



LEVEL OF HEALTH RISK AMONG POULTRY WORKERS IN NIGERIA

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ABSTRACT

Poultry, also known as domestic fowl are winged animals domesticated for their nutritional and economic reasons. One of the problems generated from their intensive management method is the long time exposure of poultry workers to dangerous gases which has led to various health implications among the workers. This project considers various units within poultry firm to know the level of risk in poultry firm. One Hundred copies of questionnaires were disseminated among staffs of three different farms in Osun and Oyo states to gather information. Likewise, personal observations / interview of poultry staffs were not left out. The farms visited included Tuns (Osogbo), Zartech (Ibadan) and Vina (Ibadan) farms, Osun and Oyo States respectively. Different units such as: pen house, laboratory, farm workshop (maintenance engineers, technician), Administrative offices were captured with the questionnaires. Result obtained shows that cholera, E. coli, salmonellosis, staphylococcus, Avian flu, Mark, New castle diseases and diarrhea were the most common diseases affecting poultry workers. It was also gathered that, the chemicals used as disinfectant contributes to cough, catarrh, sore throat and breathing difficulty especially among the pen attendant who spend most of their working hours in the pen house. It was observed from the results that pen attendants who have spent between 0-2, 2-5, 5-10 and 10-15 years on the job have 0%, 33.33%, 15.5% and 0% of related diseases were at high risk of respiratory disorder, cough and catarrh. Whereas, 0%, 0%, 14.3% and 0%; 0%, 0%, 20% and 50%; and 0%, 0%, 28.6% and 16.7% of related diseases such as Headache, catarrh, sore throat, and other respiratory diseases were recorded for laboratory scientist, engineering and administrative (other) units with working experience of 0-2, 2-5, 5-10 and 10-15 years, respectively. This may be due to longer hrs of time spent by pen attendant in the pen house as compared to other staff members from other units. Based on the findings, it can be concluded that pen attendant who work more in the pen house are more prone to health implications in poultry firms.

Keywords: Health, Poultry, Pen attendants, Engineering, Technician

INTRODUCTION

Poultry, also known as domestic fowl, refers to a wide variety of winged animal species which are nutritionally and economically useful to man. Such include; chicken, (*Gallus domesticus*), duck (*Anas platyrhynchos*), Quail (*Coturnix coturnix*), among others. They belongs to the class 'Aves'. The class is distinguished by their feather coverings which make them to be distinct from animals with mammary glands and hair on their body.

They are good source of food protein and can be consumed in various ways such as fried, boiled, roasted, or to complement carbohydrate food when cooked in stew of choice. They are also raised for functions such as cock-fighting, early morning crowing which made the cock to be valuable as a time piece and also a symbol of waking day. It also represents a symbol of fertility since they lay eggs in abundance, hen were traditionally carried in front of Jewish bridal couples and also cocks were used

for rooster (Mahendra, 2016). Its importance is enormous apart from the eggs and meat for human consumption; they can also be used in cosmetics or vaccine production. Also, its droppings are of importance especially in crop farming where it is used as manure to fertilize agricultural farmland instead of the artificial fertilizer or as feed for fish in ponds. Their feathers are also used for making pillow.

Generally, poultry are kept in most areas of the world for both economic and dietary reasons both for meat and egg production. They multiply within a very short period. This had led to its high demand for commercial purpose. They can be stored on the farm either as live birds or to produce eggs and used as food when the need arises (Dorji *et al.*, 2011). Their management system can basically be in the form of free-range (i.e. these types of birds are allowed to move about during day time for their feeding and return to their owners at night). This practice enables low-income farmers to provide a source of meat protein with a low fixed investment due to the fact that they can feed on native feeds (Ralph, 2005). Secondly, the semi-intensive (here, the birds are not fully captured in a secluded place) and thirdly, intensive (here, the poultry are totally captured in a place where feeding, health care services, among others are provided). Meanwhile, the initial cost of production equipment, housing facilities and quality eggs to produce new offspring are the challenges in the latter management method (Sims *et al.*, 2003 and Gilbert *et al.*, 2006). Poultry production is very easy as compared to other livestock, especially, if it is raised in free range, there is little or no cost of feeding and housing attached. Although, this seems efficient with little or no input from the farmer, but the low egg production and survivability of the young chicks calls for special attention to boost the output. The first requirement for growing poultry (i.e. broilers, layers, etc.) in an intensive way is provision of suitable and adequate housing especially for brooding operation. The house should contain equipment / facilities to comfort the living of the bird, such that, it regulates the effect of temperature, moisture, ventilation and air movement for odour and dust from poultry house. Air quality and

lighting in the house are of importance. Provision should be made for feeding, watering/drinking, brooding operations. The building roof should be well insulated and have control over temperature, ventilation and air movement. Equipment such as air inlets, exhaust fans, heaters, evaporative cooling system, thermostat, timers to control environmental factors should also be provided. Supply of adequate and quality water is of utmost importance to meet the requirement on the farm. However, there are numerous challenges associated to poultry production depending on the production method that is being practiced. The unit / section in poultry farm may also be part of instigation for the level of risk.

