

Poultry sector country review



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This review is based on the following report:
The structure and importance of the commercial and village
based poultry industry in Nigeria

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Foreword

The unprecedented widespread outbreaks of Highly Pathogenic Avian Influenza (HPAI) that occurred in many countries in Asia, Europe and Africa since 2003 have been asking for rapid and active response on a national, regional and international level. The HPAI crisis had to be addressed worldwide at the source, which is the poultry population.

The main danger of this disease, like others, lies in the way in which humans interact with and handle the production, distribution, processing and marketing of live poultry and poultry products. The direct and indirect socio-cultural and economic impacts of disease outbreaks influence policy measures and disturb markets, causing the loss of assets. There are strong negative impacts on the livelihoods of rural communities for all producer groups including small holders. Assessment and guidance on measures along the poultry chain for a safe poultry production is therefore of great importance. Specific consideration should be given to strategies and measures that ensure a sustainable pro poor supporting approach and development.

Better understanding of the specific situations of the different poultry sectors and the related market chains will help to develop appropriate disease control measures and improve biosecurity.

This review is part of a series of Country Reviews that are commissioned by the Animal Production Service (AGAP) of the Food and Agriculture Organization of the United Nations (FAO) for the Socio-Economics, Production & Biodiversity Unit of the Emergency Centre for Transboundary Animal Disease of FAO (ECTAD).

This review is intended as a resource document for those seeking information on the poultry sector at national level. It is not exhaustive. Some topics are only partially covered or not covered at all and the document will be supplemented and updated on an ongoing basis. Contributions and feedback are welcome by the author(s), FAO/AGAP and FAO/ECTAD Socio-Economics, Production & Biodiversity Unit¹.

The original report by D.F. Adene and A. E. Oguntade was edited by Ms Jenny Schwarz in August 2008 and has been supplemented with data from the FAO statistical database (FAOSTAT), the World Bank and the United Nations Population Division.

¹ For more information visit the FAO website at: www.fao.org/avianflu/en/farmingsystems.html or contact either Philippe Ankers or Olaf Thieme, Animal Production Officers Email: Philippe.Ankers@fao.org and Olaf.Thieme@fao.org Food and Agriculture Organisation, Animal Health and Production, Viale delle Terme di Caracalla, 00153 Rome, Italy

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Acronyms and abbreviations

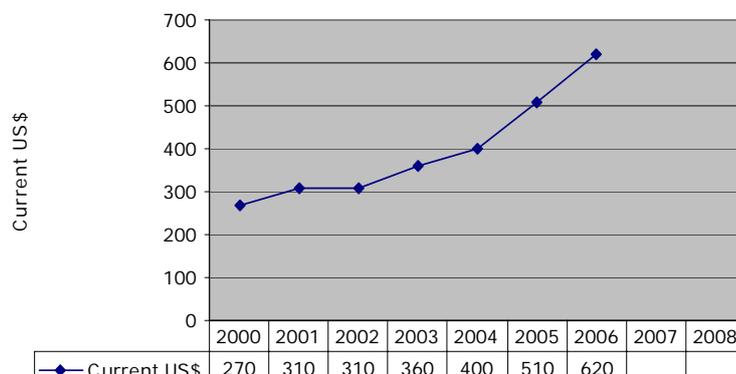
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|--------------|---|
| ABU | Ahmadu Bello University |
| CDC | Center for Disease Control, USA |
| DFID | Department for International Development |
| DOC | Day old chicks |
| EU | European Union |
| FAO | Food and Agricultural Organisation of the United Nations |
| FVM | Faculty of Veterinary 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 African Union |
| LGA | Local Government Area |
| LIDP | Low Inputs Dependent Production |
| NBS | National Bureau of Statistics |
| ND | Newcastle disease |
| 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 |
| UI | University of Ibadan |
| USAID | United States Agency for International Development |
| WHO | World Health Organisation |
| WPSA | World Poultry Science Association |

Chapter 1

The country in brief

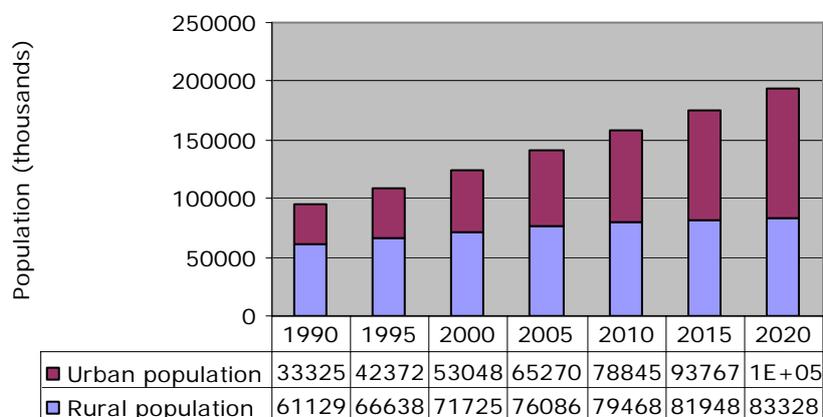
| | | |
|--------------------------|--|-------------------------------|
| Country: | Nigeria | |
| Location: | Western Africa, bordering the Gulf of Guinea, between Benin and Cameroon | |
| Population, total | 144,719,953 (2006) | Source: World Bank, July 2008 |
| Population, growth rate: | 2% (2006) | Source: World Bank, July 2008 |
| Economy group: | Low income | Source: World Bank, July 2008 |

FIGURE 1: **Gross national income (GNI) per capita**
(Atlas method, current US\$)



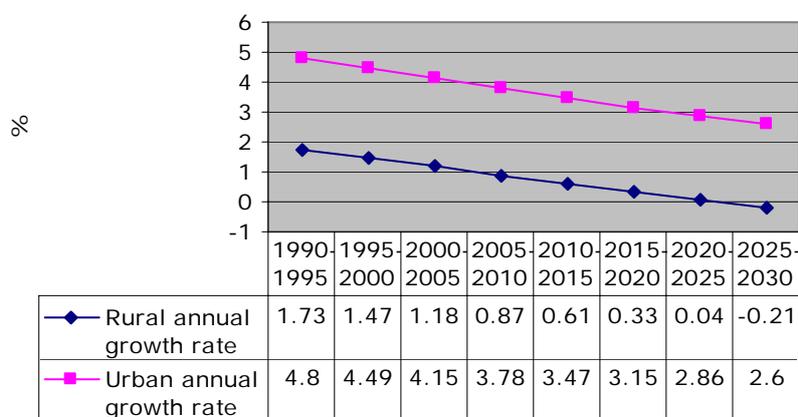
Source: The World Bank Group World Development Indicators, July 2008

FIGURE 2: Demographic profile



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2007 Revision, <http://esa.un.org/unup>, July 2008

FIGURE 3: Annual population growth rates

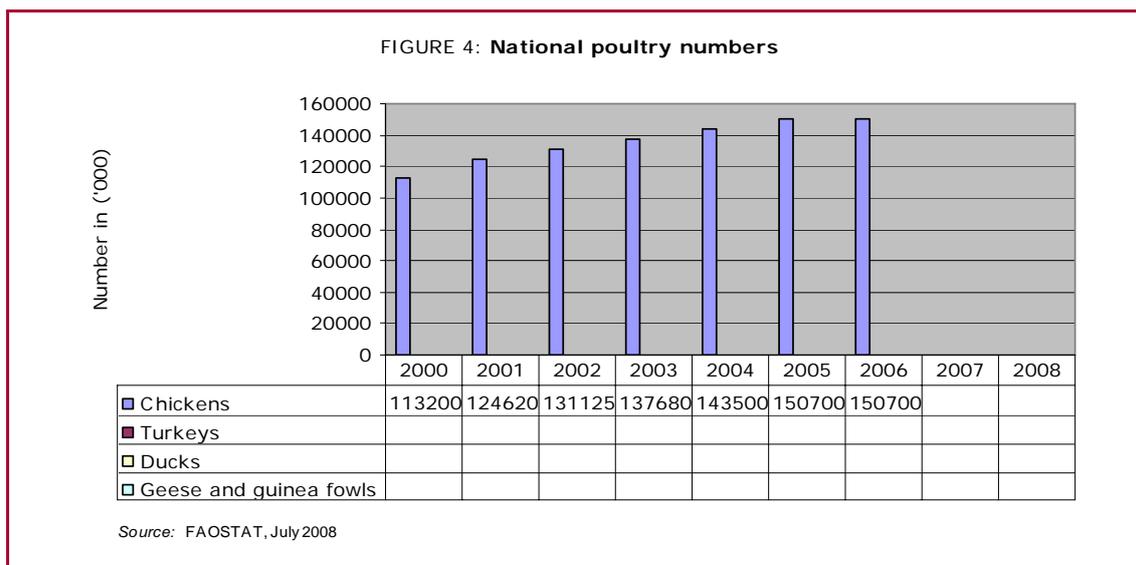


Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2007 Revision, <http://esa.un.org/unup>, July 2008

Chapter 2

Profile of the poultry sector

2.1 NATIONAL POULTRY FLOCK



At the time of writing, there was no comprehensive information on the size of the poultry sub-sector in Nigeria based on an up-to-date survey. The most recent survey was carried out by the National Bureau of Statistics (NBS, formerly Federal Office of Statistics) in 2005. Data was still being processed at the time of writing the initial report. The 2003 survey covered the whole livestock sector, but the information generated on poultry rearing in the survey excluded commercial poultry production activities (ie Sectors 1, 2 and 3). The information available from the survey had a number of other shortcomings. There was no information on Lagos and Bayelsa States and the false assumption was made that there is no rural poultry in these two states. Secondly, the survey, even though it covered information on flock size, did not capture information on flock structure. The figure 4 provide however an estimate of the poultry number.

2.2. GEOGRAPHICAL DISTRIBUTION OF POULTRY FLOCKS

The table below shows the projected population of poultry in Nigeria as presented by the Federal Department of Livestock and Pest Control Services (dated 2003). The table puts the estimated population of poultry in Nigeria in the year 2003 as 137,679,000 (115,880,864 (84%) backyard poultry and 21,798,079 (16%) exotic poultry). However, this distribution within the population does not take into account the fact that there are commercial poultry farms based on exotic birds being operated on a backyard poultry basis and that subsistence household poultry rearing can be based on exotic birds, particularly around cities. The exotic birds have higher productivity and provide the opportunity for a higher annual off-take, especially when reared under intensive commercial production systems. A census is needed.

TABLE 1:
Distribution of poultry in Nigeria (2003 estimate)

| 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% | |

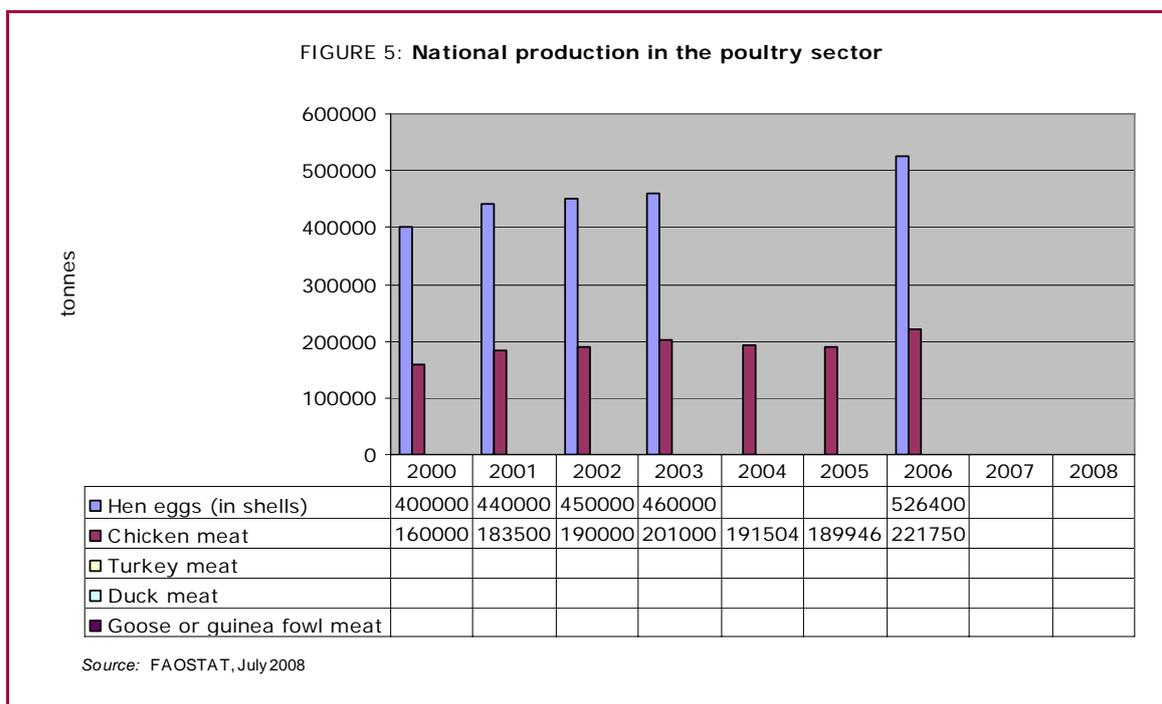
Source: Federal Ministry of Agriculture and Rural Development, Federal Department of Livestock and Pest Control Services. Highly Pathogenic Avian Influenza Standard Operating Procedures, February 2006.

**TABLE 2:
Distribution of subsistence poultry in Nigeria (2006 estimate)**

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

Source: Extrapolation by the author (2006)

2.3 PRODUCTION



2.4 CONSUMPTION

Figure 6.a and 6.b: Poultry meat (in average calories/capita/day) (in kg/capita/year)

This information has not yet been sourced

Figure 6.c and 6.d: Eggs (in average calories/capita/day) (in eggs/capita/year)

This information has not yet been sourced.

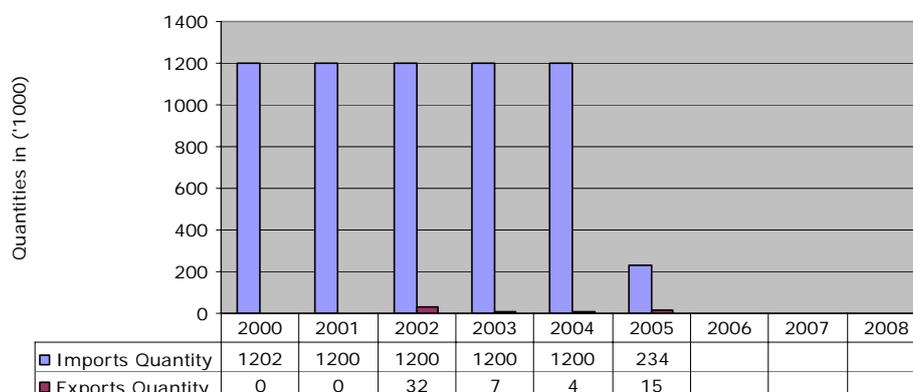
Among Nigerians, poultry meat and eggs are to some extent still considered luxury foods. In the rural areas - where household incomes are significantly lower than the national average - consumption of poultry is reserved for special occasions. Usually the source of the eggs and poultry meat consumed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

In urban areas, poultry meat is consumed more often due to the relatively higher level of income, the ready availability of poultry meat either as fresh or frozen products and chains of fast food outlets whose recipes and menus are rich in chicken meat and eggs. Nonetheless, the consumption of poultry meat is largely occasional for most families even in the urban centres. However, eggs are more routinely consumed in the daily diet in the urban areas.

