

## Neighbourhood Acceptability of Poultry Farms Located in Residential Areas in Nigerian Metropolis

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**Target Audience:** Poultry Farmers, Environmental Policy Makers

### Abstract

*This study was conducted to evaluate the environmental effect of poultry farms located among residents of some metropolitan town of Nigeria. Data were collected using structured questionnaires to interview 90 farmers and 270 residents in the neighbourhood of the poultry farms in the ratio 1:3 in each of the selected agro-ecological zones. The study was conducted in three agro-ecological zones in Nigeria. Sabon Gari Local Government of Kaduna State, Jos South Local Government of Plateau State and Ibadan Municipal Local Government of Oyo State were purposively chosen in the North West, North central and South West agro-ecological zones, respectively for the study because of high volume of poultry production enterprises in these locations. Questionnaires were administered to neighbours within 200 m<sup>2</sup> radius of poultry farms. Issues focused included: socio-economic characteristics of the respondents, level of acceptability of poultry production by the neighbours and environmental implication of poultry production. Descriptive statistics such as frequency counts and percentage were used to analyze the socio-economic characteristics of the respondents while Pearson correlation was used to establish the relationships between mode of waste disposal and neighbours' acceptability of poultry farm location in their neighbourhood. A large percentage (74.1%) of the residents found the activities of poultry production in their neighbourhood very repulsive. Air (64.4%), Noise (31.1%) and water (4.4%) pollution were indicated by the neighbours as the major problems encountered. Adoption of technologies that can keep poultry litters dry and odourless was low (24.4%) among poultry farmers. There was great discomfort experienced by residents due to poultry production in their neighbourhood. It was recommended that farmers should be encouraged to adopt technologies that can keep poultry litters dry and odourless. In addition, poultry farm locations should be sited far away from residential areas.*

**Keywords:** Poultry Farms, Acceptability, Waste management, Residents, Nigerian Metropolis

### **Description of Problem**

Poultry industry in Nigeria has recorded considerable expansion in recent times (1). This is due to increased demand for animal protein especially in the form of poultry products (meat and eggs). This has led to the establishment of poultry farms within major cities in the country. Many farms are located in the residential areas (2). The activity of these poultry farms in the residential areas has generated some nuisance effects in terms of environmental hazards such as noise, air and water pollution (3). Industrial poor air quality results from the localized release of significant quantities of toxic gases and odorous substances, as well as particulates and bio-aerosols containing a variety of microorganisms and human pathogens. An array of adverse human health effects have been documented in conjunction with the rise of industrial farm animal production (4). Health outcomes observed among farm workers and exposed residents in the neighbourhood include an increased prevalence in serious respiratory diseases (5), bacterial infections that may be resistant to antimicrobials, and a general decline in physical, mental, and social wellbeing, as perceived by affected resident (4,5,6). The study therefore was aimed at evaluating the environmental effect of citing poultry farms among residents of some metropolis in Nigeria.

### **Materials and Method**

The study was conducted in three agro-ecological zones in Nigeria. Sabon Gari Local Government Area of Kaduna State, Jos South Local Government Area of

Plateau State and Ibadan Municipal Local Government Area of Oyo State were purposively chosen in the North West, North central and South West zones, respectively for the study because of high volume of poultry production enterprises in these locations. Data were collected using ninety (90) structured questionnaires among farmers and two hundred and seventy (270) structured questionnaires among residents neighbouring poultry farms in the ratio 1:3 in each of the selected agro-ecological zones. Questionnaires were administered to neighbours within 200 m<sup>2</sup> radius to the poultry farms. Issues focused on were socio-economic characteristics of the respondents, level of acceptability of poultry production by the neighbours and environmental implication of poultry production. Descriptive statistics (frequency counts and percentages) were used to analyze the socio-economic characteristics of the respondents, poultry production parameters and level of acceptability of poultry production by the neighbours. Pearson correlation was used to establish the relationships between mode of waste disposal and neighbours' acceptability of poultry farm location in their neighbourhood.

### **Results and Discussion**

#### ***Socio-economic characteristics of poultry farmers***

The socio-economic characteristics of poultry farmers and their neighbouring residents are shown in Table 1. Majority of the respondents (poultry farmers 72.2%; neighbours 91.6%) were within

the active and economically enterprising age (20-50 years old). Most respondents (farmers 87.8%; neighbours 59.3%) were married. About 80% of the farmers and their neighbours had at least secondary education. They were also engaged in

some other primary occupation such as civil service, business and as artisans. The proportion of the farmers that engaged in poultry farming activities as their sole source of income was 41.1%.

**Table 1: Socio-economic characteristics of poultry farmers and their neighbours**

Variable	Poultry farmers (N = 90)		Neighbours (N = 270)	
	Frequency	Percent	Frequency	Percent
<b><i>Sex</i></b>				
Male	47	52.2	143	53.0
Female	43	47.8	127	47.0
<b><i>Age (Years)</i></b>				
20-30	7	7.8	116	43.0
31-40	31	34.4	72	26.7
41-50	27	30.0	59	21.9
51-60	19	21.1	12	4.4
61 and above	6	6.7	11	4.1
<b><i>Marital status</i></b>				
Single	8	8.9	94	34.2
Married	79	87.8	160	59.3
Widowed	3	3.3	12	1.5
Divorced	-		4	4.4
<b><i>Educational qualification</i></b>				
No formal education	4	4.4	23	8.5
Primary school	8	8.9	23	8.5
Secondary school	16	17.8	64	23.7
Post-secondary school	62	68.9	160	52.2
<b><i>Primary occupation</i></b>				
Civil servant	40	44.4	112	41.5
Business/Artisans	13	14.4	107	39.6
Farmers (Poultry farming)	37	41.1	-	-
Unemployed	-		51	18.9

