



# Knowledge of poultry diseases, biosecurity and husbandry practices among stakeholders in poultry production in Kogi State, Nigeria

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## Abstract

Commercial poultry production is low in Kogi State even before the advent of highly pathogenic avian influenza (HPAI H5N1) outbreak in Nigeria. The low level of poultry production has persisted long after the socio-economic impacts of HPAI had improved. A study was conducted among 94 poultry stakeholders in the state with the use of questionnaire to assess their knowledge of poultry diseases, biosecurity and poultry husbandry practices in six Local Government Areas of Kogi State. The findings showed that 60.0% of poultry production was rural while the rest were backyard (semi commercial) poultry. About 64.7% of poultry kept were under extensive management with the commonest diseases seen under this management system being Newcastle disease (62.9%), Coccidiosis (52.3%), Fowl pox (46.9%), Gumboro disease (39.1%) and Fowl typhoid (36.1%). Biosecurity was poor as 92.9% of respondents did not have footbath or hand wash disinfection; 70% would throw away poultry litter in the refuse dump; 12% would use the poultry litter as manure while 11% would sell out the litter. In addition, 64.7% of the poultry farmers obtained their rearing stock from the live bird market and other unknown sources while only 35.3% obtained theirs from the hatchery. The findings of this study showed that the low level of commercial poultry production in Kogi State might be due to the impacts of diseases and poor husbandry practices undertaken by the farmers. It is recommended that government should train poultry farmers on biosecurity, disease prevention and the adoption of modern husbandry practices suitable for the traditional poultry production system.

**Keywords:** biosecurity, husbandry practices, poultry diseases, Kogi State, Nigeria.

## Introduction

Biosecurity refers to all the management practices aimed at excluding or reducing the potential for the transmission and spread of diseases to animals, humans or an area initially free from the diseases causing agents (Halifa, 2008). It is a term coined from two words: Bio – life, and Security – protection, with the two main objectives of biosecurity being bio-exclusion and bio-containment (AICP, 2008; USAID, 2009). Either of the two objectives of biosecurity has three components consisting of isolation, containment and sanitation.

Biosecurity is of much importance in poultry production in so much that the FAO based the classification of poultry production systems on the levels of biosecurity (Adene & Oguntade, 2006). Strict biosecurity measures in addition to vaccinations, are strategic prevention and control policies adopted to control some contagious poultry diseases as vaccinations alone are not enough to

control them under field conditions (Abdu, 2007). Good husbandry practices such as adequate feeding, housing and stocking to avoid overcrowding, good ventilation, proper disposal of wastes, cleaning and disinfection of poultry premises help to keep out infections and their spread (Jordan, 1990).

Traditionally, based on management, poultry production is grouped into intensive and extensive management systems (Pagani *et al.*, 2008)). The main management criteria used in these groupings are feeding, housing and biosecurity. Under the intensive management system, feeding, housing and other management requirements are adequately provided while feeding and housing are rarely provided under the extensive system (Adene & Oguntade, 2006). It is well known that poultry production under extensive management do not receive proper nutrition, suffer from effects of harsh weather and are exposed to various diseases than

the intensive system of management (Sonaiya, 1990).

Generally, current and comprehensive information on the poultry production sector in Nigeria is lacking (Adene & Oguntade, 2006). However, in Kogi State, commercial poultry production is low, with majority being rural poultry kept under extensive system of management (Adene & Oguntade, 2006). In spite of the fact that HPAI H5N1 was not reported in the state during the HPAI outbreaks in Nigeria, the low level of poultry production has continued long after the socio-economic impacts of the disease that led to drastic shortfall in poultry production in most parts of the country had improved (Ameji *et al.*, 2011).

This study was designed to access the knowledge of poultry diseases, biosecurity and poultry husbandry practices in six Local Government Areas of Kogi State so as to know the causes of the low level of poultry production and proper solutions to the problems. Primary data were obtained from the retrieved copies of the administered questionnaire to poultry stakeholders in the state.