At the time of writing, most of the final poultry products are consumed domestically, with a small proportion being exported to neighbouring West African countries.

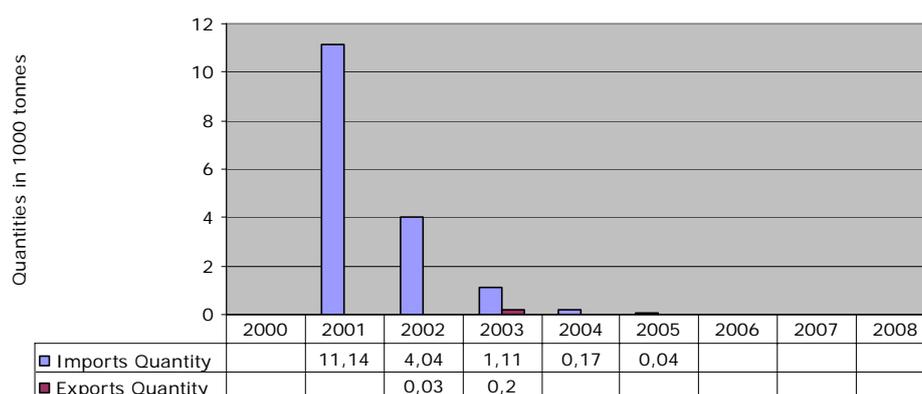
2.5 TRADE

FIGURE 7.a: Import/Export of live chickens (up to 185 g. only)



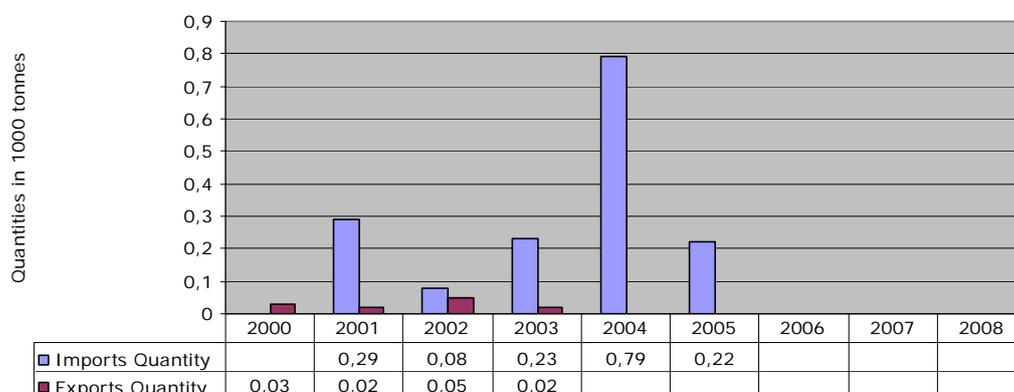
Source: FAOSTAT, July 2008

FIGURE 7.b: Import/Export of chicken meat



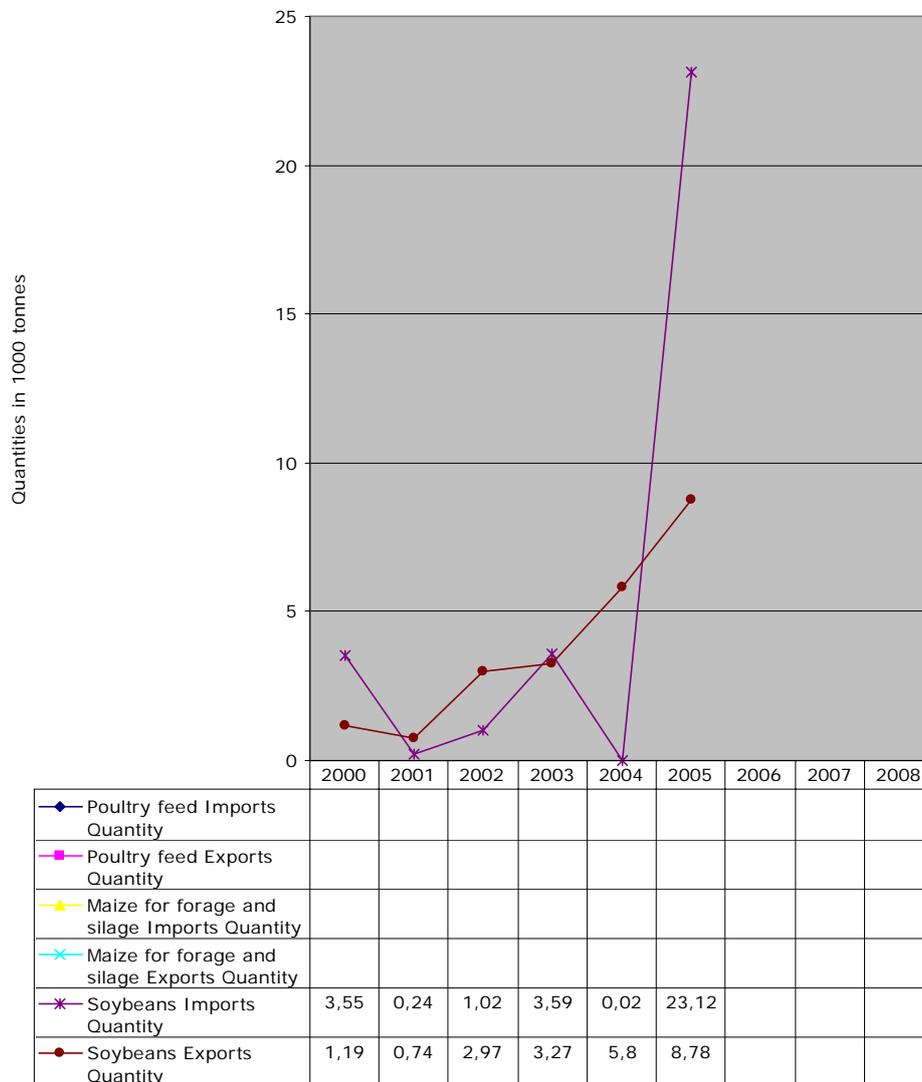
Source: FAOSTAT, July 2008

FIGURE 7.c: Import/Export of hen eggs with shells (including hatching eggs)



Source: FAOSTAT, July 2008

FIGURE 7.d: **Import/Export of poultry feed and feed ingredients (maize, soybeans)**



Source: FAOSTAT, July 2008

2.6 PRICES

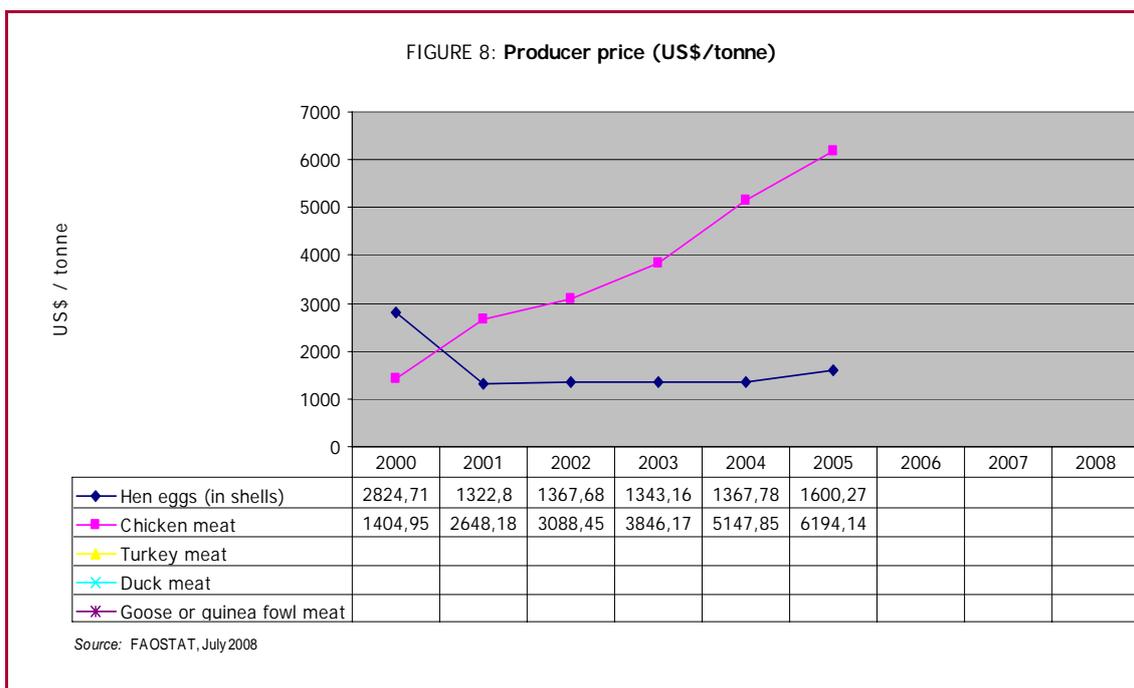


Figure 9: Consumer price (US\$/tonne)

This information has not yet been sourced.

**TABLE 3:
Consumer price (Naira/unit)**

| Items | 2001 | 2002 | 2003 | 2004 | 2005 |
|--------------------------|----------|----------|----------|----------|----------|
| 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 | - |
| 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 |

Source: Federal Livestock and Pest Control Department, 2006

The major determinants of product pricing are production costs and the season. There is usually a seasonal peak in the demand for poultry meat in December (Christmas/New Year festivals) and April (Easter Festival). The demand for eggs is fairly stable all year round. The current 2006 average price of products at farm gate are 750 Naira for a broiler P.S; 800 Naira for a layer P.S; 120 Naira for a commercial P.X; 130 Naira for a commercial B.X and 350 Naira per kg for dressed broiler.

The proportion of household expenditure devoted to poultry products provides an indication of the importance of poultry in household food security. National and household expenditure estimates on poultry meats and eggs are however not available as a household expenditure survey has not been carried out by the National Bureau of Statistics for several years.

Chapter 3

Poultry production systemsTABLE 4:
FAO classification of poultry production systems

| Sectors (FAO/definition) | Poultry production systems | | | |
|--------------------------------------|----------------------------------|----------------------------------|----------------------------------|---|
| | Industrial and integrated | Commercial | | Village or backyard |
| | | Bio-security | | |
| | | High | Low | |
| Sector 1 | Sector 2 | Sector 3 | Sector 4 | |
| Biosecurity | High | Mod-High | Low | Low |
| Market outputs | Export and urban | Urban/rural | Live urban/rural | Rural/urban |
| Dependence on market for inputs | High | High | High | Low |
| Dependence on goods roads | High | High | High | Low |
| Location | Near capital and major cities | Near capital and major cities | Smaller towns and rural areas | Everywhere. Dominates in remote areas |
| Birds kept | Indoors | Indoors | Indoors/Part-time outdoors | Out most of the day |
| Shed | Closed | Closed | Closed/Open | Open |
| Contact with other chickens | None | None | Yes | Yes |
| Contact with ducks | None | None | Yes | Yes |
| Contact with other domestic birds | None | None | Yes | Yes |
| Contact with wildlife | None | None | Yes | Yes |
| Veterinary service | Own Veterinarian | Pays for veterinary service | Pays for veterinary service | Irregular, depends on govt vet service |
| Source of medicine and vaccine | Market | Market | Market | Government and market |
| Source of technical information | Company and associates | Sellers of inputs | Sellers of inputs | Government extension service |
| Source of finance | Banks and own | Banks and own | Banks and private ² | Private and banks |
| Breed of poultry | Commercial | Commercial | Commercial | Native |
| Food security of owner | High | Ok | Ok | From ok to bad |

Sector 1: Industrial integrated system with high level of biosecurity and birds/products marketed commercially (e.g. farms that are part of an integrated broiler production enterprise with clearly defined and implemented standard operating procedures for biosecurity).

Sector 2: Commercial poultry production system with moderate to high biosecurity and birds/products usually marketed commercially (e.g. farms with birds kept indoors continuously; strictly preventing contact with other poultry or wildlife).

Sector 3: Commercial poultry production system with low to minimal biosecurity and birds/products entering live bird markets (e.g. a caged layer farm with birds in open sheds; a farm with poultry spending time outside the shed; a farm producing chickens and waterfowl).

Sector 4: Village or backyard production with minimal biosecurity and birds/products consumed locally.

² Money lenders, relatives, friends, etc.

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 backyard but mostly extensive poultry production. The major features of these operational sectors are shown in the table below.

3.1 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 nation's 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 non-oil foreign exchange earnings are contributed by the agricultural sector. The poultry sub-sector is the most commercialised of all the sub-sectors of Nigeria's agriculture. There is however no comprehensive data or current data on this sub-sector, making proactive intervention and planning difficult. The global spread of Highly Pathogenic Avian Influenza (HPAI) across several countries since 2003 and the confirmation of the epidemic in Nigeria in February 2006, led to new attention being focused on the poultry sub-sector by the Government of Nigeria and the international community.

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 chickens predominate. There are two distinct poultry production systems in Nigeria, as in most developing countries of Africa and Asia. The two systems are conventionally referred to as commercial poultry production and rural poultry production. The commercial system is industrial in nature and therefore based on large, dense and uniform stocks of modern poultry hybrids. It is capital and labour intensive and demands a high level of inputs and technology. On the other hand, rural poultry production is by convention a subsistence system which comprises of stocks of non-standard breeds or mixed strains, types and ages. It is generally 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.

However, between these two distinct systems, 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 the poultry sector, intermediate grades which constitute what has now been termed "village or backyard poultry" can be comprised of rural or indigenous poultry types, a mixture of both indigenous and exotic hybrids or even purely 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 species in household poultry production to tens or hundreds of thousands of chickens in commercial production. These two distinct production scales and systems as well as the range of the intermediate types have been conveniently grouped by FAO into four operational sectors (see table 4). Table five provides additional information on the distinction between the four sectors in the Nigerian context.

TABLE 5:
Major features of the four production sectors

| Major features | Sector 1 | Sector 2 | Sector 3 | Sector 4 |
|----------------------------|-------------|----------|-------------|----------|
| Integration Scale | High & Full | Medium | Minimal/Nil | Nil |
| ▪ Grand Parent Stock | ✓ | x | x | x |
| ▪ Parent Stock | ✓ | x | x | x |
| ▪ Hatcher | ✓ | x | x | x |
| ▪ Intensive system | ✓ | ✓ | ✓ | x |
| ▪ Mixed species | x | x | x | ✓ |
| Inputs Scale | | | | |
| ▪ Own feed mill | ✓ | ✓ | x | x |
| ▪ Own electricity | ✓ | ✓/x | x | x |
| ▪ Own water system | ✓ | ✓/x | x | x |
| ▪ Own vet, vacc and drugs | ✓ | ✓/x | x | x |
| Bio-security Scale | | | | |
| ▪ Perimeter fence-guard | ✓ | ✓ | ✓ | x |
| ▪ Specified housing | ✓ | ✓ | ✓/x | x |
| ▪ Movement restriction | ✓ | ✓ | ✓/x | x |
| ▪ Staff hygiene, showering | ✓/x | ✓/x | x | x |
| ▪ Facility; equip hygiene | ✓ | ✓ | ✓ | x |
| ▪ All-in all-out site | ✓/x | ✓/x | ✓/x | x |
| Products | | | | |
| ▪ Parent stock DOC | ✓ | x | x | x |
| ▪ Comm DOC | ✓ | x | x | x |
| ▪ Table eggs per farm | ✓/x | ✓✓ | ✓✓ | ✓ |
| ▪ Meat or broiler | ✓/x | ✓✓ | ✓ | ✓ |
| Further Processing | ✓/x | ✓/x | x | x |
| Economic roles | | | | |
| ▪ Labour generating scale | ✓✓✓ | ✓✓ | ✓ | x |
| ▪ Import & Export | ✓✓ | ✓ | x | x |
| ▪ Rural / Culture Impact | ✓ | ✓ | ✓/x | ✓✓ |

3.2 SECTOR 1: INDUSTRIAL AND INTEGRATED PRODUCTION

The industrial integrated sector serves as the foundation to the entire commercial production system by virtue of the possession of GPS and PS. In line with global trends in the poultry industry, this sector is made up of a small number of fully and vertically integrated holdings, supported by the necessary capital and technical facilities. For these reasons, most operations of this kind on the Poultry Association of Nigeria (PAN) list are rooted on foreign franchise or joint ventures or have links to Europe. The list and production profile of Nigeria's poultry foundation stock are shown in the table below.

