). Comparative Evaluation of the performance of laying birds fed safizyme GP 800. *Proc. 30th Ann. Conf. Nig. Society of Anim. Prod.* Vol. 30; pp 228 – 229.
 493. Onyimonyi, A.E and Onukwufor, J.O (2003). Effect of Toasted Bambara (*Voandzela subterrenea* Thouars) Waste (TBW) on performance of Grower Pullets. *Proc. 28th Ann. Conf. Nigerian Society of Animal Production*, Vol. 28; pp 237-239.
 494. Onyimonyi. A.E. and Okeke, G.C. (2000). Protein and energy requirements of the Japanese quail (*cortunix japonica*) in the humid tropics. *Journal of Agriculture, Technology and Education*, 5 (1x2); 35-37.
 495. Orusebio, S. M. and Omu, P.B. (2000). The effect of lysine supplementation of commercial broiler feeds on the performance of broilers. *Proceedings of 25th Ann. Conf., Nig. Soc. For Anim. Prod. (NSAP)*, March 19-23, 2000, Umudike, Nigeria 117-120.
 496. Orusebio, S.M. and Wariboko, N. O. (2000). Evaluation of methionine in growth performance of broiler chickens under humid tropical condition. *Proceedings of 5th Ann. Conf. Anim. Sci. Ass. Of Nig. (ASAN)* Sept. 19-20, 2000, Port Harcourt, Nig. 53-56.
 497. Oruwar, B.M., A. O. Anibo and D. M. Nkanta (2004), Effect of replacing maize with cassava/brewers dried yeast blend (Cassayeast) on performance of broiler chicks and feed cost in southern Nigeria. *Nigerian Journal of Animal Production* 30(2),169-178.
 498. Oruwar, B.M., Amakiri, A.O., Ogbuji, J.A. and Johnson, N.C. (2000). Merabolisable energy values of whole palm kernel and palm kernel oil sludge using laying hens and adult broiler chickens. *Nigerian Journal of Animal Production* 27(1), 64-70.
 499. Oruwari, B. M., Amakiri, A.O. and Nwate, L.A. (2001) Tolerance of broiler chicks to high intake of sodium chloride *Nig. Vet. J.* 22(1) 24-36.
 500. Oruwari, B.M., Anibo, A.O. and Nkanta, D.M. (2003), Effect of replacing maize with cassava/brewers dried

- yeast blend (cassayeast) on performance of broiler chicks and feed cost in Southern Nigeria. Nigerian Journal of Animal Production 30(2)
501. Otokunefor, W.O. and J.M. Olomu, 2001. The Evaluation of palm kernel meal as a replacement for Maize in the Diet of laying chickens. Nigeria Veterinary Journal 22 (1)53-63.
 502. Owasobo A.O.; O.G. Longe; O. Alatise; A. Akinade and B. R. Olorede (2003). Effect of pelleting sheabutter cake based diet fed to broilers on performance and nutrient utilization. Proc. of the 28th Ann. Conf. NSAP 16th – 20th March 2003 pp. 208-210. Ibadan.
 503. Oyedeji, J.O. and J. O. Atteh (2003). Response of broilers to 3 weeks feed restriction initiated at different time periods. Nigerian Journal of Animal Production 30(2), 157-162.
 504. Oyedeji, J.O., J. O. Atteh and S. A. Adedeji (2003). Response of broiler to skip a day (SAD) feeding. Nigerian Journal of Animal Production 30(2),163-168.
 505. Peters, S.O., Ikeobi, C.O.N., Ozoje, M.O. and Adebambo, O.A. (2005): Modelling growth in seven chicken genotypes. Nigerian Journal of Animal Production 32(1), 28-38.
 506. S.O. Aro and S.O.K. Fajemilehin (2005): Effect of Varying Levels of Siam Weed (*Chromolaena Odorata*) Leaf Meal on Layers Performance and Nutrient Utilization. Proc, 1st Annual Conf. on Dev. in Agric. & Biol.Sci.,27th April, 2005, Federal University of Technology Akure, Nigeria.
