KNOWLEDGE AND ATTITUDE OF POULTRY FARMERS TOWARDS BIOSECURITY AGAINST AVIAN INFLUENZA H5N1 IN KADUNA STATE, NIGERIA

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Abstract
The reported outbreak of Avian Influenza (H5N!) in August and September 2015 prompted this cross-sectional survey to appraise the knowledge and attitude of poultry farmers regarding biosecurity against the disease. A structured questionnaire was administered to 112 poultry farmers randomly selected from two of the three senatorial zones in Kaduna State. Data generated were analyzed using descriptive and inferential statistics. The socio-economic characteristics of the farmers revealed a mean age of 39.5 years predominance of male farmers and a reasonably high level of educational attainment. Majority of the respondents were small scale operators (56.39) and while the level of awareness of disease was found to be high (86.6%), only 48.2% had knowledge of the cause and nature of disease. Regression analysis showed that only educational status and flock size significantly influenced adoption of biosecurity measures (P<0.05). Constraints limiting adoption were identified and recommendations aimed at enhancing biosecurity were proffered.

Keywords: Knowledge Attitude Poultry Farmers Biosecurity Avian Influenza

Introduction

There is no gainsaying that the Nigerian poultry industry has come of age and commands recognition as a viable sector of the national economy. Unarguably, poultry keeping is the most popular livestock enterprise adopted by small and medium scale farmers in both rural and ubran areas of Nigeria (Idowu *et al.*, 2005; Afolayan *et al.*, 2014). According to Ozoedu *et al.*, (2015), poultry production represents the fastest means of correcting the shortage of animal protein intake, because poultry has the best efficiency of nutrient transformation into high quality animal protein.

However, sight must not be lost of the fact that the poultry industry, promising as it seems, has been bedeviled with a myriad of daunting challenges with mitigating consequences. Notable among these challenges is the Avian Influenza popularly known as Bird flu which was first reported in Kaduna in 2006.

The highly pathogenic Avian Influenza (HPAI) is a devastating virus infection of the strain H5N1 usually associated with high mortality rates which may lead to disruptions in production and trade. The disease, being zoonotic, may be transmitted from birds to humans and is a potential source of future human influenza epidemic (Thamawat *et al.*, 2004; Wakawa *et al.*, 2015).

Problem Statement and Objectives of the Study

As already mentioned, bird flu is very lethal, highly pathogenic and usually results in massive depopulation of poultry stocks any time there is an outbreak. The outbreaks reported in 2006 and 2007, firstly in Kaduna and subsequently in other parts of the country, took a massive toll in its wake. As the poultry industry was recuperating from this onslaught after its containment in 2008, fresh outbreaks were reported in August/September, 2015 and recently in January 2016, more outbreaks have been reported in about six states.

Highly pathogenic and devastating as bird flu is, it is gratifying to note that the disease is preventable and can be controlled and contained. According to FAO (2008), the HPAI, like any disease spreads primarily through human activities, is susceptible to biosecurity measures along the production and marketing chain. It is this that makes biosecurity an important tool for the control and eradication of H5N1 HPAI. Infact, regarding 2015 outbreaks, the Poultry Site News Desk of August 19, 2015 had this to say: "The disease report to the World Organization of Animal Health (OIE) commented that the one farm and three backyard operations involved displayed poor biosecurity".

Given that the 2006/2007 outbreaks of bird flu took everybody off guard, being the first time, why are we having resurgent outbreaks in recent months? Are Nigerian poultry farmers aware and knowledgeable of biosecurity measures (BSM) that must be put in place to keep the disease in check? These questions coupled with the apparent dearth of information on the subject have made this study an imperative. The specific objectives of the study are to:

i. Describe the socio-economic characteristics of poultry farmers in the area of study

ii. Ascertain the level of awareness and knowledge capacity of the respondent about bird flu.
iii. Determine the factors that influence the adoption of biosecurity measures by the farmers.
iv. Identify the constraints that mitigate the adoption of biosecurity measures by the farmers.

Methodology of the Study

A cross-sectional survey of small, medium and large scale poultry farmers in Kaduna North and Kaduna Central Senatorial districts of the state was carried out using a structured questionnaire and involving 120 randomly selected farmers. At the end of the exercise 112 questionnaire were duly completed and constituted the sample size for the study. Data generated were analyzed using descriptive statistics and linear regression analysis. A 4-point Likert-type scale was used to appraise the attitude and compliance with biosecurity measures. The scales are: strongly agree and strictly observed (SASO =4), Agree and Observed (AO=3), Disagree but observed sometimes (DOS=2) and strongly disagree and not observed (SDNO=1).