TABLE 6:
List of GPS/PS/Hatchery Companies (Foundation Stock)

| Company | Products |
|---|--|
| Obansanjo Farms Nig. Ltd., Ogun State | 1. PS-DOC, 2. Equipment, 3. Broiler DOC, 4. Pullet DOC, 5. Frozen chicken, 6. Cockerels |
| CHI Ltd (AJANLA FARMS) Oyo State, Farm HQ. Lagos State. | 1. PS D.O.C, 2. POL pullets, 3. Boiler DOC, 4. Emus, 5. Pullet DOC, 6. Equipment, 7. Table eggs, 8. Drugs, 9. Cockerels |
| AVIAN SPECIALITIES Ltd, Oyo State. | 1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Cockerels |
| ZARTECH FARMS, Oyo State | 1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen Chicken, 5. Further Processed Chicken, 6. Cockerels |
| AMO FARMS, Oyo State | 1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Feeds, 5. Cockerels |
| TUNS FARMS, Oshun State | 1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Feed concentrates, 5. Cockerels |
| LIPAKALA FARMS, Ondo State | 1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Dressed chicken |
| S & D FARMS, Ogun State | 1. P/S DOC, 2. Broiler DOC, 3. Pullet DOC, 4. Eggs, 5. Dressed chicken, 6. Cockerels |
| NIYYA FARMS Ltd. Kaduna State | 1. Day old chicks, 2. Eggs |

The nine major producers listed in PAN's record represent about 70% of the sector. There are also a few other medium to small-scale or limited hatchery producers in Nigeria. Examples of such unlisted hatcheries are:

- a) The Mayfield Hatchery, Ajah, Lagos
- b) Akpata Hatchery, Epe Rd, Lagos
- c) Alanco Farms Hatchery, Abeokuta
- d) Farm Fender Hatchery, Ilishan, Ogun
- e) NAPRI Hatchery, Shikka Zaria
- f) Kaduna Hatchery

The majority of these other hatcheries are active, each producing tens or hundreds of thousands of chicks weekly while a minority (e.g. Kaduna) have closed down production.

The data available from the PAN on the capacity of the commercial sector is as follows.

TABLE 7:
Grand Parent Stock (GPS) and Parent Stock (PS) production capacity
(Pre - HPAI Epidemic) Grand Parent Stock (GPS)

| | | | |
|--------------------------|-------------------|-----------------------|------------------------|
| GPS Heavy Breeds | 46,000 | | 1, 308,125 PS/year |
| GPS Light Breeds | 33,000 | | 1, 543.750 PS/year |
| 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 |

Source: PAN, no date given

The estimated cost of mature GPS is N3000 and mature PS is N2000 per unit. Although the precise value of Nigeria's global integrated GPS and PS poultry stock is unavailable, the estimated stock value from a summary of the size of the sector (see table above) 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.

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

- a) GPS import, PS and day old chicks production
- b) Critical feed ingredients (lysine, methionine, fish meal and soya meal) import and utilization
- c) 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 below. The table shows that the annual production capacity of the commercial poultry sector in Nigeria is estimated as 96,981,000 kg dressed broilers, 40,738,700 kg dressed culled layers and 8,216,208,000 eggs (273,873,600 crates of eggs).

TABLE 8:
Estimates of commercial Poultry Production Capacity based on Grand Parent Stock and Parent Stock Capacities

| Estimated Annual Day Old Chicks production | |
|---|-------------------|
| 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) (in kg) | |
| 2.0 kg Live Weight | 138,544,287 |
| 70% Dressed Weight as Frozen Chicken | 96,981,001 |
| Frozen Chicken (Culled Layers) (in kg) | |
| 1.7kg Live Weight | 58,198,140 |
| 70% Dressed Weight as Frozen Chicken | 40,738,698 |
| Table Eggs (number units) | |
| Eggs | 8,216,208,000 |
| Crates of Eggs | 273,873,600 |

Housing and Husbandry Practices

The housing and husbandry practices for GPS and PS in Nigeria follow 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 high 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, forced the incorporation of environmental improvement systems like industrial or tunnel ventilator fans, foggers and cooling pads along with tree planting for shade. In recent times,

one of the major integrated operators in this sector located in South-West Nigeria introduced custom built closed environmental housing.

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.

Management and Hygiene practices

These cover the range of measures and practices relating to good housing, feeding and husbandry standards, including all-in-all-out systems to protect stock from disease predisposing factors, especially stress. It also specifically entails the application of daily hygienic precautions relating to 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 also fall under this area. The objective is to keep out infections and minimize the need for medication. Observance of these practices appears to vary widely in Nigeria.

For more information on preventive medication and vaccination, see chapter 6.2

Sector one products

In Sector one, products range from mainly PS DOCs to a combination of PS and commercial DOCs, which include pullet and broiler type DOCs. However, as shown in the table below, this sector also encompasses other integral complements like poultry housing equipment, feed mills and health inputs as well as facilities for further processing of poultry for meat.

TABLE 9:
Input support services in sector one

| Company | Products |
|---|---|
| FEED MASTERS Ltd | 1. Poultry feeds, 2. Concentrates |
| GRAND CEREALS Ltd., Plateau State, | 1 Poultry feeds, 2. Concentrates |
| POULTRY EQUIP FACCO W. AFRICA Ltd. | 1. Equipment, 2. Incubators, 3. Turkey projects. |
| BENDEL FLOUR MILLS Ltd. Edo State | 1. Poultry feeds, 2. Concentrates, 3. Drugs |
| TOP FEEDS Ltd. Delta State | 1. Poultry feeds, 2. Concentrates |
| ANIMAL CARE KONSULT, Ogun State | 1. Broiler DOC, 2. Pullet DOC, 3. Eggs, 4. Frozen chicken, 5. Feed concentrates, 5. Cockerels |
| NIYYA FARMS Ltd. Kaduna State | 1. Day old chicks, 2. Eggs |
| Several medium and small-scale holdings nation-wide | 1. Eggs, 2. Feeds, 3. Drugs, 4. Equipment |

3.3 SECTORS 2 AND 3: OTHER COMMERCIAL PRODUCTION SYSTEMS

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. 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.

Some of the farms in this sector are satellites of the Sector 1 companies, for the marketing of products and surpluses. Such surpluses arise from the failure of agents and customers to pick up ordered products. It is therefore not unusual for the apex companies to create facilities for rearing of such surpluses for the production of eggs and table birds. In other instances, the Sector 1 companies actually sponsor agents who serve to rear specified quantities of broilers on franchise, to feed their and other meat processing facilities. However, the 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 meat for the fast food outlets. These non-franchise producers source their own capital and operate independently from 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 high automation and bio-security measures. Their poultry stocks enjoy similar disease control measures to Sector 1, except that the vaccination schedules are not designed to achieve vertical integration/transfer of immunity. Many of them have their own feed mills and produce qualitative and cost-effective nutrition for their stocks. However, most of those in Sector 3 which represent the lowest level of commercial poultry are not as self-sufficient in inputs like feeds and disease control tools. While all operations in Sector 1 and the majority of those in Sector 2 maintain a complement of poultry veterinarians and nutritionists, those 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 use sub-standard veterinary inputs (e.g. vaccines without cold chain storage) or even to forgo some health inputs entirely.

The marketing and pricing structure for the two sectors is inevitably influenced by those in Sector 1. The bigger operators in Sector 2 actually compete with Sector 1 for a share of markets and pricing whilst the smaller Sector 3 operators are 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.

There has not been any comprehensive 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, the industrial capital of Nigeria. It is estimated that over 65% of Nigeria's commercial poultry is located in the 5 states of Lagos, Ogun, Oyo, Oshun and Ondo, whilst another 25 % is based in the 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 10 and the tables following reflect the location of the major operators in Sector 2. This list is not comprehensive, as it excludes Sector 3 which is composed of numerous small stock farms which could not be covered in the present study. Indeed, the current review has shown that there is a pressing need for a well planned, comprehensive and structured survey of Nigeria's poultry, beginning with the 3 commercial segments.

TABLE 10:
Selected Poultry Farms in Sectors 2 and 3

| | S/N | NAME | ANNUAL D.O.C. PROJECTION |
|--------------|-----|-------------------|--------------------------|
| LAGOS STATE | 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 |

| | S/N | NAME | OPERATION CAPACITY |
|--------------------------------------|-----|--|--------------------|
| EKITI, ONDO, DELTA AND EDO STATES | 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 IPKوبا SLOPE % EFO AGRIC | 3,500 |
| | 30 | ADA FARMS % EFO, 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 | |
| | 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 |

| | S/N | NAME | ANNUAL D.O.C. PROJECTION |
|-------------------------|-----|-----------------------|--------------------------|
| OYO, OSUN, KWARA STATES | 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 |
| | 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 |

| | S/N | NAME | OPERATION CAPACITY |
|------------|-----|-------------------------|--------------------|
| OGUN STATE | 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 |
| | 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 |

| | S/N | NAME | OPERATION CAPACITY |
|--------------|-----|------------------|--------------------|
| | 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 |

| | S/N | NAME | OPERATION CAPACITY |
|----------------------------|-----|-------------------------|--------------------|
| SOUTH-SOUTH/ SOUTH-EAST | 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 |

| S/N | NAME | OPERATION CAPACITY |
|--------------|----------------|--------------------|
| 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 |
| 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 |

| S/N | NAME | ANNUAL D.O.C. PROJECTION |
|--------------|------------------------|--------------------------|
| NORTH | 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 |

3.3.1 Breeding stocks and hatching eggs

See chapter 3.2

3.3.2 Broiler meat

See above

3.3.3 Hen table eggs

See above

3.3.4 Other species

This information has not yet been sourced.

3.4 SECTOR 4: VILLAGE OR BACKYARD PRODUCTION

TABLE 11:
Percentage of households keeping subsistence poultry by State

| 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 12 presents the number of own stocks slaughtered and sold by various households in the year 2005 in the country. The slaughtered stocks were consumed by the household and therefore constituted part of their food intake. Stock sold was either purchased for slaughter by other non-livestock rearing households - especially in urban communities - or added to the stock of other livestock rearing households.

TABLE 12:
Number of poultry slaughtered and sold from household stock by type, 2005

| Type | Slaughtered for household consumption | Sold |
|--------------|---------------------------------------|-------------------|
| 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 |
| Total | 15,089,637 | 21,641,907 |

Source: National Bureau of Statistics, 2006

Table 13 presents the estimates of poultry meat derived from own poultry stock slaughtered and consumed by households in 2005. The table shows that the estimated dressed weight of the poultry stock slaughtered is 16,239,246kg. This quantity is exclusive of poultry stock sold to earn income, which would either have been slaughtered/consumed by non-poultry keeping households or would have been added to the poultry stocks of other households.

TABLE 13:
Estimated poultry meat from households' own slaughter, 2005

| Type | Slaughtered for own use | 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: Estimates based on information available in table 12

3.4.1 Chickens

In its conventional sense, this category of poultry is rural 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 (ie over 70% Nigeria's population), the socio-economic importance of this category of poultry has been receiving increasing attention. In the process, the nomenclature in Nigeria and globally has been evolving to include terms such as family poultry, smallholder poultry, and village poultry. These reflect the inclusion of mixtures of exotic and indigenous poultry in this low input dependent production (LIDP) system. The effect of national and global attention on this sector over the decades has manifested itself in various interventions, including the cockerel introduction and exchange programmes and some limited extension and health input services that have resulted in some changes to the original structure and practices in the system. As a consequence, the "rural poultry" sector as currently constituted also includes isolated pockets of small-scale commercial mixed stocks with some housing and feeding inputs. This sector also covers some low to middle class peri-urban dwellers who 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." However, these are the exceptions and this section will therefore focus on the conventional rural poultry sector as practiced by the overwhelming majority of rural dwellers. Available data confirms that rural poultry is in essence a household and subsistence farming operation, with minimum stock

size, low input system production and equally low off-take capacity.

Most of these farmers manage their flocks extensively, allowing the birds to free range in the village and the surrounding area. The poultry are kept - mostly by women - both for household consumption and as an occasional income source.

There are no current reports on this sector 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 locations in the North, West and East of Nigeria. Five households per village in selected LGAs were covered in the study. The findings are presented in chapter 3.4.4 as a case study.

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 recent decades in Nigeria. Thus while the average household stock for chickens was 4.8 in 1983/84(FOS); 17.0 in 1989 (Otchere et al,1989) and 17.6 in 1990 (Adegbola,1990), the data from the limited survey described in chapter 3.4.3 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 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 a household study in Kaduna (North), Enugu (East) and Oyo-Ogun (West), as shown in Table 14 below. 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 declared that the population of rural poultry grew from 124 million to 149 million between 1979 and 1987.

TABLE 14:
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 |
| Chickens per HH | 14.7 | 15.5 | 17.1 |
| Chickens per capita | 2.2 | 2.4 | 3.7 |

Although most villagers keep two, three or even more poultry species, chickens remain the most common species of rural poultry kept in Nigeria. Older literature shows that between 65% and 88% of respondents included chickens in their household poultry stock. Although comparable data are currently unavailable, the figure from the case study show that between 51 to 67 % of all five household poultry species are chickens. Perhaps the only exception is among the Fulani who do not keep ducks because of the taboo that associates ducks with a 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, rural poultry are typically unconfined - especially in the day time - and are allowed to roam freely in the 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 trees. In some places they are provided with portable palm fronds or raffia baskets for night-time roosting. In some households, 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 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 is also influenced by the minimum input outlay of the rural poultry production system, owners also make more tangible efforts when it comes to feeding. Thus in most typical cases, the birds proceed to scavenge only after they have received offers of grains (corn, millet, sorghum) or by-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 sector, kitchen wastes and scraps or even some quantities of proprietary poultry feed are supplied as the main feed or as a supplement. All these are followed by scavenging for vegetables, wild fruits and seeds, grits, insects, maggots and earthworms which are believed to provide a considerable proportion and variety of nutrients for rural poultry.

The majority of rural poultry keepers provide water in some form of receptacle such as broken pots and calabashes, old pans or in plastic containers. The 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 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. It is obvious from all these that on average, nutritional inputs for rural poultry are subject to wide variations in quantity and quality; a situation which means that the outcome for the birds depends on their scavenging proficiency. The majority of keepers - mainly the household women and children - are generally interested in giving their poultry the best attention possible but they are handicapped by availability issues, such as limited water sources in the more arid localities.