Various units in Poultry Establishment

The various units in poultry establishment include the following:

- i. **Pen unit:** This is where birds are kept and pen attendants have direct interaction with the birds. The attendant who works in this unit are liable for stocking, feeding, cleaning, egg picking who often works for about eight (8) hours or more daily.
- ii. **Engineering unit:** this unit is responsible for production, fixing and repairs of equipment and machines used on the farm ranging from feeders, drinkers, heaters, generator plants.
- iii. **Laboratory unit:** the unit is responsible for taking care of the birds, in terms of administering of vaccine, drug, disinfecting the farm, detection of disease and finding solution to prevent its outbreak.
- iv. **Human resources:** the unit is responsible for keeping detailed information of routine activities such as stocking, maintenance, marketing of products in the farm, among others.
- v. **Health center:** here, members of staff are treated in case of any ailment and curbing the spread of infectious disease.

Each of the units and production methods practiced has its own level of risk for introduction of pathogens, disease development and spread within and to other units. Such factors that may cause

disease outbreak includes, the farm density (size and level of mechanization) and linkages that connects those farms through production and market chains (i.e. disease spread due to fomites) which may lead to outbreak of disease (Marangon *et al.*, 2004 and Truscott *et al.*, 2007).

Poultry farm workers (mostly pen attendant, laboratory and engineering staffs) are exposed to traumas due to postures and movement associated with their work (such as loading the feeders with feed, egg picking, repair and maintenance of equipment). Such hazards may be during stocking and transporting of the fowls where disease can be spread and transmitted either from the birds or from the use/handling of contaminated equipment. Also, the atmosphere where birds are raised contains high level of noise from either the birds or the equipment especially, in an intensive confined systems, this may leads to hearing disorder of members of staff whose obligation is in direct relation to the poultry pen (mostly the pen attendant whose major work is in the pen unit, the laboratory attendant who visits the pen unit on regular basis either to administer vaccine or to examine the health of the birds and engineers whose visit is on request of repair or maintenance of faulty equipment).

Hazards in Poultry Environment

There are various hazards in poultry environment that have great impact on health of the workers, although, units where individual workers carried out daily activities are may be the primary factors of influence. The hazards range from accidental, physical, chemical and biological.

- a) **Accidental hazards:** This can be sprains / strains from slips, falls when carrying heavy materials such as feeds, working in congested or slippery areas full of accumulated left over feeds, excreta. Eye or skin irritation due to exposure to disinfectant, vaccination, fumigation, cleaning of pen house, burns due to exposure to hot surfaces when operating equipment such as incubator, debeaking machine, among others can constitute

accidental hazards, and hence should be careful in its operation.

b) **Physical hazards**

These are basically high level of noise from either birds or operating equipment such as fan, heater, among others.

c) **Chemical hazards**

These include respiratory irritation, immunological mediated diseases from rhinopharyngitis, hyper sensitivity pneumonitis due to accumulated exposure from dust, odour and asphyxiating gases from congested environment, especially in a closed system. Such may include; ammonia due to degradation from manure, carbon dioxide due to respiration from the birds, fermentation from animal left-over feeds, dungs, combustion from equipment and machines (Truscott *et al.*, 2007). Also, cleaning (detergents) and disinfecting materials (such as ammonia solutions, sodium bicarbonate, hydrogen chloride, formaldehyde (i.e. carcinogenic solution) used in hatcheries and brooder house) has impact on the health of the handler. Therefore, care should be taken in its usage.

d) **Biological hazards**

This came up due to zoonotic diseases and infections transmitted between poultry animals and human being in close contact with such animals. Such include, virus, bacteria, fungi, endotoxins rickettsia and other microbes.

Method of waste disposal in poultry environment is very important and should not be underrated. Waste generated from various units (such as pen, laboratory, health center, et.c.) should be properly disposed to curb the spread of disease outbreak (Bello, 2009). The forms of waste does not only consist of left over feeds, but also impacts of dead birds, broken feathers, used beddings and other residual organic matters. This calls for a suitable arrangement to take care of this challenge, such that exposure of accumulated unhygienic impact will not

contribute to ill health of the pen attendant. Usually, most common diseases in poultry houses from the aforementioned types of health hazard are air-borne whose contributing factors are; dust, aerosolized feed and feather. Problems of poultry house litter, bed dungs, feed residue and slaughter house refuse are the most common health and environmental hazards facing poultry workers. This is because dust particles or water droplets may contain bacteria / viruses which are agent of disease spread (infectious bronchitis / avian influenza) (Truscott *et al.*, 2007).

