BIOSAFETY RISK STATUS OF BACKYARD POULTRY FARMS IN SOME RURAL AREAS OF NORTH CENTRAL NIGERIA

[*]H. Y. Ibrahim, [+]H. Bawa and [+]A. A. Girei

[*]Department of Agricultural Economics, Federal University, Dutsin-Ma, Katsina State, Nigeria

+Department of Agricultural Economics and Extension, Nasarawa State University, Keffi, Nigeria

ABSTRACT

Using a sample of 50 backyard poultry farmers selected using a snow ball sampling technique; the study determined the awareness, adoption levels of biosafety practices and biosafety risk status of backyard poultry farms in a rural area of north central Nigeria. Simple descriptive statistics and the traffic light model were used for data analysis. The level of awareness of biosafety practices was very high and up to 100% in some cases for some biosafety measures such as daily inspection of flocks, vaccination of birds, provision of clean water and provision of good ventilation in the poultry house. The awareness level was however very low for biosafety measures such as provision of foot-dip with disinfectant, use of protective clothing and hand gloves. On the other hand, the adoption levels was above 80% for most biosafety practices but as low as 2% for biosafety measures such as isolation of sick birds, checking symptoms of diseases before purchasing birds, use of hands gloves, use of dry litter material, restraining of visitors into the farm and provision of foot-dip with disinfectant. In terms of biosafety risk status, half of the farms (50.0 %) have a high biosafety risk status while 42.0 % have a medium biosafety risk status. The remaining 8% have a low biosafety risk status. From the fore going, there is an indication that backyard poultry farms may not be able to sufficiently safeguard against or reduce an outbreak of poultry diseases. Sensitization and more awareness on the need for the adoption of all biosafety measures need to be intensified by extension workers and veterinary officers.

Keywords: Biosafety, awareness, adoption, poultry, backyard

INTRODUCTION

The outbreak of diseases remains one of the major threats to the development of the poultry production in Nigeria Adewole (2012). The inherent vulnerabilities of the poultry industry in Nigeria to diseases became evident after the outbreak of the Highly Pathogenic Avian Influenza (HPAI) virus disease in Nigeria in February 2006. Vaccination and treatment have traditionally played an important role in the management of poultry diseases. However, the most effective form of protection against farm bird diseases is biosecurity, which is the exclusion of diseases from the farming environment or their containment in the advent of outbreaks (Radostits, 2001; FAO, 2004; DuPoint Animal Health Solutions, 2009). Bio-security has great potentials of reducing, controlling and preventing the spread of disease pathogens within the poultry flock and possible experience of zoonosis from poultry management. However, several studies in Nigeria have shown that the level of awareness, adoption and technical knowledge on bio security is generally low and worrisome among poultry farmers (Ameji *et al*., 2012; Eze *et al*., 2017; Oluwasusi *et al*., 2018). Bio-security measures are a combination of systems and practices to reduce the burden of any disease producing agent on the farms and therefore prevent the adverse effects of diseases on the farm (Ajewole and Akinwunmi, 2014). Cardona and Douglas (2001) posited that a comprehensive biosecurity programme should include three major elements; isolation, traffic control and sanitation. The biosecurity risk status of commercial poultry farms in north western Nigeria is high (Alhaji and Odetokun, 2011) but there is a dearth of information on the situation in the backyard poultry farms in the north central and this needs to be investigated. The Knowledge of current on-farm biosecurity measures will be relevant in designing farm advisory services on biosecurity measures for poultry

farmers in Nigeria. The objectives of the study are as follows; to determine the level of awareness and adoption of biosafety practices by backyard poultry farmers as well as the biosafety risk status of backyard poultry farms.

MATERIALS AND METHODS

The study was conducted in some rural areas in Wamba Local Government Area (LGA) of Nasarawa State, Nigeria. The population for the study consists of selected smallholder backyard poultry farmers in Wamba LGA of Nasarawa State. A cross sectional sample survey design was adopted for the study. This involves the use of observational data which was collected with the aid of questionnaire from small holder backyard poultry farmers in the study area. Five villages where backyard poultry production is prominent were purposively selected from the LGA. Furthermore, 10 small holder backyard poultry farmers were selected in each village using a snowball sampling technique to give a total of 50 respondents for the study. Data were collected on awareness and adoption of biosecurity practices. Simple descriptive statistics was used to achieve the objectives of the study. A modified version of the traffic light system model designed by Grabkowsky (2009) for biosafety risk analysis was used to determine the biosafety risk status of the farms. The model uses the three colour indicators of a traffic light to represent risk levels associated with each poultry farm based on the number of biosafety measures currently (adopted) in use at a point in time by a poultry farmer. According to Alhaji and Odetokun (2011), in the model, Red represents high risk Yellow for medium risk and Green for low risk. Each biosecurity measure used by respondents was scored 1, while each biosecurity not used by the respondents was scored 0. The total score for each respondent was converted to percentage and a score of greater than or equal to 80% was regarded as low risk biosecurity status, 50-79% as medium risk status while a score less than 50% was regarded as high risk biosecurity status. This classification is a modified version of the classification by Eze *et al*. (2017).