Diseases losses and health measures

With the limited or non-existent provision for housing described above, 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; non-disease losses come from chilling, predators and in some cases pilfering. The major disease problems are Newcastle disease, pox, bursal disease, colisepticemia, coccidiosis and worm infestation. A previous report claimed that 60% of respondents listed Newcastle disease as the major disease in their poultry. A recent Federal Livestock Department 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 15).

TABLE 15:
Household ranking of major diseases of poultry

| | Kaduna | Enugu | Oyo-Ogun | Total | % |
|------------------------|--------|-------|----------|-------|-------|
| ND ranked first by HH | 46 | 53 | 41 | 140 | 78% |
| 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

Source: FAO/TCP study by Adene, (2000)

The rural/village poultry system typically lacks access to any organised health inputs. Attempts to institute health extension services have been constrained by the structure of the system such as 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 into 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 *Brtissum* spp 'Nchnwu' in Hausa, with *Capsicum annum* for treatment of diseased birds.

Productivity and Flock Profile

There is no recent or current data covering the productivity of rural poultry. Existing older 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 the 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 are in the collated summary in Table 16.

Table 16:
Productivity parameters in rural poultry

| Prod. parameters | chicken | ducks | guinea fowl | turkey |
|------------------------|-----------|----------|-------------|----------|
| Age at first egg, days | 159 | n/a | n/a | n/a |
| Eggs at 450days | 117.5 | | | |
| Ave. eggs/clutch | 8-12 | | | |
| Clutch duration, days | 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 months | 3.9 | 5.5 | 4.6 | 6.6 |
| Pre wean mortality % | 23.4 | 35.7 | 34.0 | 40.0 |

Source: Sonaiya(1990)

Products from Rural Poultry

The products from the rural poultry sector are eggs and meat. An overview from old literature and available comments shows that poultry mean more than eggs and meat (food) to the keepers. 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. 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.

3.4.2 Other species

Guinea fowls, which are the most prolific among the rural poultry species but poor hatchers and mothers, have most of their eggs sold for cash and food. Indeed, guinea fowl eggs are relished for their superior taste by Nigerians. On the other hand, pigeons are kept mainly for meat.

3.4.3 Case study

Date of case study: Summer 2006

There are no current reports on the small scale extensive poultry sector 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 locations in the North, West and East of Nigeria. Five households per village in selected LGAs were covered in the study. The numbers of the different species of poultry kept by households are presented in the following tables.

TABLE 17.a:
Family Poultry Sector: Summary from Household Stocks, Kano State, 2006

| LGAs& VILLAGES* | TOTAL IN 5 HOUSEHOLDS/VILLAGE | | | | | HOUSEHOLD 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 |
| 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 17.b:
Family Poultry Sector: Summary From Household Stocks, Jigawa State, 2006.

| LGAs&VILLAGES* | TOTAL IN 5 HOUSEHOLDS/VILLAGE | | | | | HOUSEHOLD 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 |
| 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 17.c:
Family Poultry Sector: Summary From Household Stocks, Oyo State, 2006

| LGAs&VILLAGES* | TOTAL IN 5 HOUSEHOLDS/VILLAGE | | | | | HOUSEHOLD AVERAGE | | | | |
|--------------------------|-------------------------------|--------|------|------|-------|-------------------|---------|------|------|-------|
| | Chk. | G.fwl. | Dks. | Tks. | Pgns. | Chk. | G.fwls. | Dks. | Tks. | 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 |
| IBANDAN 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 17.d:
Family Poultry Sector: Summary From Household Stocks, Enugu State, 2006

| LGAs&VILLAGES* | TOTAL IN 5 HOUSEHOLDS/VILLAGE | | | | | HOUSEHOLD AVERAGE | | | | |
|---------------------|-------------------------------|--------|------|--------|------|-------------------|------|--------|------|--------|
| | Chk. | G.fwl. | Chk. | G.fwl. | Chk. | G.fwl. | Chk. | G.fwl. | Chk. | G.fwl. |
| 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 |

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.

See chapter 3.4.1 for an interpretation of these results.

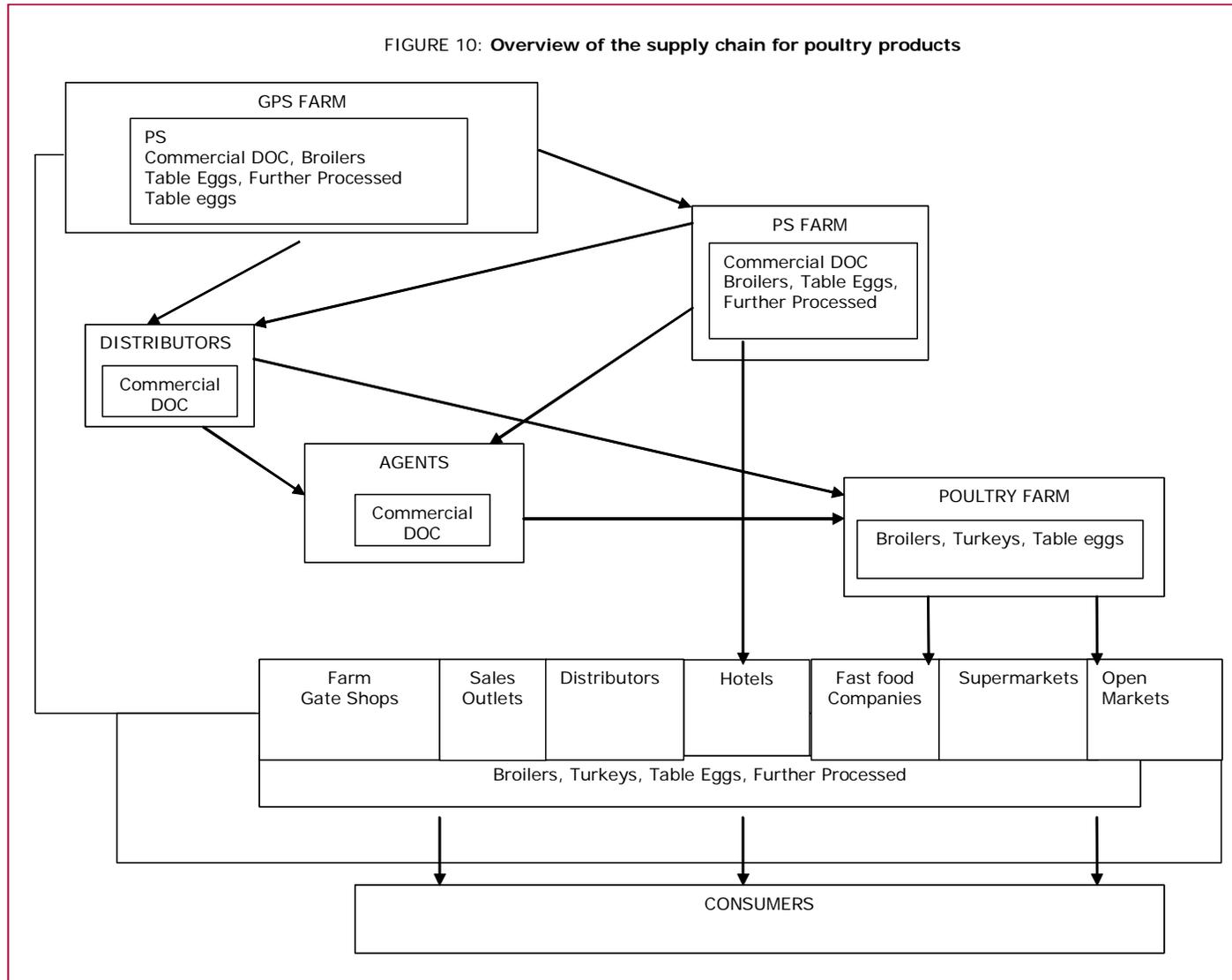
3.5 POULTRY VALUE CHAIN ANALYSIS

The main poultry products from the Nigerian poultry sub-sector are parent stock, commercial day old chicks, frozen chicken and table birds. The parent stocks are sold either directly to farms or through distributors or agents. Similarly, commercial day old chicks are also sold either directly to farms or through distributors or agents. Some of the agents are 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, namely:

- 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 at open markets to the final customers. An overview of the supply chain for poultry products is presented in Figure 10 below.



3.5.1 Day-old chicks

Detailed information has not yet been sourced.

3.5.2 Chicken meat

Detailed information has not yet been sourced.

3.5.3 Table eggs

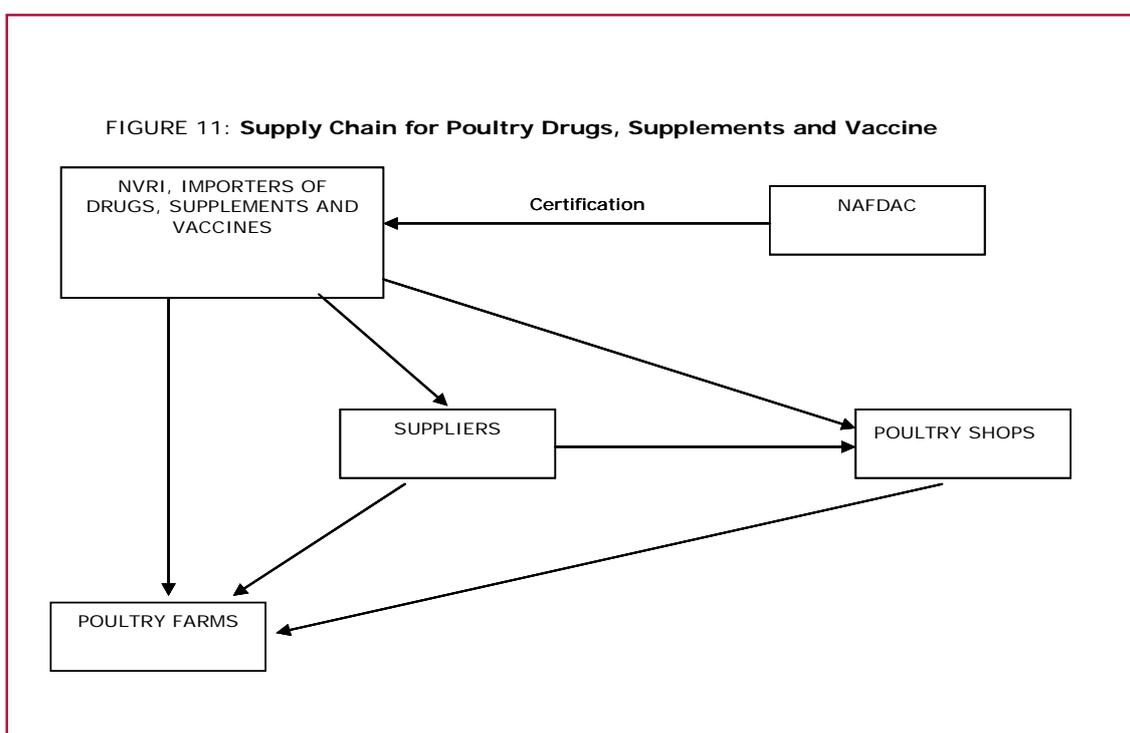
Detailed information has not yet been sourced.

3.5.4 Other species

Detailed information has not yet been sourced.

3.5.5 Veterinary drugs, supplements, vaccines, equipment

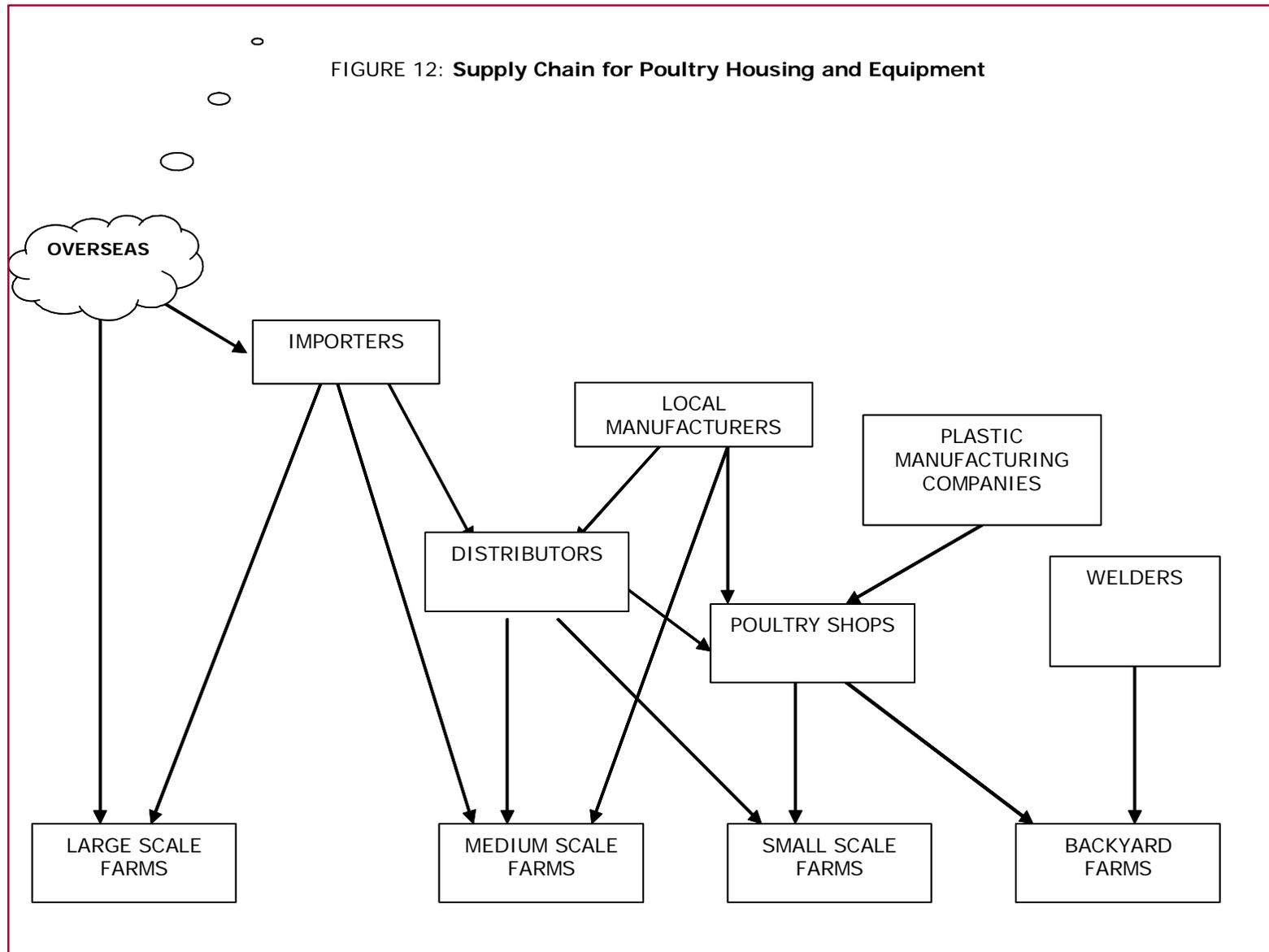
In Nigeria, there are major importers of poultry drugs, supplements and vaccines. NVRI also produces some quantities of vaccines locally. The large-scale poultry farms obtain their supplies either directly or through suppliers from these importers. The small to medium scale poultry farms obtain their supplies from the poultry shops, private sector poultry extension agents and occasionally from veterinarians. An overview of the supply chain for drugs, supplements and vaccines is provided below.



Other equipment

Apart from the poultry pens, which are usually custom-designed and built, the other housing equipment is usually procured already finished by the medium to large-scale poultry farms. They are a few major importers of poultry equipment among which are Dizengoff and FACCO. An overview of the supply chain for poultry housing equipment is presented below.