Results and Discussion

Results of the study are discussed under the following sub-headings:

Socio-Economic Characteristics of Poultry Farmers

Socio-economic characteristics of the poultry farmers examined include age, gender, education status, farming experience, farm/flock size and extension/veterinary contact.

Table 1: Distribution of Poultry Farmers based on Socio-economic characteristics

Characteristics	Frequency (n=112)	Percentage
Age		
15-24 years	7	6.3
25-34 years	26	23.2
35-44 years	48	42.8
45-54 years	22	19.6
55-64 years	9	8.0
Mean	**39.5 years**	
Gender		
Female	50	44.6
Male	62	55.4
Educational status		
Primary education	17	15.2
Secondary education	32	28.6
OND/NCE	35	31.3
HND/B.Sc./PGD/M.Sc	21	18.8
.Ph.D	7	6.3
Forming Experience		
<5 years	12	10.7
6-10 years	27	24.0
11-15years	44	39.3
>16 years	29	36.0

Source: Field survey (2015)

Result in table 1 showed that the mean age of the respondents was 39.5 years, with over 65% of them aged between 25 and 44 years. There were more males (55.4%) than females (44.6%) in the sample and the educational attainment of the respondents could be adjudged as reasonably high. Over 63% of the poultry farmers had put in between 5 and 15 years in the business of keeping poultry

Based on the farm/flock size, the distribution of the respondents is as shown in table 2.

Table 2: Distribution of Respondents Based on Flock size

Category/flock size	Frequency	Percentage
SS:<1000 birds	65	58.0
MS 1000-2500 birds	34	30.4
LS>2500 birds	13	11.6
Total	112	100

Source: Field survey (2015)
Note: SS = Small scale MS= Medium scale
LS = Large Scale

Majority of the poultry farmers in the sample (58%) were small scale operators, 30.4% were medium scale while only 11.6% fell into the large scale category. Contact with extension/veterinary agent was recorded as generally poor because only 17.8% of the farmers claimed to have contact quarterly, 22.3% once in six months and 49.1% once a year. Zero scores were recorded for 'once a month' and 'twice a month' while 10.7% indicated they hardly made any contacts. These observations were consistent with the findings of Ezeh *et al.*, (2015) on information seeking behavior of poultry farmers where the number of those who sought veterinary advice was dismal.

Awareness and knowledge of Bird flu by Respondents

The study sought to ascertain the level of awareness and knowledge of cause and nature of disease among the farmers.

Table 3: Distribution of Poultry Farmers Based on Level of Awareness and Knowledge of Bird flu

Response	Awareness of bird flu (H5N1) Disease	Knowledge of cause and nature (clinical signs) of disease
Yes	97 (86.6)*	43 (38.4)*
No	15 (13.4)*	69 (61.6)
Total	**112 (100)**	**112 (100)**

Source: Field survey (2015)
Note: * figures in parenthesis represent percentage

The responses in table 3 indicated that a high percentage of the farmers (86.6%) were aware of the disease while only 13.4% were not. With respect to the knowledge of cause and clinical signs of bird flu, 38.4% had knowledge while 61.6% admitted not having knowledge of the cause and clinical signs of avian influenza. Apparently, poultry farmers are yet to fully understand the nature of the disease since the first outbreak in 2006. As reported by Saidu *et al.*, (2008), "the

absence of H5N1 in Nigeria prior to the outbreak of January 2006 made the diagnosis difficult for both veterinaries and poultry farmers

Attitude and Observance of Biosecurity Measures (BMS)

The attitude of the poultry farmers and their strict observance of key biosecurity measures against bird flu (FAO, 2008; Gov. UK, 2014) were appraised as shown in table 4 using the 4-point Likert-type scale explained in the methodology.