#### Materials and methods

The study was carried out in six of the twenty-one Local Government Areas (LGAs) of Kogi State. Three of the six LGAs surveyed were those with high volume of poultry production while the other three were those with low volume.

Ninety-four (94) copies of a structured questionnaire were administered to respondents who were considered as poultry stakeholders with follow up interviews. The poultry stakeholders included in the study were Veterinary personnel and extension agents employed by the government, backyard poultry farmers, rural poultry farmers and live bird marketers.

The stakeholders answered questions on flock ownership, sources of poultry, purpose of rearing, management and production systems used, common diseases being observed, disease preventive measures in use and methods of handling sick and dead poultry.

Data generated from the retrieved copies of the questionnaire were analyzed using Statistical Package for Social Sciences Version 17 (SPSS Inc. Chicago, IL., USA, 2008) by descriptive statistics to calculate the frequency and percentages, presented in tables and charts.

#### Results

The 94 respondents that were interviewed were made of 9 (9.6%) Veterinary personnel and extension agents, 32 (34.0%) backyard poultry farmers, 21 (22.3%) rural poultry farmers and 32 (34.0%) live bird marketers. Eighty-five (90.4%) of the respondents represented farmers and live bird marketers that owned chickens directly while the remaining nine (9.6%) respondents did not own chickens but were engaged in healthcare and production activities.

Based on occupation, the 85 respondents that owned chickens were made of 14 (16.5%) civil servants, 23 (27.1%) poultry farmers, 32 (37.6%) live bird marketers, 7 (8.2%) house wives and 9 (10.6%) students (Table 1).

Ownership of rural poultry was in the hand of children and women with women being more among the live bird marketers than men. In addition, 61.2% of the farmers sourced chickens for rearing from the live bird markets, 35.3% from hatchery while 3.5% had their chickens given to them as gift (Table 2). On production systems, 60.0% of poultry produced were rural poultry while 40.0% were backyard poultry (Figure 1 and Table 2).

Based on the LGAs surveyed, Kabba/Bunu had 50% of poultry under backyard (semi commercial) production followed by Lokoja, 41.7% and Adavi, 41.2% respectively (Table 2). Equally, Kabba/Bunu and Lokoja LGAs had 40% of poultry under intensive management system while Adavi LGA had the highest percentage, 68.8% of poultry under extensive management system (Table 2). On sources of poultry for rearing, Kabba/Bunu LGA is highest in sourcing poultry from the hatchery while Adavi LGA sourced 66.7% of its poultry from the LBM (Table 2). However, only 7.1% of the respondents, who were backyard poultry farmers, had footbath or disinfectant for hand washing in their poultry facilities while 92.9% had none (Table 3).

Chickens produced under intensive management system were 35.3% while the remaining 64.7% under extensive (free-range) management system were both rural and exotic chickens (Tables 2 and 4). The common diseases of poultry being observed by poultry farmers under extensive management system were Newcastle disease (62.9%), Coccidiosis (52.3%), Fowl pox (46.9%), Gumboro disease (39.1%) and Fowl typhoid (36.1%) (Table 5).

On the assessment of handling of poultry waste, 6 (7.1%) of the respondents would bury the litter; 62 (72.9%) of the respondents would throw them in refuse dump while 17 (20.0%) of the respondents would use them as crop manure (Figure 2).

**Table 1:** Occupation of respondents and ownership of poultry in different production sectors in Kogi State.

Occupation of respondents	Backyard poultry (%)	Rural poultry (%)	Live bird market (%)	Total (%)
Farmer	17 (73.9)	6 (26.1)	0 (0.0)	23 (27.1)
Civil servant	14 (100.0)	0 (0.0)	0 (0.0)	14 (16.5)
Marketer	0 (0.0)	0 (0.0)	32 (100.0)	32 (37.6)
Housewife	1 (14.3)	6 (85.7)	0 (0.0)	7 (8.2)
Student	0 (0.0)	9 (100.0)	0 (0.0)	9 (10.6)
<b>Total</b>	<b>32 (37.6)</b>	<b>21 (24.7)</b>	<b>32 (37.6)</b>	<b>85 (100.0)</b>