FIGURE 12: Supply Chain for Poultry Housing and Equipment



Chapter 4

Trade, marketing and markets

4.1 DOMESTIC MARKET

Transportation of Products

The transportation of poultry products is mainly by road, although occasionally, the air freighting of day-old chicks is carried out over long distances. Usually the big hatcheries transport day-old chicks in 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.

Live birds from the rural sector are sold mainly by women and children on village market days, which often attract buyers from other villages and urban market agents. Some of these 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.

Regional (Inter-State) Trade in Poultry Products

There is a concentration of commercial poultry farms based on exotic poultry in the South of the country (especially the South-West), while most of the rural poultry sector based on "indigenous" chicken and guinea fowl is found in Northern Nigeria. These regional specialisations 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, the 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 implications for the transmission of poultry disease. The movement of significant numbers of live poultry from the North to the South provides a potential route for the transmission of Avian Influenza and other poultry diseases. 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.

Table 18: Distribution of markets

This information has not yet been sourced.

4.2 IMPORT

The imports of chilled and frozen poultry meats into Nigeria for 2000 to 2005 are presented in Table 19. 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. This indicates the declining contribution of poultry imports to poultry product consumption in Nigeria.

TABLE 19:
Imports of Chilled and Frozen Poultry

| Year | Net Weight (kg) | Value (N) |
|-------|-----------------|---------------|
| 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

4.3 EXPORT

This information has not yet been sourced.

4.4 SLAUGHTERING FACILITIES

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 are also slaughtered in the abattoirs.

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

4.5 POULTRY FEEDS

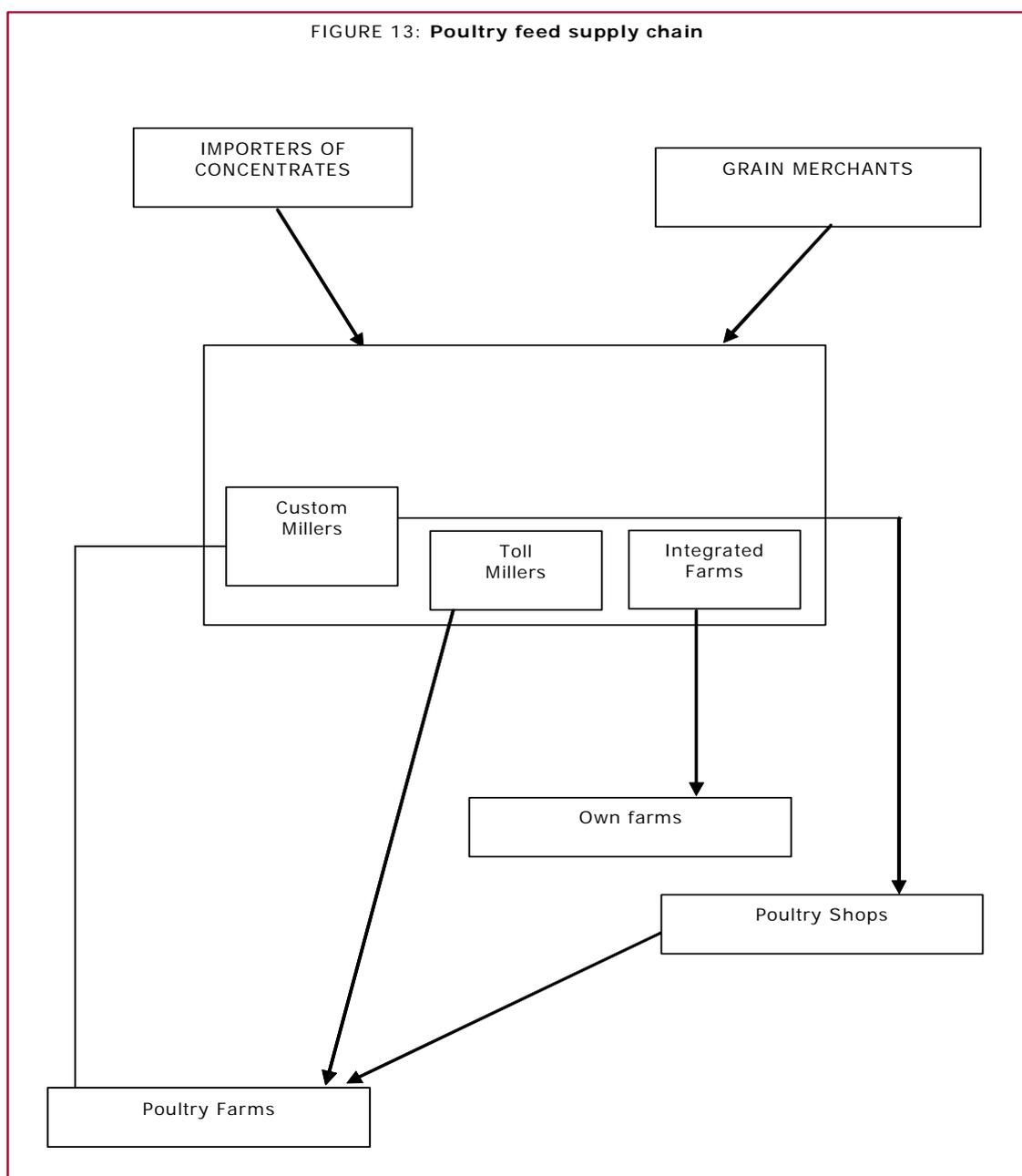
There are three types of feed millers, namely custom, toll and integrated farms. The custom millers mill and market their feeds under registered trade names. The dominant trade names in the market include Amo Sanders, Guinea Feed, Top Feed and Livestock Feed amongst others. Some of these custom millers 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 around small- to medium-scale poultry farms. They operate by milling feed to the specification of customers (poultry and catfish farmers) and charging a fee per quantity milled. The customers either bring their own 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 their 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 importers for the supply of imported feed ingredients such as fish meal, lysine methionine and soy meal etc. These importers also use intermediaries to reach the feed millers; these are spread across the country but have a higher concentration in the south.

Poultry shops generally market various inputs of the poultry sub-sector, one of which is branded feeds obtained from custom feed millers. Poultry farms that do not have their own feed mills therefore have the options of patronizing the toll millers, custom millers or poultry shops.

An overview of supply chain for feed is provided in Figure 13.



The table below presents information on the quantities of some critical feed ingredients imported from year 2000 to 2005. The first three feedstuffs listed 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 feed industry in Nigeria.

TABLE 20:
Imports of selected feedstuffs (2000 - 2006) (kg)

| Year | 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 feed produced is based on rations with lysine and methionine inclusion, the total annual feed produced from these feedstuffs will be between 313,000 and 640,000 tonnes on average (see table below).

TABLE 21:
Estimates of poultry feeds produced based on lysine and methionine imports (tonnes)

| Year | Lysine (kg) | Feed (tonnes) | | Methionine (kg) | Feed (tonnes) | |
|----------------|------------------|-----------------------------|-----------------------------|-----------------|--------------------------------|--------------------------------|
| | | 1 kg Lysine to 1 tonne Feed | 2 kg Lysine to 1 tonne Feed | | 1 kg Mthionine to 1 tonne Feed | 2kg Methionine to 1 tonne Feed |
| 2000 | 283,077 | 283,077 | 141,539 | 511,447 | 511,447 | 255,724 |
| 2001 | 550,790 | 550,790 | 275,395 | 670,953 | 670,953 | 335,477 |
| 2002 | 793,328 | 793,328 | 396,664 | 425,722 | 425,722 | 212,861 |
| 2003 | 539,767 | 539,767 | 269,884 | 600,671 | 600,671 | 300,336 |
| 2004 | 849,430 | 849,430 | 424,715 | 721,963 | 721,963 | 360,982 |
| 2005 | 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 20

The total estimated live weight of broiler produced per annum is 138,544,287kg (or 138 544 tonnes). At a feed-meat conversion ratio of 2.2:1, the total feed requirement to support broiler production is 304 797 tonnes. Similarly, 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 1 561 901 tonnes. The total of these two major feed requirements of the poultry sub-sector are conveniently accommodated within the estimated feed in Table 21.

Chapter 5

Breeds

5.1 EXOTIC BREEDS

This information has not yet been sourced.

5.2 LOCAL BREEDS

This information has not yet been sourced.

Chapter 6

Veterinary health, public health, biosecurity measures

6.1 HIGHLY PATHOGENIC AVIAN INFLUENZA

The geographic spread of the most recent Avian Influenza (AI) pandemic started in the latter 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 move across the Mediterranean into Libya, Egypt or other contiguous countries in North Africa. It was therefore rather unexpected that the first reported case of the disease in Africa was from Nigeria. The factors enabling the early diagnosis of AI in Nigeria include the following pre-epidemic activities instituted following the global H5N1 AI alert:

- Preliminary proposal to FGN by a team of subject specialists based in the University of Ibadan (early 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 established 3 committees: Inter-Ministerial Expert Committee on Flu in early 2005; The Health Sector Technical Advisory Committee, Dec 2005; Technical Committee of Experts in Federal Livestock Department, Dec 2005
- The latter two committees - which were primarily concerned with the medical and agricultural sectors respectively - promptly submitted separate preparedness documents to FGN in December, 2005
- The poultry industry and investors under the umbrella of the Poultry Association of Nigeria (PAN), made some attempts to focus on the pre-epidemic stage and became more active when the epidemic was eventually reported
- The print and electronic media provided publicity from all the above mentioned sources

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 in December 2005, the arrival of the epidemic so soon after - through a diagnosis from ABU, Zaria in January 2006 - appeared to have caught the country by surprise and rather unprepared. There was minimal time to study, adopt and procure logistic requirements. The requisite preparedness training of field staff could not be carried out effectively and panic was therefore inevitable in the circumstances. However, with the rather emphatic policy stance of FGN, national and international efforts were speedily mobilized to implement a concerted response programme to replace the initial panic.

Plans were immediately developed 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 7th February 2006.

There was concern amongst all stakeholders regarding the economic implications for poultry production. Small-scale, rural operators were worried by the threat of losing a source of household income; large commercial operators were concerned about the potential loss of their investment capital and employees feared possible redundancies. Consumers gradually reduced their consumption of poultry meat and eggs and opted for fish, beef and other substitutes; this loss in demand impacted on cost, with producers and retailers of poultry products recording a large drop in sales and incomes. The Poultry Association of Nigeria

(PAN) and the Poultry Marketers Association as well as some professional associations like the Nigerian Veterinary Medical Association (NVMA) and the World Poultry Science Association (WPSA,Nig) hosted public awareness-raising seminars and lectures in locations across the country.

The municipality of Jos in Plateau State was one of the places affected by the bird flu epidemic and it recorded subsequent 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 a market commodity as at June 2006. Thus, there was a depletion ranging from 33% to 100 % in sampled farms, about 50 % in feed mill output, 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 22.a:
Impact of HPAI in Jos (production)

| Farms | Layer Poultry Stock | | Feed Mills (tonnes) | |
|-------------------------------------|---------------------|---------|---------------------|---------|
| | Pre-HPAI | Current | Pre-HPAI | Current |
| Agro KaffinHs | 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 22.b:
Impact of HPAI in Jos (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

Response to the AI outbreak

FGN declared a slaughter and eradication policy for the stamping-out of the flu epidemic. Responses for poultry operations focused on awareness-raising campaigns relating to intensified preventive biosecurity; detection and reporting; slaughter/depopulation and disposal and decontamination procedures. Poultry meat handling and kitchen safety precautions were also a key focus. Scientists - especially those in the Universities - called for a multi-lateral and comprehensive surveillance strategy and implementation that would 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.

Vaccination was not adopted as a response. There are arguments for and against the adoption of vaccination for the control of bird flu in Nigeria. The characteristics of the typically small-scale rural poultry flocks demand some special considerations, in terms of dose-package, shelf life or stability, route of application and even the accessibility to small, free-range-flocks.

Trends in AI outbreaks

The 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 the 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 the southeast of Nigeria in March/April. As at May 2006, outbreaks had been reported from 14 states covering 32 LGAs. The spread was initially rapid despite the slaughter/stamp-out programme, but it slowed down significantly in April, which coincided with the start of the hot season in the northern epi-centre. Thereafter, only a 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 commercial farms with improved bio-security 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 outbreak 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.

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 full-scale payback of the costs of the slaughtered birds. This policy generated mixed reactions amongst stakeholders, leading to incomplete compliance by some of them.

International Support

The global importance of AI epidemic is evident in the support which Nigeria received from international bodies. An overview of donor support for tackling the AI epidemic as per July 2006 in Nigeria is given below:

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

Implications of AI for the Rural Poultry Sector and Genetic Base

Although the economic and public health implications of the AI epidemic on the rural poultry sector are yet to be assessed, there are reports of losses in the sector through AI mortality and collateral slaughtering.

One main cause for concern is 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; it is not unusual for rural poultry to enter the abodes of their keepers for food in the day time or for rest at night time. Children are fond of playing with family chickens and market sellers also have very close contact with the birds.

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 the 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 grade flu virus activities in Nigeria's industrial and rural poultry which predate the latest H5N1 epidemic. These and other technical questions deserve empirical consideration and investigations for answers.

It is important to remember that family flocks are integral to the global poultry population and a crucial household resource for the rural population in developing countries. The rural poultry sector therefore deserves a proactive engagement in the management of the massive threat posed by bird flu.

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 and geneticists are looking at the preservation of the un-tapped genetic resources in the germplasm 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 to date there has been little or no sustained effort especially in terms of current and pro-active research in this direction.

6.2 OTHER MAJOR POULTRY DISEASES

For regularly updated information on the status of notifiable and other transboundary poultry diseases, please refer to:

The FAO Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases available at www.fao.org/ag/againfo/programmes/en/empres/home.asp

The OIE World Animal Health Information Database (WAHID) available at www.oie.int

See Sections 3.2 and 3.4.1 for information on poultry diseases in the commercial and rural sectors

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 the predicted period of disease incursion. The risk from horizontal disease spread is high in the typical open-sided poultry housing system in Nigeria. Most integrated and indeed the whole of the commercial poultry sectors 1, 2 and 3 in Nigeria rely on this strategy to reduce disease outbreaks and spread within and between flocks. The examples of preventive medication are the application of coccidiostats and anthelmintics periodically in stock. 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 sector, to prevent 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 abuse by farmers. 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. 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, namely import and NVRI, Vom. 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. In the circumstance, the poultry industry is compelled to supplement through imports. 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 11.

TABLE 23:
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 24:
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-offspring.

6.3 BIOSECURITY MEASURES

This information has not yet been sourced.

Chapter 7

Current policies, legal framework

The Animal Diseases (Control) Decree

The control of all animal diseases in Nigeria is regulated by the rules and laws set out in decree No 10 which was gazetted in February 1988, pages A477 to 501. The decree contains the definitions and rules guiding the import and export 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 main aspects relevant here are as follows:

- The import or export of animals, poultry and their products (including hatching eggs and biologics) is prohibited, except under a permit granted by the Director. The decree provides for manned control and monitoring posts which are listed in a schedule and also 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 are registered annually (fee N50) and managed hygienically with compliance to vaccination programmes.
- It empowers the Minister to make regulations on importation and exportation and the management of any disease outbreak of national economic importance by control or eradication measures.
- At 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, namely:

| | |
|--|---------------------------------------|
| 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 | No 44 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 detailed provisions for compensation with regards to animals slaughtered for disease control purposes. However, the relevance of the provisions for 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.