Table 4: Attitude and Observance of Biosecurity measures by Poultry Farmers

S/N	Biosecurity Item	Aggregate Score (Σx)	Mean ($\bar{x}$)
1.	Always remain vigilant for signs of disease	294	2.62*
2	Register poultry farm with a vet clinic	272	2.43
3	Seek prompt attention of a vet when there are concerns	316	2.82*
4	Cleansing and disinfecting protective clothes footwears, vehicles, equipment before and after contact with poultry	249	2.22
5	Reduce movement of people, vehicles and equipment from and into areas where birds are	308	2.75*
6	Thoroughly cleansing and disinfecting housing at the end of a cycle	348	3.11*
7	Avoiding contact between poultry and wild birds	263	2.35
8	Always maintaining clean surroundings around poultry pens	307	2.74*
9	Not recycling egg trays from and into poultry farms	217	1.94
10	Do not introduce old birds from other farms e.g at point-of- lay	278	2.48

Source: Field survey (2015)
Note: *mean ($\bar{x}$) ≥ 2.5

Results shown in table 4 indicate that only five of the key biosecurity measures examined had means of 2.5 and above implying reasonable observance of biosecurity measures. These items with positive compliance had means ranging from 2.62 for item (1) to 3.11 or item (6). A look at the poorly observed biosecurity measures indicated poor compliance with critical issues which are key to preventing and controlling bird flu e.g items 7, 9 and 10. While wild birds are known as the priority carriers of the bird flu virus (FAO, 2008), the recycling of egg trays from and into poultry farms portends great danger. As pointed out by Wakawa *et al.*, (2008), the introduction of new birds (without history of health status) into an already existing flock was probably responsible for the outbreaks in two of the cases reviewed in Zaria. Also, Saidu *et al*,. (20008) reported that the farm from which bird flu was first suspected and later diagnosed in Kaduna State had purchased some point- of- lay pullets from several farms in Kano prior to the outbreak of AI on the farm.

Socio-Economic Factors Influencing Adoption of Biosecurity Measures

Linear regression was run against the socio-economic characteristics examined in the study to determine those that influenced the adoption of biosecurity measures by the farmers.

Table 5: Socio-Economic Factors influencing the adoption of biosecurity measures

Socio economic variable	Coefficient	t-value	Remarks
Age	-077	-636	NS
Gender	-010	-115	NS
Educational status	.217	2.018	*
Farming experience	.011	-142	NS
Farm/flock size	119	1.120	*
Extension/vet contact	-.192	-2.394	NS

Source: Field survey (2015)
Note: * significant at $P<0.05$
NS= not significant

The regression analysis results showed that only two variables education attainment and flock size were statistically significant at $P<0.05$ level. Age, gender, farming experience and extension/vet contact did not significantly influence the observance of biosecurity measures by the respondents.

Constraints limiting the observance of Biosecurity measures

In the light of the devastating consequences of the poor observance of biosecurity measures against bird flu, the study sought to identify the constraints limiting strict observance.

Table 6: Constraints Limiting the Strict Observance of Biosecurity Measures

Constraints	Frequency	Percentage	Ranking
1. Poor knowledge of biosecurity measures	65	15.0	2nd
2. Measures are laborious and time consuming	57	13.1	5th
3. Difficult to access/contact vet in the area	54	12.4	6th
4. High cost implications	78	18.0	1st
5. Few hands/labourers on the farm	63	14.5	3rd
6. Technical nature of biosecurity measures	28	6.4	8th
7. Nonchalant attitude/carelessness	32	7.4	7th
8. Poor/advocacy/sensitization on bird flu	58	13.3	4th
Total	**435***	**100**	-

Source: Field survey (2015)
*Multiple responses

Major constraints identified in order of ranking, include high cost implications, poor knowledge of BSM, and few hands on the farm. Poor advocacy/sensitization on disease and the labourious/time consuming nature of BSM ranked 4th and 5th respectively. Apparently, accessing a vet, technical nature of BSM and careless attitude (6th, 7th and 8th.) did not bother the farmers much.

Conclusion and Recommendations

Devastating as avian influenza is, it is gratifying that the disease can be prevented and controlled. The findings here indicate that while majority of poultry farmers were aware of the disease, knowledge of the clinical signs and even biosecurity measure against it was found to be generally poor. Knowledge is power and in this matter, will help the farmers save the huge investments they have made in the business. the following recommendations are proffered with a view to enhancing knowledge and forestalling further outbreaks of HPAI.

a. Being pro-active and embarking on a sustained surveillance to help nip outbreaks in the bud.
b. More diagnostic centres are required for rapid diagnosis and attention
c. Stronger synergies between agencies and stakeholders for impactful intervention.
d. More advocacy and sensitization is required to enhance knowledge of clinical signs of disease and BSM.

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