 507. S.O. Ogundipe, Abeke, F.O., A.A. Sekoni, I.I. Dafwang and I.A. Adeyinka, 2003. Effects of cooking duration on the utilization of *Lablab Purepureus* beans by pullets chicks. In: Proceedings of 28th Annual conference of the Nigerian society for Animal Production (NSAP) held at IAR&T Obafemi Awolowo University, Ibadon, March, 2003.
 508. Salami, R.I. (2005). The response of cockerel finishers to different protein supplements as sole source of protein in their diet. IJAAAR 1(1), 7-12.
 509. Salami, R.I., O. G. Longe and J. A. Oluyemi (2004). Effect of dietary protein levels on the performance and carcass characteristics of cockerel finishers. Nigerian Journal of Animal Production 31(1), 27-31.
 510. Salami, R.I., O.G Longe, and J.A. Olayemi, 2004. Effects of dietary protein levels on the performance and carcass characteristics of cockerel finishing Nigeria Journal of Animal production, 31 (1)27-31.
 511. Sanni, S.A., 2003. Economics of four modules of Poultry Production in Northern Nigeria. In: A.A. Taiwo et al (eds)Nigeria Livestock. A Goldmine for Economic Growth and Food Security. Proceeding of the Nigerian Society of Animal Production 28: 436-469.
 512. Sekoni, A.A., I.A. Adeyinka and S.O. Ogundipe (2002). Effect of quantitative feed restriction on pullet development and subsequent egg production. *Trop. J. Anim. Sci.* 5(2):19-26.
 513. Shittu, A.M., G.O. Olayode, O.M. Bamiro, and F.M.Aderimi, 2004. Effects of using non-conventional feedstuff on the productively and cost of egg farms in Ibadan, Nigeria. Nigeria Journal of Animal production, 31(1) 65-78.
 514. Sogunle, O.M., Fanimu, A.O., Biobaku, W.O. and Bamgbose, A.M.(2005). The feeding value of full-fat cashew nut (*Anacardium Occidentale Lin*) rejects and low cereal diets for broiler chickens. Nigerian Journal of Animal Production 32(1), 46-53.
 515. Sonaiya, E.B. J.S. Dazogbo, and O.A. Olukosis, 2002. Further assessment of scavenging feed resource base. In: characteristics and parameters of family poultry production in Africa . FAO/IAEA Co-coordinated Research Programme. Pp 193-200.
 516. Taiwo, A. A., A.D. Adejuyigbe, A. A. Olusegun, M.B. Gbadamosi, O.J. Obe, and E.A. Adebowale, 2005. Effects of varying levels of inclusion of soyabean residue on the performance of broilers finishers birds. Nigeria Society of Animal Production, 30: 207-209
 517. Taiwo, A.A., A.M. Raji, A.D. Adejuyigbe, Ogundola, F.I. and E.A. Adebowale, 2001. Utilization of two energy diets by cockerel finishers supplemented with or without honey water. Nigerian Society of Animal Production, 26: 274- 275.
 518. Tion, M.A and M.J. Orga, 2004. The effect of calorie to protein ratios of practical diets on performance and carcass quality of broiler chickens. Proceedings of 29th Annual Conference of the Nigerian Society for AAnimal production. 2004, held at Sokoto. Pp 222-224.
 519. Tion, M.A. and P.C. Njoku, 2001. The effect of calcium sources and limestone deposits on laying hen performance and egg shell quality. Nigerian Society of Animal Production, 26: 276-278.
 520. Tion, M.A., M. T. Orga and I. A. Adeka (2005). The effect of calorie to protein ratio of practical diets on performance and carcass quality of broiler chickens. Nigerian Journal of Animal Production 32(2), 253-260.
 521. Tion, M.A., P. C. Njoku and S. O. Ogundipe (2005) Solubility and bioavailability studies of limestone sources with layers. Nigerian Journal of Animal Production 32(2), 240-245.
 522. Tukur, H.M., Abubakar, A., Bashar, Y.A. and Abdullahi, A (2000). Performance testing of Shika brown layers in Sokoto. Final report submitted to National Animal Production and Research Institute, Samaru, Zaria, Nigeria.

523. Tuleun C.D., M.C. Njike, S.A. Ikurior, and Ehiobu. 2005. Replacement of maize with cassava root meal/ brewers yeast slurry in the diet of broiler chicks. Nigeria Society of Animal Production, 30: 183-185.