Technical Overview of the Decree

Given that the decree was established in 1988, it is reasonably comprehensive and detailed. However, it is also clear that many core areas of the decree are no longer relevant to a dynamic sector like livestock and poultry health. The most glaring examples of such lapses include the low definition of size of poultry and hatchery to be registered (250), the penalty of N50 for contraventions and the context and specificity of the list of poultry diseases, for example, Nos 44& 53.

There are many important poultry diseases which have been globally recognised or re-classified since the 1988 decree. For instance, the globally adopted name for Fowl plaque which has superceded the combining 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 term which derived from the early part of the last century. It is therefore clear that a total review and update of Nigeria's animal disease regulations is urgently required. Indeed, the emerging pre-eminence of the poultry sub-sector as a result of the recent Avian Flu epidemic should help focus greater attention on the sub-sector in the new Animal Diseases Edict /Regulations.

Chapter 8

Analysis

8.1 CURRENT STRENGTHS AND WEAKNESSES OF THE POULTRY SECTOR

The key conclusions arising from the study are as follows:

- a) There is no recent well-structured study providing information on the Nigerian poultry sub-sector
- b) The FAO classification of poultry enterprises is not entirely applicable to the Nigerian environment especially as it relates to Sector 4: Backyard or village poultry. Currently the range of poultry being kept at backyard level in Nigeria varies from completely free-range subsistence poultry with a flock size of up to 30 to intensive, housed and totally restricted commercial-oriented poultry with a flock size varying from 50 to 500.
- c) 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.
- d) There appears not to be a clear-cut definition of what constitutes household poultry and flock. The grey areas include the definition of household (man and his one wife, a man and his many wives, or the extended family living together in a compound), type of poultry (exotic versus indigenous) and husbandry/management system (free range and low input; restricted and fed with compounded ration but kept in the backyard)
- e) 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
- f) Commercial poultry in Nigeria is largely private sector driven. The government only provides policy support.
- g) The total value of the poultry sub-sector is very significant.
- h) The contribution of poultry to household food security is very significant if local production is taken as an indicator of consumption.
- i) The contribution of commercial poultry to household food security is far greater than that of subsistence poultry given the different productivities and off take rates.
- j) There has been a decline in poultry products imports in last few years.
- k) The introduction of fast food outlets into the marketing system in recent years has facilitated access to well-processed and better culinary presentations of poultry products thereby increasing the consumption of poultry products.
- l) There is a significant 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.
- m) There is currently no monitoring and certification of poultry meat processing and there are no quality criteria in place.
- n) There are no effective hatchery monitoring and certification protocols in place.
- o) There are signs of active response to and management of the HPAI epidemic in Nigeria but the control options (eradication versus vaccination) need to be re-evaluated.

- p) Considering the numerous often inaccessible foci of rural poultry in Nigeria, special consideration is required for effective control of HPAI in this group of poultry to minimize the implications for the economy and public health.

The following recommendations arise from this review:

- a) A 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, a proper definition of household poultry within the Nigerian environment should be established in order to ensure that whatever is not captured as household poultry is captured as commercial even if it is located in the backyard.
- b) Standard protocols for monitoring and certifying poultry meat processing plants should be established.
- c) Standard protocols for effective hatchery monitoring and certification should be developed and implemented.
- d) The options for the control of HPAI should be re-evaluated to determine which of the two options (eradication and vaccination) will provide more comprehensive and long lasting benefits.

8.2 PROSPECTS OF THE POULTRY SECTOR OVER THE NEXT FIVE YEARS

This information has not yet been sourced.

Annex I

Who is who (contact list)

This information has not yet been sourced.

Annex II

List of major projects – poultry sector

Government support programmes to the poultry sector

Background

Nigeria's poultry industry has its roots 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 the 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 1 million in the mid 1960s to over 40 million by the early parts of the 1980s. All along, the growth of the industry was supported by 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 provided 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 in various sectors - including poultry - rapidly forwards. From this time, the poultry industry started to be self-supporting, viable and attractive to financial institutions. However towards the end of the 1980s, the government introduced policies like the Structural Adjustment Programme (SAP), 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 was dictated by its conspicuous dependence on imported inputs like GPS and PS, grains, feed stuff, drugs, vaccines and others. The new policies placed a ban or restriction on the importation of many of these essential inputs. The devaluation of the national currency also exacerbated 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 had survived by the mid 1990s. The resulting decline in the 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 serious 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 input nature. Indeed, available information claimed that indigenous poultry grew by over 16% in the period.

These negative developments in commercial poultry challenged successive governments from the late 1990s to the present. The governments recognised the need to rejuvenate the poultry industry and redress the situation through policy incentives and other similar programmes. With the intensification of such programmes in recent times, the poultry sector has started to recover. 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.

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 rural and smallholder poultry. Further information on such programmes is given below.

✓ *General livestock policies*

The role of government remains initiating a 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 to best use. This is to be achieved by expanding the resource base or increasing the 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

✓ *Poultry Production 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. The policy strategies are:

- employment of the most modern method in genetic engineering to develop a Nigerian stock
- collaboration between Nigerian research institutions and some well established and experienced companies from developed countries (e.g. Euribrid of Netherlands) in the development of Nigerian Grandparent stock.
- establishment of grandparent 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 due to lack of funds. The following tables show the productivity of the Shika brown layer breed.

Performance of FGN/NAPRI Foundation stock (Pure Breed)

| 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 | - |

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 | - |

Performance 20-40 wks 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 |

Body weight, ages, mortality, feed intake and feed conversion ratios at certain stages of the laying period

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

The 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 constitutes over 60% of the production cost of the livestock industry, Government has continued to support research into alternative local feed formulations.

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.

✓ *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.

The methods of implementing these price interventions are limited to tariff and non-tariff barriers, input subsidies and exchange control as well as Value Added Taxes (VAT). As part of the policy thrust for the 2002 fiscal year, the 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, tariffs for poultry feed grade vitamins such as L-Lysine, antibiotics etc were reduced from 15% to 5% and day old chicks maintained at 5%.

Some non-price planning strategies and instruments undertaken during the period under review include the restructuring of the Agricultural Bank and the reduction of the interest rate on credit to less than 10%. Some anti-dumping measures were undertaken which included the restriction in the importation of poultry products over land borders.

✓ *Policies relating to consumption*

There are no managed consumer prices as prevailing prices of livestock and meat/dairy products are determined through market forces. Livestock products are not subsidised. The Government plans to encourage the consumption of some products through the introduction of the School Feeding Programme whereby milk and eggs are served in primary and secondary schools at break time free of charge or at a subsidized rate. Pilot projects have already been initiated in some States.

✓ *International Trade Policies*

The objectives of the government's trade policies are to promote exports both as a way of diversifying the country's export and as a means of boosting the growth and development of the sector. The Government export policy is to minimize the administrative controls of external trade through trade liberalization and the 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.

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 especially against 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. 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 rural chicken producers. The total estimate for the programme is two hundred millions Naira (N200M). This covers the cost of disease control materials and inputs as well as other logistics (vaccines, drugs, equipment, mobility, field allowances, etc).

The Millennium Development Goal Project of the Federal Ministry of Agriculture

This is a forward-looking and ambitious programme, which exemplifies the focus of government policy on the poultry sector. It recognises that the poultry industry is currently private sector led and has the highest potential for achieving the reduction of hunger and poverty

The key points of the millennium development plan is captured below.

Poultry Production

✓ *Increase in egg and poultry meat production*

- Broiler production: (0-8 wks) % feed cost / total production 57.04%
- Cockerel production: (0 – 6) weeks) 45.30%
- Starter Pullets (0-8 wks) 50.2 %
- Point of Lay production: (9-20wks): 68%
- Commercial Eggs Production: (21 – 72 wks) 72%

Poultry Development

- Syndication of loanable funds at interest rates not exceeding 9% through NACRDB for poultry farmers
- 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
- Rehabilitation of abandoned hatcheries and establishment of new ones

Presidential Initiative on Livestock

This represents the initiative of FGN to re-activate the huge but rather dormant national livestock sector of Nigerian agriculture. The policy and programme are comprehensive and cover all livestock types. A Committee on Livestock was established which made a number of recommendations on the way forward. The objectives relating to the poultry sub-sector are given below:

- 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 subsequently recommended programmes in these areas to assist in achieving the objectives:

- a) Feed and Nutrition
- b) Animal Breeding and Genetic Improvement
 - establishment of cattle, sheep, goat and pig Multiplication Centres
 - establishment of Poultry Production Units and micro livestock or meat from non-conventional sources
- c) 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
- d) Livestock Processing and marketing
 - Standardisation of the marketing system
 - Development of an export market for livestock and livestock products
 - Poultry products processing programme
- e) 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
- f) Grazing Reserve and stock routes
 - Accelerated Development of Stock Routes and Grazing Corridors
- g) Livestock Extension Services
 - Draw up extension priorities at local level, as livestock production needs may not be predictable
 - Train animal health workers in Information and Communication Technology (ICT) and use them for extension in a targeted way
- h) Export of Livestock Products
 - Vitamins, pre-mixes and concentrates
 - Livestock vaccines and veterinary drugs
 - Value added livestock products (eg eggs and poultry products)

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.

Implementation so far

A total of N 100 million was appropriated for the Presidential Initiatives on Livestock in 2004. This represents less than 2.5% of the expected N2.3 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 N44.0 million was released for the first and second quarters of 2005 and was utilized for:

- Rehabilitation of 4 existing livestock breeding centres;
- Re-stocking of 4 breeding centres with improved breeds (60 animals);
- Provision of infrastructure such as boreholes and watering facilities in grazing reserves in the North West, North East, and North Central Zones;
- Demarcation of 116 km of stock routes in the North West axis of the transhumance stock route to reduce pastoralist/crop farmer clashes.

Other activities programmed for implementation include:

- Procurement of CBPP vaccines, syringes and needles;
- Development of grazing reserves and stock routes;

- Procurement of supplementary feeds;
- Refurbishing and rehabilitation of eleven (11) Breeding Centres;
- Procurement of DOCs for Family Poultry Programme;
- Procurement of equipment for livestock extension services;
- Livestock processing and marketing inputs;
- vaccination of 10 million heads of cattle in the North;
- 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;
- surveillance of crop and livestock pests in 10 Frontline States;
- 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;
- Development of 17,032 km of transhumance stock routes and grazing corridors;
- 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, which covers both industrial and rural poultry, its implementation has been problematic, not least through poor funding. The progress so far demonstrates that although the support and policy initiatives are sound, the problem is in the funding and implementation of such policies.

Annex III

Bibliography

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Orajaka, L. J. E., Okoye, J. O. A. and Oboegbulem, S. I.** (2002) Seroepidemiological Survey of Mycoplasmal Infections in Native and Exotic Chickens in Nsukka District of South-East Nigeria. *Journal of Sustainable Agriculture and the Environment.* 4 (1). 77 – 82.
- 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.
- 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
- 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
- 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.
- 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
- Agbato, A.O.** 2005. Towards antibiotic free poultry farming. In: Book of proceedings WIRP. Ahmadu Bello University, Zaria, Nigeria, pp.134-146
- 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'elevage et de medicine veterinaire des pays tropicaux.* 54 (3-4), 213-216.
- 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
- 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
- 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.

- 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
- 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
- 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.
- 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.
- 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>.
- Nwanta, J.A.; Umoh, J.U.; Abdu, P.A.; Ajogi, I. and Alli-Balogun, J.K.** (2006). Management of losses and Newcastle disease in Kaduna State, Nigeria. Nigerian Journal of Animal Production. 33 (2): 274 - 285.
- 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 Vaccine in commercial chickens via eye-drop, drinking water and feed. Bull. Anim. Hlth. Prod. Afr. (accepted for publication and in press).
- Oloyo, R.A.** (2002). Niacin requirement of broilers fed maize – palm kernel meal based diets. Nigerian Journal of Animal Production 29(1), 27-33.
- 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.
- 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.
- 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).
- 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.
- Ambali, A.G., El-Yuguda, A.D., Atiku, S.A. and Usman, B.A.** (2004). Effects of Ascorbic Acid and Honey on The Immune Response of Chickens to Vaccination with NDV-V4 Vaccine. Agrosatellite J. 1: 2-7.
- 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.
- 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.
- Biu, A.A. and Haddabi, I.** (2005). An Investigation of Tetrameres Infection Among Local Chickens in Maiduguri. Nig. Vet. J. 26(1): 41-46.
- 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).
- 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.
- 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).
- 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.

- 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.*
- 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.
- 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.
- 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.
- 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.
- 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.
- Abdu, P. A., A. M. Wakawa, and L. Sa'idu,** 2005. Avian influenza: A review. *Nigerian Veterinary Journal*, 26(1):34-43.
- Abdu, P. A., A. M. Wakawa, and L. Sa'idu,** 2005. Avian influenza: A review. *Nigerian Veterinary Journal*, 26(1):34-43.
- Abdu, P. A., L. Sa'idu, and M. Wakawa,** 2003. *Manual of Poultry Diseases.* (ABU Press PLC), 50 pp (Submitted).
- 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.
- 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, PIWEP14-18 August 2000, Kaduna, Edited by Gefu, J. O. Abdu, P. A. and Alawa, C. B. Pp.56-64.
- 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.
- 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.
- Abdu, P.A and L. Sa'idu,** 2001. Veterinarians and poultry farmers' relationship. *Agvet International*, 2(1): 13-14.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.

- 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.
- 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.
- Abdu, P.A., L Sa'idu, and S. J. Rwuaan**, 2002. Some reproductive abnormalities in domestic fowls. *Nigerian Journal of Animal Production*, 29(1):94-101.
- 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.
- 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 Purepureus 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.
- 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.
- Abeke, F.O., S.O. Ogundipe, A.A. Sekoni, I.I. Dafwang, G.S. Bawa, I.A., Adeyinka, O.O. Oni and B.I., Nwagu** 2003. Response of growing pullets to dietary levels of Lablab Purepureus beans. In: Proceedings of 28th Annual Conference of the Nigerian society for Animal Production (NSAP) held at Usman Danfodio University, Sokoto. From 21st--25 March, 2004
- 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 Olorede) Pp. 241-243.
- 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.
- 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.
- 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.
- 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.
- Abubakar A., A.A.Sekoni, H.M. Tukur and W.A. Hassan**, 2004. Impact of yeast supplementation on the growth performance of pullet chicks fed diet with high level of rice bran. In: proceedings of 28th Annual Conference of the Nigerian society for Animal Production (NSAP) held at Usman Danfodio University, Sokoto. From 21st – 25 March, 2004. pp. 265-267.
- 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.
- Abubakar, A., Tukur, H.M., Sekoni, A.A. and Akin, W.A.** (????) Rice bran and yeast in the diets of growing pullets in semi-arid environment. (incomplete ref.)
- 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)

- 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: Fanim, 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.
- 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.
- 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.
- 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.
- 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.
- 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).
- 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 Chicks in A Semi-Arid Environment of Nigeria. *Sabondale J. Technical Education.* 4: 75-81.
- 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.
- 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.
- Ady, 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.
- Adebayo, I. A.** (2004): Application of Heterologous Erythrocyte Indicator Systems in the Differentiation of Vaccinal and Natural Newcastle Disease Induced Antibodies. *Int. Jour. Poult. Sci.* 3 (6): 411-414
- 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.
- 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
- 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
- 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.
- Adedapo, A.A., J.O. Olopade, A.B. Saba, and O.A. Dina,** 2004. Effect of corticosteroid administration on the infectivity of Trypanosome Bruce (8/18) in Nigeria domestic chickens (*Gallus Domesticus*). *Nigeria Journal of Animal production,* 33 (1) 140-144.
- 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.*
- 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.
- 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.