Provision of safety protective, regular hand washing/ sanitizing of hands after having contact with poultry and its compositions when practiced regularly can curb the spread of disease outbreak among poultry workers. Another factor that contributes to ill-health of poultry staffs also include the stocking density of the birds, which if not well care for can instigates the spread of diseases. This is because the dungs generate irritating chemicals such as hydrogen sulphide (H₂S), methane (CH₄) and ammonia (NH₃) (Cole *et al.*, 1999) which nauseates the care taker, irritates the eyes and also affect the chickens in the poultry. Extreme stock density of intensive production can influence the birds towards sores, ammonia burns on their skin (known as breast blisters), hook burns, food pad dermatitis (SCAHAW, 2000). These results to high concentration of aerial pollutants which result in increased respiratory disease to birds. Birds housed indoor (i.e. in an intensive closed system) are more susceptible to infectious disease due to poor air quality, accumulation of

pathogens in a restricted environment, lack of exposure to sunlight. These factors amount to decrease in bird's natural resistance to diseases (Sims, 2010).

Therefore with the level of exposure and risk to diseases in poultry environment, these calls for proper study to proffer solution to reduce the risk level if not total elimination in order to provide a disease-free environment to poultry workers. It is the aim of this work to identify the nature, causes of health impact and level of health risk among poultry workers and ways to eliminate or reduce the risk(s).

MATERIALS AND METHODS

The method adopted for the purpose of this study included, personal interview, observation and distribution of questionnaires. Questionnaire was designed and distributed to selected farms in order to generate information in different units of poultry house, such as pen house, laboratory, farm workshop (maintenance engineers), Administrative office. The farms visited included Tuns Farm Osogbo, Osun State), Zartech and Vina farms, Ibadan, Oyo State. A total of 100 questionnaires were administered cover the aforementioned units.

RESULTS

The farms visited housed their pens in confined structures, using deep litter production system. The workers, both male and female of various educational backgrounds and experience work in these farms. Table 1 shows the academic qualification of the workers.

Table 1: Academic Qualifications of Poultry Workers

Academic qualification	Number of workers	Percent
SSCE	41	43.6
Diploma	17	18.1
HND/BSc	36	38.3
Total	94	100%

Table 1 shows that 43.3% of the workers were senior secondary school certificate holders, 18.1% diploma and 38.3% first degree holders. The

percentage distribution of worker's responsibility (occupation) on the farm is as shown in Table 2.

Table 2: Workers Occupation (Responsibility) on the farm

Occupation (Responsibility)	No of Workers	Percent (%)
Pen attendants	40	40
Laboratory Scientist/ Supervisor	22	22
Engineers/ Maintenance officers	19	19
Non-Pen Workers	19	19
Total	100	100

From Table 2, 40% of the workers were pen attendants, 22% laboratory scientist / supervisor, 19% engineers/ maintenance officers and 19% were

non-pen workers who rarely go to the farm such as cashier, receptionist.

Table 3: Distribution of Ailments with Length of Service (Attendants)

Years of Working Experience	Frequency	Percent	CO, C, H	CO, C, ST	CO, C	C, H	H	C
0-2	8	20		37.50%	25.00%	12.50%		
2-5	18	45	33.33%	5.60%	11.10%	11.10%	16.70%	
5-10	13	32.5	15.40%		15.40%		53.80%	6.20%
10-15	1	2.5						

CO = cough, C = catarrh, H = headache and ST = sore throat

Table 4: Distribution of Ailments with Length of Service (Supervisor / Laboratory scientist – 22%)

Years of Working Experience	Frequency	Percent	CO, C, H	CO, C, ST	CO, C	C, H	C, GW	CO, C	ST	BP	C	H	F
0-2	6	27.3	-	-	-	16.70%	-	-	16.70%	-	66.70%	-	-
2-5	9	40.9	-	-	-	11.10%	-	-	-	11.10%	55.60%	22.20%	-
5-10	7	31.8	14.30%	14.30%	14.30%	14.30%	-	-	-	-	14.30%	14.30%	14.30%
10-15	-	-	-	-	-	-	-	-	-	-	-	-	-

Table5: Distribution of Ailments with Length of Service (Engineers / Maintenance / Technical Officer – 19%)