**Table 2:** Sources of birds for rearing, production and management systems used by poultry farmers in Kogi State.

Local Government Area	Production System		Management System		Sources of Birds		
	Backyard (%)	Rural (%)	Extensive (%)	Intensive (%)	Gift (%)	Hatchery (%)	Live bird market (%)
Adavi	7 (41.2)	10 (58.8)	11 (68.8)	5 (31.2)	0 (0.0)	5 (33.3)	10 (66.7)
Ankpa	5 (33.3)	10 (66.7)	10 (66.7)	5 (33.3)	1 (6.7)	5 (33.3)	9 (60.0)
Dekina	4 (33.3)	8 (66.7)	8 (66.7)	4 (33.3)	1 (10.0)	4 (40.0)	5 (50.0)
Kabba/Bunu	8 (50.0)	8 (50.0)	9 (60.0)	6 (40.0)	0 (0.0)	6 (42.9)	8 (57.1)
Lokoja	5 (41.7)	7 (58.3)	9 (60.0)	6 (40.0)	0 (0.0)	5 (38.5)	8 (61.5)
Okene	5 (38.5)	8 (61.5)	8 (66.7)	4 (33.3)	1 (7.7)	5 (38.5)	7 (53.8)
<b>Total</b>	<b>34 (40.0)</b>	<b>51 (60.0)</b>	<b>55 (64.7)</b>	<b>30 (35.3)</b>	<b>3 (3.5)</b>	<b>30 (35.3)</b>	<b>52 (61.2)</b>

**Table 3:** The use of hand wash and footbath by backyard, rural poultry farmers and live bird marketers to prevent diseases in poultry facilities in Kogi State.

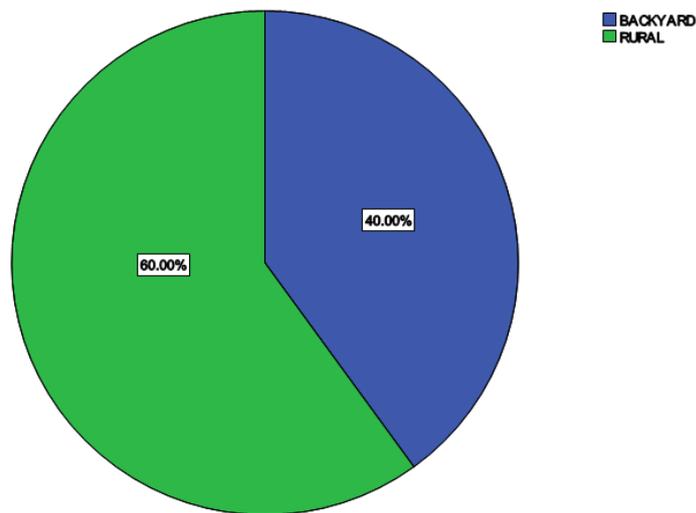
Poultry stakeholder	Hand/Footbath (%)	No hand/footbath (%)	Total (%)
Backyard poultry farmers	6 (18.8)	26 (81.3)	32 (100.0)
Live bird marketers	0 (0.0)	32 (100.0)	32 (100.0)
Rural poultry farmers	0 (0.0)	21 (100.0)	21 (100.0)
<b>Overall</b>	<b>6 (7.1)</b>	<b>79 (92.9)</b>	<b>85 (100.0)</b>

**Table 4:** Type of chickens reared by backyard and rural poultry farmers under different management systems in Kogi State.