Results and Discussion

Awareness of Biosafety Measures

The level of awareness and adoption of biosafety practices in poultry production is presented in Table 1. The result revealed that the level of awareness is generally high and up to 100 % in some cases for some biosafety measures such as daily inspection of flocks, vaccination of birds, provision of clean water and Provision of good ventilation in the poultry house. The awareness level was however very low for biosafety measures such as provision of foot-dip with disinfectant, use of protective clothing and hand gloves. The high level of awareness can be attributed to advisory services provided by the extension workers and veterinary workers as well as information obtained from other poultry farmers. This is in line with the results obtained in a study by Chah *et al*., (2017).

Table 1: Level of Awareness of Biosafety Practices

Biosecurity Measures	Awareness	
	Frequency	**Percentage**
Inspecting flocks daily	50 (0)	100 (0)
Regular disinfection of poultry	48 (2)	96.0 (4)
Restraining of visitors into the farm	35 (15)	70.0 (30)
Provision of foot-dip with disinfectant	17 (33)	34.0 (66)
Avoiding contact with local/migratory birds	45 (5)	90.0 (10)
Use of protective clothing	17 (33)	34.0 (64)
Provision of good ventilation in the poultry house	50 (0)	100.0 (0)
Constant cleaning of litter	48 (2)	96.0 (4)
Proper disposal of dead birds	49 (1)	98.0 (2)
Vaccination of birds	50 (0)	100.0 (0)
Keeping birds of different ages separately	44 (6)	88.0 (12)
Use of dry litter material	37 (13)	74.0 (26)
Use of hands gloves	13 (37)	26.0 (72)
Proper ventilation	49 (1)	98.0 (2)
Provision of clean water	50 (0)	100.0 (0)
Isolating of sick birds	34 (16)	68.0 (32)
Checking symptoms of diseases before purchasing birds	32 (18)	64.0 (36)

Source: Field Survey, 2020 *The No responses are in parentheses

Adoption of Biosafety Measures

The adoption levels for biosafety practices are presented in Table 2. The adoption level was above 80% for most biosafety practices but as low as 2% in some cases. The following biosafety measures were the least adopted among the respondents, isolation of sick birds, checking symptoms of diseases before purchasing birds, use of hands gloves, use of dry litter material, restraining of visitors into the farm and provision of foot-dip with disinfectant. This implies that the farmers do not implement very strict biosafety measures on their farms thus, making them vulnerable to disease outbreak and spread. Chah *et al.,* (2017) however observed that the adoption level for bio-safety measures was more than 95% among poultry farmers in south eastern Nigeria. The very low level of adoption of some biosafety measures can be attributed to inadequate information on the importance and implications of adopting all biosafety measures and not just some of the measures.

Table 2: Level of Adoption of Biosafety Practices

Biosecurity Measures	Adoption	
	Frequency	**Percentage**
Inspecting flocks daily	48 (2)	96.0 (4.0)
Regular disinfection of poultry	41(9)	82.0 (18)
Restraining of visitors into the farm	17 (33)	34.0 (64)
Provision of foot-dip with disinfectant	1(49)	2.0 (98)
Avoiding contact with local/migratory birds	24 (26)	48.0 (52)
Use of protective clothing	3 (47)	6.0 (94)
Provision of good ventilation in the poultry house	49 (1)	98.0 (2)
Constant cleaning of litter	11 (39)	22.0 (88)
Proper disposal of dead birds	47 (3)	94.0 (6)
Vaccination of birds	46 (4)	92.0 (8)
Keeping birds of different ages separately	28 (22)	56.0 (44)
Use of dry litter material	11 (39)	22.0 (78)
Use of hands gloves	0 (50)	0.0 (100)
Proper ventilation	48 (2)	96.0 (4)
Provision of clean water	50 (0)	100.0 (0)
Isolating of sick birds	21 (29)	42.0 (58)
Checking symptoms of diseases before purchasing birds	4 (46)	8.0 (92)