524. Tuleun, C.D. and Njoku, P. C. (2000). Effect of supplemental ascorbic acid and disturbance stress on the performance of broiler chickens. Nigerian Journal of Animal Production 27(1), 55-58.
525. Tuleun, C.D., M.C. Njike, S.A. Ikuriro and N.G. Ehiobu (2005). Laying performance and egg quality of hens fed cassava root meal/brewers yeast slurry based diets. Production Agriculture and Technology 1(1):146-152.
526. Ubosi, C.O. and Sekuna,A.M.(2000). Effects of Varying Levels of Full-Fat Soyabeans and Groundnut Cake on the Performance of Broilers in a hot dry environment. In:Proceedings of 25th Annual Conference of the Nigerian Society for Animal Production held at Umudike from 19th to 23rd March 2000, pp277-281.
527. Ubosi,C.O. (2000). Effects of qualitative feed Restriction on Productive Performance and Blood Constituents of Broiler Pullets. J. Iss. Tech. Edu. 2: 28-37.
528. Ubosi,C.O. (2000). Improving the current animal production system. In: Nigeria Society for Animal Production. Book of Proceedings of 25th Annual Conference, pp4-8 held at Michael Okpara University of Agriculture, Umodike, Umuahia, Nigeria.
529. Ubosi,C.O., Otika,A.E. and Diara,S.S.(2002). Effect of Potassium Chloride and Sodium Bicarbonate Supplementation on Performance of Laying Hens in a Hot, Dry Environmant. Sahel J. Vet. Sci. 2:23-26.
530. Uchendu C.N. and F.O. Abonyi, 2005. Carcass quality of broilers fed graded levels of palm kernel cake finish diet. Nigeria Society of Animal Production, 30 : 210-212
531. Udebibie, A.B.I., B. O. Esonu and U. Okah (2002). Determination of the optimum dietary levels of cracked and cooked jackbean meal for finisher broilers. Nigerian Journal of Animal Production 29(2) 2002:176-180.
532. Udedibie, A.B.I., B. C. Anyaegbu, G. C. Onyechekwa and O. C. Egbuokporo (2004). Effect of feeding different levels of fermented and unfermented cassava tuber meals on performance of broilers. Nigerian Journal of Animal Production 31(2), 211-219.
533. Ugwuene, M.C; O.C. Onwudike, B.F. Abasiekong, and C.M. Nnadikekw. 2005. Effects of replacing maize with full-fat palm kernel meal in broiler diets. Nigeria Society of Animal Production, 30: 179-182
534. Uko, O. J. and Adamu, U. (2005). New mixing ratio of oxalate salts for the maintenance of stable PCV of Nigerian domestic fowl (*Gallus domesticus*) and guinea fowl (*Numida meleagris*). Sahel Journal of Veterinary Sciences 6 (in press)
535. Uko, O. J. and Kamalu. T. N. (2005); Growth response, haematology and organ weight of cockerels challenged with raw or autoclaved neem seed kernels in diets. Nigerian Veterinary Journal 26:10-17
536. Uko, O. J. Kamalu, T. N. Babatunde, G. M. (2005): Chemical composition and feeding value of water washed raw or heats-treated neem (*Azadirachta indica* A. Juss) seed kernels for broiler production. British Poultry Science (submitted.)
537. Uko, O. J. Tade, A. O. and Kamalu, T. N. (2005): Evaluation of chemical content and nutritional value of raw or autoclaved and water-washed neem (*Azadirachta indica* A Juss) seed kernels in diets for cockerel chicks. Archivos de Zootecnia (submitted)
538. Uko, O.J and Kamalu, T.N (2005). Protein quality and toxicity to cockerels of full-fat neem (*Azadirachta indica* A.Juss) seed kernel. Archivos de Zootecnia 55:51-62.
539. Uko, O.J., Kamalu, T.N., Pindiga, U.H., and Rabo, J.S. (2005). Studies on toxicity to cockerel chicks of raw full-fat neem (*Azadirachta indica* A.Juss) seed kernel. Veterinarski Arhiv 76: 135-144
540. Wekhe S. N. and Njoku C.O. (2000) Preliminary investigation of the effects of *Alchornea Cordifolia* on weight gain and organs size of broilers proceedings of 5th Ann. Conf. Anim. Sci. Ass. Of Nig. (ASAN) Sept. 19-20, 2000, Port Harcourt, Nig. 23-24.