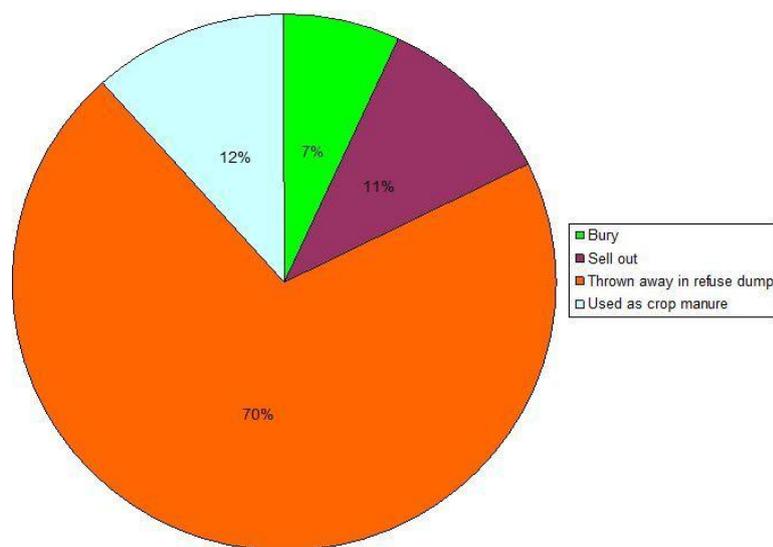
Type of chicken	Management system	
	Extensive /Free-range	Intensive
Broilers	1 (6.3)	15 (93.7)
Cockerels	8 (61.5)	5 (38.5)
Layers	0 (0.0)	13 (100.0)
Rural	43 (100.0)	0 (0.0)
<b>Overall</b>	<b>52 (61.2)</b>	<b>33 (38.8)</b>

**Table 5:** Common diseases observed by backyard and rural poultry farmers under different management systems in Kogi State.

Disease	Level of occurrence	Management System		Total
		Intensive (%)	Extensive (%)	
Newcastle disease	Common	26(37.1)	44 (62.9)	70 (100)
	Rare	8 (33.3)	16 (66.7)	24 (100)
Coccidiosis	Common	31(47.7)	34 (52.3)	65 (100)
	Rare	3 (10.3)	26 (89.7)	29 (100)
Gumboro disease	Common	28 (60.9)	18 (39.1)	46 (100)
	Rare	6 (12.5)	42 (87.5)	48 (100)
Fowl pox	Common	17 (53.1)	15 (46.9)	32 (100)
	Rare	16 (25.8)	46 (74.2)	62 (100)
Fowl Typhoid	Common	23 (63.9)	13 (36.1)	36 (100)
	Rare	11 (19.0)	47 (81.0)	58 (100)
CRD	Common	24 (100.0)	0 (0.0)	24 (100)
Birdflu	Rare	13 (18.6)	57 (81.4)	70 (100)
	Never	34 (36.2)	60 (63.8)	94 (100)



**Figure 1:** Systems of poultry production being used by farmers in Kogi State.



**Figure 2:** Poultry waste management by producers in the surveyed areas of Kogi State.

## Discussion

The result from this study showed that Newcastle disease (ND) is apparently the most common diseases observed by poultry farmers. Adene & Oguntade (2006) reported ND to be endemic and the most devastating disease of rural poultry in Nigeria. The indication of ND as the most common disease of poultry under extensive management system underscores the effects of disease as the bane of the low level of poultry production in Kogi State. Newcastle disease has a tendency to wipe out the entire poultry flock during outbreaks (Sa'idu *et al.*, 2004). Rural poultry farmers often avoid losses from the seasonal epidemic of ND by selling or slaughtering their chickens during the cold months to reduce flock size and stocking density as a means of prevention and control (Nwanta *et al.*, 2008). This is so because contagious diseases can easily spread and become difficult to control under poor management.

This study also reveals that Coccidiosis is the second most common disease seen by poultry farmers followed by Fowl pox, Gumboro disease and Fowl typhoid. These findings differ from the report by Adene & Oguntade (2006) of Gumboro disease to be the second most devastating disease of rural poultry probably due to differences either in time or in methodology. Also, Gumboro disease transmission is via contact with infected chickens and materials but the small flock size of rural chickens may not permit adequate contact among infected birds for disease spread. Generally, the findings showed these diseases commonly observed by poultry farmers to be associated with poor management as may be the case with extensive management system.