- 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
- 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.
- 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*
- 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.
- 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
- Ademola, S.G., G.O.Farinu, and A.O. Ajayi-Obe**, 2004. Effects of *Allium Sativum* and *Zingiber 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.*
- Adene, D. F.** (2000). Action Plan – For poultry Animal Health In Pilot Scale Study Under FGN/FAO/TCP/NIR/7822. 81 pgs.
- 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.*
- 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.*
- Adene, D. F.** (2006). Avian Influenza: The Trans-continental Plague. (WPSAS-Ghana, Poultry Seminar) Accra, 11 -14 April, 2006.
- Adene, D. F.** (2006). Avian Influenza: The Trans-continental Plague. (WPSAS-Ghana, Poultry Seminar) Accra, 11 -14 April, 2006.
- 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.*
- 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.*
- Adene, D. F.,** (2000). Micro ingredient and Premixes in Poultry health and production. *Bio-Organics Nutrients System Ltd; Ibadan. Nigeria. 12 pgs.*
- Adene, D. F.,** (2000). Micro ingredient and Premixes in Poultry health and production. *Bio-Organics Nutrients System Ltd; Ibadan.,Nigeria. 12 pgs.*
- 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.
- 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.*
- 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.*
- 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.*
- 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 *Proc. 38th. Congress Nig. Med. Ass, Badagry; 17-20*
- Adene, D.F.** (2006). A panoramic View of Avian Influenza in Nigeria. *Awareness Forum – Senate Committee, Ahmadu Bello University, Zaria, Nigeria.. 14 March, 2006*
- Adene, D.F.,** (2006). A panoramic View of Avian Influenza in Nigeria. *Awareness Forum – Senate Committee, Ahmadu Bello Unveristy, Zaria, Nigeria.. 14 March, 2006*
- 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.*
- Adene, D.F.,** 2005. Application of costs in disease evaluation to risk management in poultry. In: *Book of Proceedings WIRP. Ahmadu Bello University, Zaria, Nigeria, pp.117-133.*
- 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.*
- Adene, D.F.,** (2006). Developments on Bird Flu situation in Nigeria: Back-Tracing and Projecting. *WPSA (Nigeria) Poultry Fair, Lagos, Nigeria. 20 -22 Feb, 20006.*

- Adene, D.F.**, (2006). Developments on Bird Flu situation in Nigeria: Back-Tracing and Projecting. WPSA (Nigeria) Poultry Fair, Lagos, Nigeria. 20 -22 Feb, 20006.
- 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.
- 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).
- 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).
- 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.
- 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.
- 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.
- 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.
- 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.
- Adene,D.F.**, (2005).Improved and tools-independent disease diagnosis in Poulltry. Proc. Worskshop on Poultry Health and Production Efficiency. Ahmadu Bello University, Zaria Nigeria, Nov., 2005. Pg10 -21.
- 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.
- Adeniji, C.A.**, (2004). Performance and carcass characteristics of broiler chicken fed high fibre sunflower seed cake diets. Nigerian Journal of Animal Production 31(2), 174-181.
- 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.
- 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
- Adeniji, C.A.**, 2004. Performance and carcass characteristics of broiler chicken fed high fibre sunflower seed cake diet. Nigeria Journal of Animal production, 31 (2) 174-181.
- 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.
- 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.
- 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.
- 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.
- 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)
- 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.
- 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.
- Adeyemi, O.A. J.O. Atteh, and Ibiyemi**, 2001. Apparent nitrogen corrected and true metabolizable energy of processed theretia oil for broiler finisher birds. Nigerian Journal of Animal Production, 28(1) 56-60.

- 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.
- 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.
- 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.
- 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.
- Aduguwa, O.O., A. O. Fanimo 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.
- Adwumi, 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.
- Afolayan, G.G. Oloredo, B.R., Uko, O.J., Junaidu, A.U. and Fanimo, A.O.**, (2002). The replacement value of maize bran for maize in broilers finisher diets. *Proc.7th Ann. Conf. Sci. Assoc. Nig. (ASAN), Univ. of Agric., Abeokuta*
- 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.
- 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.
- 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.
- 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.
- 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.
- Ahamed T.S. and B.R. Oloredo**, (2003). Effect of feeding varying levels
- 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.*
- 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.
- Aiki-Raji, C.O., Oladele, O.A. and Adene, D.F.**, (2003). Swollen wattles in chickens: A case study. *Nigerian Veterinary Journal*. Vol 24(3), 19-22.
- 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.
- 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.
- 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.
- Akinmutimi, A.H., S.F. Abasiekong 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.
- 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.*
- 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.*
- 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.
- 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.

- 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.
- 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.
- 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.
- Alawa, C.B.I., J.O. Gefu, N.P. Chiezey, P.A. Abdu, S.O. Magaji, L.O. Eduvie, and I.O. Adeyinka**, 2000. Screening of Veronica amygdalina for anthelmintic properties, PIWEP14-18 August 2000, Kaduna, Edited by Gefu, J. O. Abdu, P. A. and Alawa, C. B. Pp.49-55.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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
- Asaniyan, E.K and E.A.O. Laseined**, 2005. Comparative studies of the performance of broiler chickens fed different commercial diets. 30: 121-126.
- 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.

- Awojobi, H.A. and O. O. Meshioye**, (2001). A comparison of wet mash and dry mash feeding for broiler finisher during wet season in the tropics. *Nigerian Journal of Animal Production* 28(2) 2001:143-146.
- 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.
- 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.
- 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.
- Ayanwale, A.B. and J.O. Ajetomobi, (short communication)**, 2001. The role of household composition in egg consumption in the Obafemi Awolowo University. *Nigerian Journal of Animal Production*, 28(1)98-102.
- 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.
- Ayanwale, B.A.**, (2006). Growth and carcass characteristics of broilers fed alkali processed soyabeans. *Nigerian Journal of Animal Production*. 33(1), 40-44.
- Ayanwale, B.A. and Gado, Y.**, (2001). Effect of commercial diets on egg quality characteristics. *Nigerian Journal of Animal Production* 28(2), 202-206.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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 trials using locally available feed stuff as vaccine vehicles. In: *proceedings of the 41st congress of the NVMA pp.*, 85-86.
- 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.
- 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.
- 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.
- 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.
- 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 (MultivaxR). Abstract, 42nd Annual Congress, Nigerian Veterinary Medical Association, Maiduguri, Borno State, Nigeria, November 14-18, 2005.
- Baba, S.S.**, A.D El-Yuguda, and U.M. Dokas, 2004. The effects of Newcastle disease and infectious bursal disease 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.
- 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.
- 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.
- Babangida, S. and Ubosi, C.O.**, (2005). Effects of Varying Dietary Protein Levels on The Performance of Laying Japanese Quail (*Coturnix coturnix japonica*) in a Semi-Arid Environment. J. Animal Production 33(1):45-52.
- 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.
- 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.
- Bale, O.O.J., A.A. Sekoni, and C.N. Kwanashe**, 2002. Nigerian Journal of Animal Production, 29(1)102-112.
- 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.
- Bale, O.O.J., B.I. Nwangu, B.Y. Abubakar**, 2000. Semen Bacteria Flora of Rhode Island Red Breeder Cocks in IAbubakar, 2000. ety of Vet.ambolu, S.A. Ojo, 2004. Journal of Veterinary Medicine. Zaria, Kaduna State Nigeria. Journal of Animal Production 27: 16-18.
- 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.
- 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.
- Bashar, Y.A and A. Abubakar**, 2001. Performance of broiler birds fed pumpkin seed meal. Nigeria society of Animal Production, 26:283-285.
- 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.
- 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.
- 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.
- Biu, A.A. and I. Haddabi**, 2005. An investigation of Tetramers infection among local chickens in Maiduguri, Nigeria Veterinary Journal, 26(1) 44-46.

- 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.
- Biu, A.A. and Hassan, I.**, (2001). Pigeon Coccidiosis: A Prevalence study in Maiduguri. *Res. J. of Sci.* 7(1&2): 55-59.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Carew, S.N., O.I.A. Oluremi, and E.P. Wambutla**, 2005. The Quality of commercial poultry feeds in Nigeria. *Nigeria Veterinary*
- 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 production 25: 299-302.
- 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.
- Chah, K.F, Gorge L.N, and Oboegbulem, S.I.**, (2002) Antimicrobial resistance 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Chikwendu, D.O. I.I. Dafwang, E.I. Annatte, Iwuanyanw, I.E.J. and A.O.K. Adesehinwa**, 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.

- 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.
- 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).
- 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.
- 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
- 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.
- Dafwang, I.I. A.I. Annatte, E.I. Ikani, D.O. Chikwendu, I.E.J. Iwuanyanwu and A.O.K. Adesehinwa**, 2001a. 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.
- 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.
- Dafwang, I.I., A.I. Annatte, I.E. Ikani, D.O. Chikwandu, I.E.J. Iwuanyanwu, A.O.K. Adesehinwa**, 2001. Sources of Information and use of Non-Conventional Feedstuffs by Poultry and pig Farmers. In: *Proceedings of the 28th Annual Conference of the Nigerian Society of Animal Production*, Pp 224-227.
- 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.
- 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.
- 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.
- 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.
- 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.
- Dairo, F.A.S.**, 2005. Performance and haematological values of laying hens fed fermented copra meal. *Nigeria Society of Animal Production*, 30: 190-192.
- Diara, S.S., Kwari, I.D., Ubsi, 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.
- Dipealu, M.A., A.J. Adebayo, and M.O. Oke**, 2004. Residues of streptomycin antibiotic in commercial Layers in Abeokuta and Ibadan metropol. *Nigeria Journal of Animal production*, 3 (1) 130-134.
- 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.
- 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.
- 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.
- Dipeolu, 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 Production* 31(1) 2004:130-134.

- 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.
- 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.
- Durotoye, L.A., M.O. Fadaoro, and A.K. Avwemorue**, 2000. Diurnal variation in blood parameters in the chicken in the hot tropical climate. *African journal of biomedical research*, 3(3): 143-147.
- 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.
- 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.
- 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.
- 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.
- Ebenebe, C.I.**, (2001). Alleviation of rural poverty, in Nigeria through minilivestock Production. *Nigerian Society of Animal Production*, 26:144-146.
- 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.
- Egbewande O.O and B.R. Olorede and C. Onwuchekwa**, (2004).
- Egbewande O.O. and B.R. Olorede**, (2003). Substitution of ground nut cake with mistletoe (*Loranthus bengwensis*) leaf meal in broiler diets. *Proc. 8th*
- 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.
- EI-Yuguda, A.D. and Baba, S.S.**, (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.
- EI-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.
- EI-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.
- EI-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.
- EI-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.
- EI-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.
- EI-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.
- EI-Yuguda, A.D., A.O. Wasiu, J.O. Atteh and S.S. Baba**, 2003. Haemagglutination Studies on Egg Drop Syndrome 1976 virus at different Temperatures Using Avian and Mammalian Erythrocytes. *Sokoto Journal of Veterinary Sciences* Volume 5, Pp. 13-15.
- 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.
- 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.

- 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.
- Emikpe B.O., O.G. Ohore, D.O. Oluwayelu O.A. Oladale, M.A.Ockiya and S.O. Eniola**, 2003. Sero-prevalence of antibodies to infections bronchitis Virus in Nigeria indigenous chickens in Ibadan. *Nigeria Veterinary Journal*, 24(3) 9-12.
- 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*.
- 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.
- 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.
- 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.
- 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.
- 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.
- Esonu, 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.
- 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.
- Esonu, B.O.**, 2001. Comparative evaluation of raw and urea/toasted velvet bean (*Macuna pruriens*) for broiler chicks. *Nigerian Journal of Animal Production*, 28(1) 40-44.
- 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.
- 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.
- Esuga, P.M.**, 2001. Private Sector participation in Animal Production for Poverty Alleviation. *Nigeria Society of Animal Production*, 26: Kaduna.
- 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.
- 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.
- Etuk, E.B. and Udedibe, A.B.I.**, (2006). Effect of cooked pigeon pea seed meal on the performance, dressed and organ weight characteristics of broilers. *Nigerian Journal of Animal Production*. 33(3), 16-20.
- 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.
- 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.
- Ezeibe, M.C.O.**, (2001). Haemagglutination Technique for detection of Newcastle disease virus in live chicken. *Nig. Vet. J.* 22 (1): 3-7.
- 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.
- Ezekwe, A.G and Machebe, N.**, (2004). Ejaculate characteristics of two genotypes of Nigerian local cocks. *Proc. Annul. Conf. Anim. Sci. asso. Nig.*
- 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.*

- Ezekwe, A.G., I.J. Udozor, and C.O. Osita**, 2003. Effects of quantitative feed restriction on the seven quality of Nigeria Local Cocks. *Nigerian Journal; of Animal Production*, 20(1): 127-132.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Faniyi, G.F. A.M. Durojaiye, A.A. Adeleyte, 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.
- 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.
- 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.
- 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.
- Fatih, 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.
- George, B. D. J., I. K. Ndams, and P. A. Abdu**, 2004. Concurrent outbreaks of suspected duck virus enteritis in domesticated muscovy ducks *Cairina muschata* (Anatidae: Anseriformes) in and around Zaria and a prospect of control using ethnoveterinary methods. *Nigerian Journal of Scientific Research*, 4(2):1-6.
- 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.
- 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.
- 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.
- 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.
- 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
- 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.
- Haruna, E.S., D. F. Adene and V. J. Gerrit**, (2003). Detection of Infectious bursal disease virus in naturally infected chickens in Nigeria by the reverse transcriptase polymerase chain reaction (RT-PCR). *Nig. Vet. Journal* 24. 1 – 9.

- 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.
- 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.
- 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.
- 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.
- 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.
- Ibiyo, L.M.O., and J.O. Atteh**, 2005. Response of starter broilers to diets containing graded level of rice bran with or without palm oil. 32(1)39-45.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Igwebuike,J.U., Mubi,A.A. and Gwoza,U.Y.**, (2001). Comparative Performance of Replacemnt Pullets Fed Three Commercial Growers Diet. *Sabondale J. Tech. Edu.* 4:104-109.
- Iheukwumera, 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.
- 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.

- Ikani, E.I., I.I. Dafwang, D.O. Chikwendu, A.O.K. Adesehinwa, 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.
- Ikani, E.I., I.I. Dafwang, D.O. Chikwendu, A.O.K. Adesehinwe, A.I. Annate, and I.E.J. Iwuanyawu**, 2001. Socio-economic characteristics of and sources of feeds for poultry and pig farmers in Nigeria. Nigeria society of Animal Production., 26: 250-253.
- 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.
- Isidahomen, E.C., Kwari, I.D. and Igwebuikwe, 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).
- 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.
- 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.
- 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.
- Iyayi, E.A. and D.O. Okhankhuele**, (2002). Casava leaf meal and exogenous enzymes as supplements in broiler finisher diets. Tropical Veterinarian, 20(3), 172-180.
- 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.
- 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).
- 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.
- Iyayi, E.A., H. Kluth and M. Rodehutscord**, (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).
- Iyayi, E.A., H. Kluth and M. Rodehutscord**, (2006). Effect of thermal processing on antinutrients and prececal crude protein digestibility in broilers of four tropical crop seeds. International Journal of Food Science and Technology. Accepted (July, 2006).
- Iyayi, E.A., H. Kluth and M. Rodehutscord**, (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).
- 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.
- Jegade, 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.
- 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.
- 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.
- 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.
- 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.