541. Yiljep, Y.P. and I.I. Dafwang, 2004. Assesment of the Participatory Agricultural Extension Approaches in Hadejia Valley Irrigation Project. Journal of Agricultural Engineering and Technology 12 (1): 142-155.

FOOD SECURITY

542. Adesope, O. M. and Nodu, M.B. (2002). A note on acceptance of duck as table-meat among inhabitants of selected communities in the Niger Delta zone, Nigeria. *Livestock Research for Rural Development* 14 (16)
543. Adeyinka, I.A., B.Y. Abubakar, O.O. Oni, A.A. Sekoni, B.I. Nwagu, F.O. Abeke, 2001. Effects of egg size on Chick Hatch Weight and Subsequent body Weights of two Strains of Rhode Island Chicks under Selection. *Tropical Journal of Animal Science*, 4(2): 7-12.
544. Ayanwale, A.B. and J.O. Ajetomobi, (short communication) 2001. The role of house-hold composition in egg consumption in the Obafemi Awolowo University. *Nigerian Journal of Animal Production*, 28(1)98-102.
545. Bolorunduro, P.I., S.O. Aribido, G.S. Bawa, T.T. Amos, and O.C. Jegede, 2001. Food society and poverty alleviation: Application of livestock-cum-fish culture Models in transforming rural agriculture. *Nigerian Society of Animal Production*, 26:189-191.
546. Ebenebe, C.I., (2001). Alleviation of rural poverty, in Nigeria through minilivestock Production. *Nigerian Society of Animal Production*, 26:144-146.
547. Esuga, P.M., 2001. Private Sector participation in Animal Production for Poverty Alleviation. *Nigeria Society of Animal Production*, 26: Kaduna
548. Igene, F.U., E.E. Ikheloa, and S.O. Oboh, 2005. Poultry egg glut and management: A case study of commercial poultry farms in some selected local government Areas of Edo state. *Nigeria society of Animal production*, 30:133-135.
549. Ikani, E.I., I.I. Dafwang, D.O. Chikwendu, A.O.K. Adesehinwe, A.I. Annate, and I.E.J. Iwuanyawu, 2001. Soci- economic characteristics of and sources of feeds for poultry and pig farmers in Nigeria. *Nigeria society of Animal Production*., 26: 250-253.
550. Kabir, J., V.J. Umoh, E. Audu-Okoh, J.U. Umoh, J.K.P. Kwaga, 2004. Drug Use in poultry Farms and Determination of Antimicrobial Drugs Residues in Commercial Eggs and Slaughtered Chickens in Kaduna State, Nigeria. *Food Control* 15: 99-105. (2004).
551. Longtau, S.L., R.P. Gobum and M.J. Gowon, 2004. CMPS (Chicks Multiplication and Production System). A Low cost Technology Crafted by DART. DART Information Service, Jos, Nigeria.
552. Oyedeji, G.O., 2001. Private Sector Participation in Animal Production for Poverty Alleviation. *Nigeria Society of Animal Production*, 26. Lagos.
553. Uchendu, C.N., 2001. The effect of surgical bursectomy along with hemicastration on the gonadal activity of babcock cockerels. *Nigerian Society of Animal Production*, 26:76-79.

HUSBADRY & MANAGEMENT

554. Abiola, S.S. and Oyebimpe, 2001. Effects of Egg incubation position in the table –Type mence of chicks. *Nigeria Veterinary Journal*, 22(1) 83-89.
555. Adewunmi, B.A. (2004). Preliminary studies on A. C./D. C heat source cum kerosene lantern for egg incubation. *Nigerian Journal of Animal Production* 31(1), 32-39.
556. Adeyinka, A.I., Abubakar, B.Y., Oni, O.O., Sekoni, A.A., Nwagu, B.I. and Olorunju, S.A.S. (2004). Sources of variation in shika bred layer-type chickens. *Tropical Journal of Animal Science*. 7(1), 113-118.