Kabba/Bunu and Lokoja LGAs have more poultry under backyard production probably due to high commercial activities in the two areas which make commercial poultry production profitable. Lokoja is the headquarters of the State with more economic activities and human traffic than the other areas surveyed. In the same vein, Kabba/Bunu and Lokoja LGAs had more poultry under intensive management system and sourced most of their rearing stock from the hatchery probably for similar reasons in addition to the ease of access of poultry farmers to new innovations and information on poultry farming. Awareness campaigns on diseases and agricultural innovations by government agencies are more in urban centres with high media coverage than in rural areas (Ameji, 2010).

Adavi LGA had the highest percentage of poultry under extensive management system as well as the highest in sourcing birds for rearing from the LBM. This may be due to the structure of poultry producers in this area which may not know the benefits of intensive management over extensive management system. In most parts of Africa,

peasant farmers keep poultry for hobby, sacrifice and family use (Halifa, 2008) and not as a commercial enterprise. Hence, the poultry are kept at a subsistence level under extensive management system with little inputs for increased productivity.

Equally, the present study indicate the likelihood of flaws in husbandry practices by most poultry farmers that may lead to disease introduction and spread. Bio-exclusion and bio-containment are important components of biosecurity (Halifa, 2008; USAID, 2009) hence, their absence will lead to disease incursion and spread. The actions of poultry farmers in the disposal of poultry waste in the refuse dump as well as being used as crop manure increase the risk of disease spread (Ameji, 2010). In addition, sanitation is poor, as greater majority of poultry farmers do not have footbath or hand washing provisions in their poultry facilities. These have serious implications on the spread of contagious poultry diseases by people and vehicles as well as being of public health importance regarding zoonoses such as HPAI. Although HPAI has never been reported in the state (AICP, 2008), the flaws in some aspects of biosecurity as seen in this study calls for concern as these may present the platforms for its introduction and easy spread within the state.

The study revealed majority of poultry production to be rural poultry classified as sector 4 by the FAO system (Adene & Oguntade, 2006). Rural poultry have low productivity either in terms of egg or meat production (Pagani *et al.*, 2008). This poor yield maybe one of the reasons apart from the effects of diseases why poultry production is low in the state. The FAO in its classification of the poultry sectors, placed backyard and rural poultry in sector 4 based on size, management and economic gain (Adene & Oguntade, 2006). However, backyard poultry in this study is considered different from rural poultry because of difference in size, breed of poultry and commercial value. From this study, backyard poultry are mainly of exotic breed kept for commercial purpose though, in small quantity of 50 – 2,000. This is an indication of transition from the traditional system of rural poultry that are kept for hobby, sacrifice and family use (Halifa, 2008) towards a commercial enterprise which should be encouraged. Furthermore, majority of poultry production in the state is done under extensive management. This finding agrees with previous reports that there are two management systems of poultry production in Nigeria with the extensive management predominating over the intensive management (Sonaiya, 1990; Adene & Oguntade, 2006; Pagani *et al.*, 2008). Poultry under extensive management system are poorly kept in terms of feeding, housing and healthcare (Sonaiya, 1990). The end-point of these effects is low productivity arising from myriad

causes such as poor nutrition, harsh weather condition, and disease impacts.

In conclusion, the production system is mainly traditional, of low productivity and it is associated with some flaws in biosecurity measures and prevalence of endemic diseases of high economic importance. The husbandry practices undertaken by poultry producers fall below standards and account for these noticeable flaws. Equally, it shows that poultry production is still traditional in spite of the concerted efforts to transform it globally into a commercial enterprise to guarantee food security (Adene & Oguntade, 2006).

It is recommended that government should undertake the training of poultry farmers on the adoption of standard and wholesome husbandry

practices in poultry production. Incentives should also be provided to rural poultry or smallholder poultry farmers to encourage them by removing the financial constraint to obtaining rearing stock from standard sources as well as in instituting biosecurity. It is cheaper to prevent diseases than treating them hence, poultry stakeholder should channel their resources and energy towards observing biosecurity.

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