- 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).
- Kwaga, J. K. P., L. B. Tekdek, L. Odama E. 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.
- Kwari, I.D. and Igwebuike, 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.
- Kwari, I.D., Diara, S.S. and Igwebuike, J.U.**,(2003). Effects of Replacing Groundnut Cake with Full-Fat Soyabean on the Performance of Laying Hens. *Nig. J. Exptl. Appl. Bio.* 4(2):247-250.
- Kwari, I.D., Igwebuike, 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-Saharan 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.
- Kwari, I.D., Igwebuike, 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.
- Kwari, I.D., Igwebuike, J.U., Bello, N., Rabo, S.T. and Birma, M.**, (2004). Replacement of Groundnut Cake with Surrrel (*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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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 ??
- 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.
- 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.
- 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' elevation et de Medecine Veterinaire des Pays Tropicaux*, 57(1-2):35-39.
- Mani, A. U. and B.A. Usman.**, 2002. 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. In: PCNVMA, pp. 78-83.
- 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.
- 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.

- 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.
- 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.
- Mbanasor, J.A.**, 2002. Resources use pattern among poultry enterprises in Abia state. *Nigerian Journal of Animal Production*, 29(1):64-70.
- 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.
- 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.
- 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.
- Mubi, A., Igwebuikwe, 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.
- Muhamedm, K., L. Sa'idu and A. Sekoni**, 2001. Colibacillosis in a flock of intensively managed turkeys in Shika-A case Report. *Sokoto Journal of Veterinary Science.* 3(2): 50-51.
- 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.
- 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.
- 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.*
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Nwanta, J.A., E.C. Okolocha and J.K. Alli-Balogun**, 2003. Poultry Production in Kaduna state Nigeria Constraints and Prospects. *Sokoto Journal of Veterinary Sciences*, 4(2).
- 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 (NDV4HR) in Kaduna State, Nigeria. *Nigerian Journal of Animal Production Research* (Accepted).
- 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.
- 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*.

- 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.
- Nwanta, J.A., Umoh, J.U., Abdu, P.A., Ajogi, I. and Ali-Balogun, J.K.**, (2006). Management of losses and Newcastle disease in rural poultry in Kaduna State, Nigeria. *Nigerian Journal of Animal Production*. 33(2). 274-285.
- 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.
- Nwata, J.N., B. Alli, E.C. Okolocha**, 2002. Poultry Production in Kaduna State: Problems and Prospects. *Journal of Veterinary Science* Vol. 4 No 2 Pp. 12-15.
- 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.
- 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.
- 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.
- Obikaonu, H.O. and Udedibie, A.B.I.**, (2004). Performance of growing pigs and finisher broilers housed together. *Nigerian Journal of Animal Production* 31(1), 40-44.
- Oduguwa, O.O. A.O. Fanim, 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.
- Oduguwa, O.O., A. O. Fanim 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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 Fanim, A. O. Peters, S. O. Idowu, S. A. Ola, S. L. and Sonaiya, E. B. Otta, Feb. 20-25th, 2005. Pp. 91-94.
- 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).

- Ogbe, A.O., C.A.O. Adeyefa, R.A. Joshua, and A.A. Owoade**, 2003. Effects of Different handling Temperatures on the immunogenicity of infections Bursal Diseases Vaccines. *Nigeria Veterinary Journal*, 24(3).
- 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
- 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.
- Ogbonna, J.U., F.I. Ogundola, and A.O. Oredein**, (Short communication), 2001. Effect of wet feed on cockerel chicken Performance. *Nigerian Journal of Animal Production*, 28(1)52-55.
- Ogbonna, J.U., K.J. McCracken, J. Lilley, and A. McAlloster**, 2001. Effects of enzyme supplementation of cassava root meal based chick diets on intestinal viscosity. *Nigerian Society of Animal Production*, 26: 271-273.
- Ogundipe, S.O. and S.A. Sani**, 2002. Economics of Poultry Production in Nigeria. In: J.O. Gefu, I.A. Adeyinka 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.
- 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.
- 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.
- 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.
- Ojewola, E. N. Nwachukwu, S. F. Abasiokong, A. H. Akinmutimi and O. A. Oluwafisayo**, (2004). Bioefficacy and economics of Ronozyme™ P as a substitute for bone meal in turkey poult ration. *Nigerian Journal of Animal Production* 31(2), 161-166.
- 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.
- Ojewola, G.S., E.N. Nwachuku, S.F. Abasiokong, A.H. Akinmutimi, and O.A. Oluwafisayo**, (2004). Bioefficacy and economic of Ronozyme TmP as a substitute for bone meal in turkey poultry ration.
- 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.
- 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
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.*
- 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.
- 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.

- 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.
- 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.
- 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.
- Okoye, F.C.**, 2001. Replacement of cassava peel leaf meal for maize as energy source in diet of broilers finishers. *Nigerian Society of Animal Production*, 26: 271-273.
- 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.
- 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.
- 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.
- 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, Rauischholzhausen Germany.* 16th – 20th June 2001. 483 – 488.
- Okoye, J. O.A. and W.S.C. Ezema.**, 2005. Infectious bursal disease: A major disease problem of the Nigerian Poultry. *Vom Journal of Veterinary Science*, 1:56-62.
- 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.
- 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.* Rauischhoulzhausen, Germany, pp.366-383.
- 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.
- Okoye, J.O.A., A.O. Agbu, C.N.Chinewe,, G.O.N. Echeonwu**, 2000. Pathological Characterization in Chickens of a Velogenic Newcastle Disease virus isolated from guinea fowl. *Rev Elev. Med.Vet pays Trop.* 53: 325-330.
- 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.
- 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.
- 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.
- Okwor, E.C. and K. F. Chah**, 2005. Recurring outbreaks of fowl pox in a poultry farm in Msukka, southeast Nigeria society of Animal production, 30:117-119.
- 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.
- 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.

- Oladale, O.A, B.O. Emikkpe, O.O. Oluwayelu, and O.G. Olora**, 2004. Comparison of Agal Gel Precipitation Test (AGPI) and Enzyme Linked Immunosorbent Assay (ELISA) in the Detection of infectious Bursal Diseases Virus (IBDV) Antibody in village chickens in Oyo State, Nigeria. *Nigerian Veterinary Journal* 25 (1), 26-29.
- 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.
- 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.
- 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.
- 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.
- Oladele, O.A.**, (2005). Hatchery-related bacterial diseases: The scourge of salmonellosis 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.
- Oladele, O.A.**, (2005). Salmonellosis 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.
- 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).
- 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.
- 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.
- 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.
- 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.
- 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.
- Oladele, S.B., J.O. Ayo, K.A.N. Esievo, and S.O. Ogundipe**, 2001. Effect of Season and Sex on Packed Cell Volume, Haemoglobin and total Protein of Indigenous Pigeons in Zaria, Nigeria, *Veterinarski Arch*, 77:277-286.
- 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.
- Oladele, S.B., J.O. Ayo, K.A.N. Esievo, S.O. Ogundipe**, 2001. Seasonal and sex variations in packed cell volume, Haemoglobin and total protein of indigenous ducks in Zaria, Nigeria. *Journal of pure and Applied Science*, 1(1): 84-88.
- 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.
- 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.
- 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

- 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.
- 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.
- Oledele, 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.
- Olorede B.R. and A.F. Ajayi**, (2005). Replacement of groundnut cake and maize with *Falderbia Albida* (GAO) in the diets of broiler.
- Olorede B.R. and A.J. Igenozu**, (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 ??.
- Olorede 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.
- Olorede 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 ??
- Olorede B.R.; and Longe, O.G.**, (2000). Growth, Nutrient retention, haematology and serum chemistry of broiler chickens fed a high.
- Olorede B.R.; Y. Saidu; I.M. Abdu and O.A. Akinloye**, (2002). Growth.
- 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.
- Olorede, 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.
- 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.
- Olorede, B.R.; and Longe, O.G.**, (2000). Effect of replacing palm kernel cake.
- 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.
- 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.
- Oloyo, R.A.**, 2002. Niacin requirement of broilers fed maize-palm kernel based diet. *Nigerian Journal of Animal Production*, 29(1)27-33.
- 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.
- 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.
- 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.
- Oluremi, 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.
- 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.
- 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. *Billetin of Tropical Animal Health and production in Africa* 53 (4), 274-276.
- 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.
- 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.

- 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.
- 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.
- 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.
- Omeke, B.C.O., P.A. Nnadi, and W.S. Ezema**, 2003. Evaluation of Fismal Protein supplementation to commercial Feeds for Egg Lay and Quality in warm Tropical Region *Nigeria Veterinary Journal*, 24 (2) 27-33.
- 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).
- Oni, A.O.O., Dim, N.I., Abubakar, B.Y. and Asiribo, O.E.**, (2001) Egg production curve of rhode island red chickens. *Nigerian Journal of Animal Production* 28(1), 78-83.
- Oni, O.O., Abubakar, B.Y., Dim, N.I., Asiribo, O.E. and Adeyinka, I.A.**, (2001). Predictive ability of egg production models. *Nigerian Journal of Animal Production* 28(1), 84-88.
- Oni, O.O., B.Y. Aburbakar, N.I. Dim, E.O. Asinibo, and I.A. Adeyinka**, 2001. Predictive Ability of Egg Production Model. *Journal of Animal Production* 28(1): 84-88.
- 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.
- 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.
- Onibi, G.E.**, 2001. The effect of retail conditions on consumers' preference for turkey meat. *Nigerian Society of Animal Production*, 26:95-98.
- Onibi, G.Z.**, 2005. Effect of dietary oils and vitamin E. supplementation on meat Quality of broilers chickens. *Nigeria society of Animal production*, 30:149-152.
- Onifade, A.A., Odunsi, A.A., Adebisi, Q.A., Abubakar, A., Enowebot, A.E., Muma, E. and Akinsoyounu, 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.
- Onimisi, P.A., I.I. Dafwang, and J.J. Omage**, 2006a. Growth Performance and Carcass Characteristics of Broiler Finisher fed Graded Level of Ginger Waste Meal. In: *Application of Appropriate 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 332-336.
- 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.
- 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.
- Onu, J.E. and N. Ndu**, 2003. Comparative Morphometric study if the Testes of Domestic Fowl (*Gaccus Gaccus Domesticus*), Domestic Duck (*Anas platyrnchos*) and Domestic croose (*Anser Anser*). *Nigeria Veterinary Journal*24 (3) 1-8.
- 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.
- 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.
- Onyimonyi. A.E. and Okeke, G.C.**, (2000). Protein and energy requirements of the Japanese quail (*cortunix cortunix japonica*) in the humid tropics. *Journal of Agriculture, Technology and Education*, 5 (1x2); 35-37.
- Opara, C.I and T.N. Kamalu**, 2005. Selenium supplementation of poultry feed reduces morbidity and mortality of chickens infected with infectious burusal disease. *Nigeria Society of Animal Production*, 30: 60-62.
- 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.

- Oruseibio, 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.
- Oruseibio, S.M. and P.B. Omu**, 2000. The effects of lysine supplementation of commercial broiler feed on the performance of broilers. Book of Proceedings of the 25th Annual Conference of the Nigeria society for Animal production, March 19-23, 2000, held at Umudike. Pp. 117-119.
- Oruseibio, 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.
- 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.
- 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.
- 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.
- 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)
- 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.
- 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.
- Otchere, E.O., A.T.Adeoye, J.O.Gedfu, and A. A. Adewuyi**, (1990). Preliminary observations on Village Poultry Production, 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.
- Otokunfor, 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.
- Owoade, A.A., J.A. Adeniyo. 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.
- 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.
- Owosibo A.O.; O.G. Longe; O. Alatise; A. Akinade and B. R. Oloredo**, (2003). Effect of pelleting sheabutter cake based diet fed to broilers on
- Oyedeji, G.O.**, 2001. Private Sector Participation in Animal Production for Poverty Alleviation. Nigeria Society of Animal Production, 26. Lagos.
- 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.
- 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.
- 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.
- 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.
- Oyekunle, M.A. and M.O Owonikoko**, 2002. Nigerian Journal of Animal Production, 29(1)113-120.
- 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.
- 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.
- 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.

- Rabo, J.S., Biu, A.A. and Casimia, N.K.M.**, (2002). Experimental *Eimeria necatrix* Infection: Comparative Efficacy of Sulphonamides, Amprolium and Septrin in Cockrels. *Biosci. Res. Publication*. 14(2): 151-155.
- 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.
- 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.*
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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
- Shehu, M.M., J.U. Umoh, P.A. Abdu and L. Sa'du**, 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.
- Shittu, A.M., G.O. Olayode, O.M. Bamiro, and F.M.Aderimi**, 2004. Effects of using non-conventional feedstuff on the productivity and cost of egg farms in Ibadan, Nigeria. *Nigeria Journal of Animal production*, 31(1) 65-78.
- 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.
- 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.
- 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.
- Sonfada, M.L., M.N. Sivachelvan, p. Aletander, H.D Kwari, and I Wiam**, 2004. Post embryonic studies on bursa of Fabricus of domestic pigeon (*Columba livia*). In *proceeding of the 41st congress of the NVMA*, pp. 99.
- 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*.
- Suleman, M.H., A.S. Yila, P.A. Abdu, B.I. Onyeanus, 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*.
- T.T. Amos**, (2006): Analysis of Backyard Poultry Production in Ondo State, Nigeria. *International Journal of Poultry Science* 5 (3): 247-250, 2006.

- 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
- 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.
- 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.
- Tewe, O.O., Fawole, O.P., Abu, A.O., Oladele, O.A., Abdullah, A.R. and Oluwale-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.
- 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 Animal production*. 2004, held at Sokoto. Pp 222-224.
- 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.
- 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.
- 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.
- 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. *IJAAR* 2(1), 76-82.
- Tuleum 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.
- 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.
- Tuleun, C.D., M.C. Njike, S.A. Ikurior 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.
- 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.
- 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.
- 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.
- 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*.
- 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 Environment. *Sahel J. Vet. Sci.* 2: 23-26.
- 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.
- Uchendu, C.N.**, 2001. The effect of surgical bursectomy along with hemicastration on the gonadal activity of babbcock cockerels. *Nigerian Society of Animal Production*, 26: 76-79.
- Udedibe, 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.
- 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.
- 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.

- 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.*
- Ugwuene, M.C; O.C. Onwudike, B.F. Abasiokong, and C.M. Nnadike**, 2005. Effects of replacing maize with full-fat palm kernel meal in broiler diets. *Nigeria Society of Animal Production*, 30: 179-182.
- 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).
- 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.
- 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).
- 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).
- 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.
- 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).
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Wekhe S. N. and Nyeche V.N.**, (2002) performance of broilers on furazolidone additive. *Nig. J. Anim Prod.* 29(1) 16-20.
- 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.
- Wekhe, S. N.**, (2000). Responses of broilers to administration of graded levels of *Mansonia altissima*. *Delta Agric* 7, 15-21.
- 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.
- Wekhe, S.A and V. N. Nyeche**, (2002). Performance of broiler on furazolidone additive. *Nigerian Journal of Animal Production* 29(1), 16-20.
- 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.
- 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.
- 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.
- 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.

Annex IV

Maps

No maps available at the time of writing