557. Adeyinka, I.A., B.Y. Abubakar, O.O. Oni, N.I. Dim, O.E. Asiribo, A.A. Sekoni, B.I. Nwagu, F.D. adeyinka, G.T. Iyeghe, 2001. Short Time Responses to Selection in Layer type Chickens: Direct and Correlated Responses to Selection for Egg Production to 280 days. *Journal for Sustainable Agriculture and the Environment*, 3(2): 361-368.
558. Ayo J.O. and N.S. Minka, 2004. Some major constraints on ostrich productivity in northern Nigeria. proceedings of the 14th animal scientific conference of the animal science association of Nigeria, Sept 13th -16th 2004, Abakiliki, pp 155-158.
559. Bale, O.O.J., A.A. Sekoni, C.N. Kwanashie, 2002. A case study of possible health hazards associated with poultry houses. *Nigerian Journal of Animal production*, 29(1): 102-112.
560. Bawa, G.S., M.K.Joel, and A.E.O. Malam-Abduli, 2001. Effects of age, season and year on egg Production and mortality. *Nigerian Society for Animal Production*, 26(1)36-39.
561. Dafwang, N.C., 2005. Production Efficiency of Chick’s Multiplication and Production System (CMPS). A Case Study from Plateau State. An M.Sc. Research Proposal Seminar, Department of Agricultural Economics and Rural Sociology, A.B.U. Zaria.
562. Duru, S., G.N. Akpa, L. Sa’idu., T.S. Olugbemi and A. Jokthan, 2006. preliminary study on duck management under periurban system. *Livestock research for rural Development*, 18(3): 1-4
563. Ezekwe, A.G and Machebe, N (2004). Ejaculate characteristics of two genotypes of Nigerian local cocks. *Proc. Annul. Conf. Anim. Sci. asso. Nig.*
564. Hassan, W.A. and B. Bello. 2002. Growth performance of intensively raised squabs in Sokoto. *In: Aletor, V.A. and G.E. Onibi (Eds.). Increasing Household Protein Consumption through Improved Livestock Production. Proceedings of the 27th annual conference of the Nigerian Society for Animal Production (NSAP), Federal University of Technology, Akure, 17 - 21 March, 2002, p. 177 - 179.*
565. Ikheloa, E.E., and F.U. Igene, 2005. Prodigality in commercial Egg production in some selected Local Government Areas of Edo state. *Nigeria society of animal production* 30:130-132.
566. Minka, N.S (2003). Evaluation of the performance of farmed Ostrich chicks to juvenile age in northern Nigeria. *Trop. J. Anim. Sci.* 6(1): 69-73
567. Mmereole, F.U.C., I.O.U. Emegha, L. Bratte, and S.I. Omeje, 2001. Short term body weight comparison of Harco cockerels under 2 housing types. *Nigerian Society of Animal Production.*, 26: 265-267
568. Nnadi, P.A., and B.C.O. Omeke., 2002. Seasonal variations in the laying pattern and egg quality of Harco hens in the humid tropics . *In: PCNVMA*, pp. 84-92
569. Nwanta, J.A., E.C. Okolocha and J.K. Alli-Balogun, 2003. Poultry Production n Kaduna state Nigeria Constraints and Prospects. *Sokoto Journal of Veterinary Sciences*, 4(2).
570. Nwanta, J.A.; Okolocha, E.C. and Alli-Balogun, J.K (2002). Poultry production in Kaduna State, Nigeria “Constraints and prospects”. *Sokoto Journal of Veterinary Science (SJVS)*; 4 (2). Pp 12 - 15.
571. Nweze, B.O., Ezzea, C.C. and Otuma, M.O. (2003). Effect of preservative agents on qualities of table eggs. *Trop. J. Anim. Sci.* 6(1): 63-68
572. Obikaonu, H.O. and A.B.I. Udedibie, 2004. Performance of young growing pigs and finisher broilers housed together. *Nigeria Journal of Animal production*, 31(1) 40-44.
573. Odunsi, A.A., Farinu, G.O. and Togun, V.A. (2002) Diet manipulation and post-moulting responses in caged commercial laying hens. *Nigerian Journal of Animal Production* 29(1), 11-15.