Source: Field Survey, 2020 *The No responses are in parentheses

Biosafety Risk Status of Backyard Poultry Farmers

The result in Table 3 shows that half of the farms (50.0 %) have a high biosafety risk status while 42.0 % have a medium biosafety risk status. This implies that majority of the backyard poultry farms may incur substantial economic losses in the event of any outbreak of a poultry disease. This result clearly indicates that the number of biosecurity measures adopted is not adequate to reduce or prevent disease outbreak on backyard poultry farms. On the other hand, only very few farms (8%) can be considered to be out of the woods in terms of biosafety risk status. A similar finding was also made by Alhaji and Odetokun (2011) among free range poultry flock in north central Nigeria.

Table 3: Biosecurity Risk Status of Backyard Poultry Farmers

Biosafety risk status	Traffic light sign	Frequency	Percentage
High risk	Red	50	
Medium risk	Yellow	42	
Low risk	Green	8	
Total		**100**	

Source: Field Survey, 2020

CONCLUSION AND RECOMMENDATION

Backyard poultry farms are vulnerable to disease outbreaks and spread due to inadequate adoption to all the biosecurity measures. Extension workers and veterinary officers need to educate poultry farmers on the need to adopt all biosafety measures in order to prevent an outbreak and spread of poultry diseases and possibly zoonosis.

REFERENCES

Adewole, S.O. (2012). The Efficiency of Drugs in the Treatment of Coccidiosis in Chicken in Selected Poultries. *Acad. Res. Int.,* 2(1), 20-24.

Ajewole, O. C. and Akinwumi, A.A. (2014). Awareness and Practice of Bio-security Measures in Small-scale Poultry Production in Ekiti State, Nigeria. *Journal of Agriculture and Veterinary Science*, 7(11), 24-29

Alhaji, N. B. and Odetokun, I. A. (2011). Assessment of Bio-security Measures against highly Pathogenic Avian Influenza Risks in Small-scale Commercial Farms and Free-range Poultry Flocks in the North Central Nigeria. Trans-boundary and Emerging Diseases, 58, 157–161.

Ameji, O.N., Abdu, P.A., Sa'idu, L. and Isa-Ochepa, M. (2012). Knowledge of Poultry Diseases, Bio security and Husbandry Practices among Stakeholders in Poultry Production in Kogi State, Nigeria. *Sokoto Journal of Veterinary Sciences,* 10(2), 26-31.

Cardona, C. J and Douglas, K. (2001): Biosecurity on Chicken Farms. Commercial Chicken Meat and Egg Production. Fifth Edition. Edited by Donald D. Bell and William D. Weaver.(Kluwer Academic Publishers, P.O. Box 322, 3300 AH Donrdrecht,2001)The Nethelands. Pp: 543- 556.

Chah, J.M., Uddin,.I.O., Irohibe, I.J., and Igbokwe. E.M (2017) Bio-security Measures Employed by Poultry Farmers in Enugu State, Nigeria. *Journal of Agricultural Extension,* 21 (3), 89-104.

DuPoint Animal Health Solutions (2009): Economic Benefits of Biosecurity in Poultry Farming.

Biosecurity and Hygiene Feature Articles. Available at: http://www.thepoultrysite.com/articles/5/. (accessed September 11, 2020).

Food and Agriculture Organization (FAO) (2004). FAO, OIE and WHO Technical Consultations on the Control of Avian Influenza. Animal Health Special Report. Available at: http:// www.fao.org/ag/againfo/subjects/en/health/diseases (accessed July 11 2020).

Eze, C.O., Chah, J.M., Uddin, I.O., Anugwa, I.J., and Igbokwe, E.M. (2017). Bio-security Measures Employed by Poultry Farmers in Enugu State Nigeria *Journal of Agricultural Extension.* 21 (3), 89-104.

Grabkowsky, B. (2009). Strategies for Prevention, Monitoring and Control of Avian Influenza at Farm Level. Available at: tp://www.thepoultrysite.com/articles/1421/. (accessed June 13, 2020).

Oluwasusi,J.O., Akanni, Y. O., and Sodiq, A.R. (2018). Effectiveness and Benefits of Biosecurity Practices in Small Scale Broiler. *Journal of Poultry Research,* 15(1), 6-12.

Radostits, O. M. (2001). Control of Infectious Diseases of food Producing Animals. Herd Health, Food Animal Production Medicine, 3rd Edition. Saunders Company, New York.