Years of Working Experience	Frequency	Percent	CO, C, H	CO, C, ST	CO, C, F	C, H	C, GW	CO, C	S T	BP	C	H	F	None
0-2	5	26.3	-	-	-	-	-	60.00%	-	-	-	40.00%	-	-
2-5	7	36.8	-	-	-	-	14.30%	-	-	-	14.30%	28.60%	-	14.30%
5-10	5	26.3	20.00%	14.30%	-	14.30 %	-	-	-	-	20.00%	20.00%	20.00%	-
10-15	2	10.5	50.00%	20.00%	-	-	-	-	-	-	-	50.00%	-	-

Table 6: Distribution of Ailments with Length of service (Others – 19%)

Years of Working Experience	Frequency	Percent	CO, C, H	CO, C, ST	CO, C, F	C, H	C, GW	CO, C	ST	C	H	CO	None
0-2	4	21.10	-	-	-	25.00%	-	-	25.00%	25.00%	25.00%	-	25.00%
2-5	7	36.80	28.60%	-	-	14.30%	-	14.30%	14.30%	14.30%	14.30%	-	-
5-10	6	31.60	16.70%	16.70%	-	-	-	16.70%	16.70%	16.70%	16.70%	-	-
10-15	2	10.50	-	-	-	50.00%	-	-	-	-	-	50.00%	-

DISCUSSION

The result shows that the most common diseases associated with the staffs of the visited farms were cholera, diarrhea, *E. coli*, salmonellosis, staphylococcus, headache due to exposure to high level of noise generated in the area, Avian flu, New castle diseases, zoonotic diseases and infectious diseases.

Methods used to prevent occurrences from various diseases associated to poultry workers are bird culling, administration of drug such as draziprim, bio-security, vaccines, the use of disinfectants and provision of safety protective equipment (SPE) to workers. The common chemicals used as disinfectant in production units include Virkon, formalin, lime, caustic soda and they are usually applied by spraying. This was done to reduce outbreak of spread is diseases within poultry confinement to the barest level. It was observed that the environment in the pen was dusty and stinking due to air- borne contaminants of organic poultry dust which comprises of skin debris, broken feathers, feeds, excreta among others. Exposure to these toxic and asphyxiating gases may affect the workers in acute / chronic dermal and other respiratory diseases (IHDOPFW, 2000).

It was observed from the survey that the pen attendants are more prone to infection than all other members of staff that worked on the farm. This may be due to the fact that they spend more time in feeding, caring for the birds and harvesting either eggs or preparing them for the slaughter house thereby making them to suffer from cough, catarrh, sore throat and breathing difficulty. This is as shown in Table 3, such that the early year workers (between 0-5 years) has high value of the stated infectious disease, while the rate decreased as they stayed longer (between 5-15 years). The reduction in the risk level with longer years of experience may be due to their adaptation to the poultry environment. The increase in the value recorded for those that suffer from headache may be due to high level of noise from operating equipment and birds. This report is in agreement with that of Morris (1991) which stated that industrial hygiene survey carried out in the chicken processing industry has

demonstrated that poultry confinement workers are exposed to high concentrations of respiratory hazards.

Results obtained shows that, out of a total of 40 attendants, those that have worked on the farm between 0-5 years are more prone to catarrh, cough, sore throat and headache. This may be due to longer hours spent working in the pen house, unavailability or negligence in the use of safety protective equipment (SPE) and high level of noise form birds and equipment which exposes them to the risk.

For the Supervisors / Laboratory Scientist, majority (55.60%) complained of catarrh especially those that have worked for between 2-5 years while, headache, catarrh and sore throat is rampant among those that have worked between 0-2 years. It was observed that cough, catarrh and headache are the common complaint of most members especially those that have spent between 0-2 years while remaining percentage complained of headache and cough.

The non-pen workers serve as the control to other staffs that worked in the farm who rarely visited the pen house. Incidence of infection is minimal among this group compared to others. From the overall results, it was observed that cough, breathing difficulty and unusual complaint (such as back, arm and head pains) are the most significant of the overall diseases that affected workers in the farm. This may be due to their exposure to different physical, chemical and biological hazards associated to the farm. Also, the result shows that pen attendant who stays longer hours in the pen house are more liable to infectious, respiratory disorder as compared to other units. Hence, chest related diseases (respiratory difficulty), head pains is the most common hazard associated to the farm workers that relate directly with the poultry birds (i.e. those that worked in the pen house- pen attendant). The healthcare unit in the poultry firm assisted in the interpretation of most of these findings and buttressed with the past medical records of members of staff.

CONCLUSIONS

Based on the survey, it can be inferred that pen attendants were more prone to chest and other related infections due to the following observations:

- i. Exposure to disinfectants used as fumigation are hazardous, hence contributes to ill-health
- ii. Dust, odour, and other respiratory issues has an impact with time on workers health
- iii. Noise from either birds or equipment (such as cooling fan) contribute to noise hazard, there by affecting the hearing organ of pen attendant who mostly stay in and around the pen house.

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