574. Ogundipe, S.O. and S.A. Sani, 2002. Economics of Poultry Production in Nigeria. *In: J.O. Gefu, I.A. Adeyinks and A.A. Sekoni (eds). A Training Manual on National Training Workshop on Poultry Production in Nigeria. National Production Research Institute (NAPRI), ABU, Zaria, Nigeria, Pp.27-45.*
575. Oke, U.K., Herbert, U. and Joseph, K. (2005) Photostimulated changes in egg production and reproductive performance of the Guinea fowl in a sub-humid tropical environment. *Nigerian Journal of Animal Production* 32(2), 315-320.
576. Okoruwa, V.O., A.E. Obayelu, and Ikoyo-Eweto. 2004. Profitability of semi intensive and intensive egg production in southwest and south –south zones of Nigeria. *Nigeria Journal of Animal production*, 33 (1) 118-121.
577. Ola, S.I., Daniyan, O.C., Thomas, K.D and P. A. Olubunmi, P.A. (2002) Effect of contact with male on the

- physical and chemical qualities of eggs of black harco layers. *Nigerian Journal of Animal Production* 29(1),127-131.
578. Oluyemi, J.A and F. A. Roberts, 2000. Poultry production, In: *Poultry production in Warm Wet Climates*, Second Edition, Macmillan publishers Ltd., London. Pp. 178-197.
 579. Omeje, S.I., Nweze, B.O. and Chinyereugo, J. (2001): The pecking, resting and feeding behaviour of four broiler strains in a humid tropical environment. *Nigerian Journal of Animal Production* 28(1),103-107.
 580. Oni, O.O., N.I. Dim, B.Y. Aburbakar, E.O. Asinibo, 2001. Egg Production Curve of Rhode Island Red Chickens. *Nigerian Journal of Animal Production*, 28(1): 78-83.
 581. Oni. O.O., B.Y Abubakar. N.I. Dim, O.E. Asiribo, and I.A. Adeyinka, 2001. Productive ability of egg production models. *Nigerian Journal of Animal Production*, 28(1)84-88.
 582. Peters, S.O., C.O.N. Ikeobi, M.O. Ozoje, and Adebambo. 2005. Modeling growth in seven chicken genotypes. *Nigerian Journal of Animal Production*, 32(1) 28-38.
 583. Rekurst, P.I., 2002. Artificial Insemination in poultry In: Gefu, J.O., Sekoni, and A.I Adeyinka (eds) *Poultry Production in Nigeria. A Training Manual*, pp. 46-51.
 584. Sekoni, A.A. 2002. Management of Layers and Breeders. In: *Poultry Production in Nigeria* (Gefu, J.O., I.A. Adeyinka and A.A. Sekoni eds) held 1st – 6th Sept. 2002 at NAPRI Shika, Nigeria. Published by National Production Research Institute, Ahmadu Bello University Shika, Zaria, Nigeria
 585. Sekoni, AA., 2002. Management of Layers and Breeders. In: *Poultry Production in Nigeria* (Gefu, J.O., I.A. Adeyinka and A.A. Sekoni eds) held 1st – 6th Sept. 2002 at NAPRI Shika, Nigeria. Published by National Production Research Institute, Ahmadu Bello University Shika, Zaria, Nigeria
 586. Togun, V.A., Amao, O.A., Farinu, G.O. and Onyioha, S.U. (2005). Effect of hen location in battery cage on egg production of Bovans Nera Black hens. *IJAAAR* 2(1), 76-82.
 587. Udeh, I and S.I. Omeje, 2005. Heterosis for egg production in native by exotic inbred chicken crosses. *Nigerian Journal of Animal production*, 32 (1) 7-20.
 588. Udeh, I. (2003). A comparison of the pecking and resting behaviour of native and exotic (layer type) chicken in a humid tropical environment. *Trop. J. Anim. Sci.* 6(1): 81-85
 589. Ugwu, S.O.C.; Ude, I: and Ojeh, A.I (2000). Comparison of the physical characteristics of semen under different collection frequencies in the native and exotic cocks. *Trop. J. Anim. Sc.*
 590. Utibe-Abasi, U. S.A. Offiong, and F.A.Akpan, 2001. Effects of practical deprivation on performance characteristics and carcass qualities of broiler chickens in the humid tropics. *Nigeria Society of Animal Production* , 26: 214-216.