***Poultry production parameters***

Poultry production parameters in the residential areas of Nigeria are shown in Table 2. Majority (58.9 %) of the farmers

acquired the land for their farms by purchase (58.9%). Thirty percent of the farmers had large (2001-10,000) and very large (above 10,000) chicken stocked and

73.3% had been in production for five or more years. Deep litter was the most favoured (70.0%) housing system. The farmers preferred deep litter system possibly because of cost implication of battery cages. This was in agreement with the report by (7) who stated that there was a trend for production to increase with stocking density on litter, but decrease in cages. However, the more

favoured housing system (deep litter) has the tendency to encourage accumulation of Green House Gases (GHG), carbon monoxide (CO), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) (8). The Standards Organization of Nigeria (SON) had said that most poultry farm operators in the country were not adhering to standards. The incidence had adversely affected public health in the country (9).

**Table 2: Poultry production parameters**

Variable	Frequency	Percent
<b><i>Source of land for poultry farms</i></b>		
Inheritance	16	17.8
Lease	18	20.0
Purchase	53	58.9
Gift	3	3.3
<b><i>Total flock size</i></b>		
Small (100-500)	31	34.4
Medium (501-2000)	32	35.6
Large (2001-10,000)	23	25.6
Very large (Above 10,000)	4	4.4
<b><i>Number of year in production</i></b>		
Less than 5	24	26.7
5-9	46	51.1
10-14	18	20.0
15-19	2	2.2
20 years and above	2	2.2
<b><i>Housing systems</i></b>		
Battery cage	1	1.1
Deep litter	63	70.0
Battery cage + Deep litter	26	28.9

***Duration of residency in the neighbourhood of poultry farms***

Table 3 shows the duration of residency and acceptability of poultry farm location by neighbours. Most (62.6%) of the

respondents indicated living in their neighbourhood for five or more years. The poultry farms were established before 63.7% of neighbours started living in the studied neighbourhoods. This is a

clear indication that most of our cities in Nigeria do not conform to town planning and layout (residential and industrial). Land in the same locations were mapped out and being sold indiscriminately for industrial/commercial and residential usage. In developing countries such as Nigeria, development in urban areas and miscellaneous land-use types were isolated in the fringe areas followed by gradual filling of intervening spaces with similar uses. This is mainly due to rapid

urbanization associated with growth in population size (10). Jos Metropolitan Development Board (11) had observed the practice of animal rearing around residential neighbourhoods across the residential zones with worse cases found in the high density zones. According to (12), livestock production is shifting geographically, first from rural areas to urban and peri-urban, closer to consumers, then towards the sources of animal feedstuff.

**Table 3: Duration of residency in the neighbourhood of poultry farms**

Variable	Frequency	Percent
<b><i>Duration of residency</i></b>		
Less than 5 years	101	37.4
6-15 years	116	43.0
16-25 years	39	14.4
Above 25 years	14	5.2
<b><i>Period of establishment/residency</i></b>		
Yes	172	63.7
No	98	36.3
<b><i>Acceptability of farm location to neighbours</i></b>		
Yes	69	26.6
No	201	74.4

***Poultry farmers’ perception and reactions to acceptability of their farms***

As shown in Table 4, 56.7% of the residents complained of stress due to their proximity to the poultry farmers at one time or the other. However, Ogulade *et al.* (14) reported that neighbours of livestock farms in Ilorin, Kwara State of Nigeria had ranked dustiness as the major source of stress in their households.

Thirty percent of the farmers studied expressed indifference to the plight of their neighbours while 28.9% showed some form of concerns but cannot relocate their farm from the neighbourhood. The concerned farmers might have been handicapped to relocate their farms from neighbourhood of residents because of economic reasons.

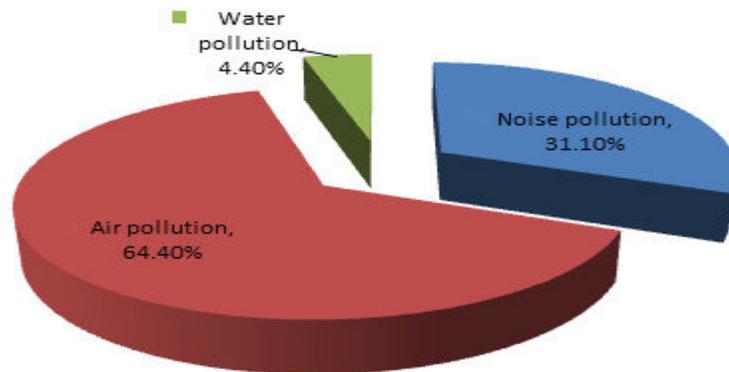
**Table 4: Poultry farmers’ perception of acceptability of their farms in residential areas**

Variable	Frequency	Percent
<b><i>Reactions of neighbours to poultry farms</i></b>		
Indifferent	39	43.3
Neighbours complain of stress	51	56.7
<b><i>Farmers’ response to their neighbours’ reaction</i></b>		
Indifferent	27	30.0
Concerned but cannot relocate the farm	26	28.9
Concerned and offered hope of relocating the farm	37	41.1

***Measure of discomfort by neighbours***

The farms and their production activities were not acceptable to 74.4% of their neighbours (Table 3) because of discomfort experienced through air pollution (64.4%), noise pollution (31.1%) and water pollution (4.4%) as shown in Figure 1. Emissions such as dust, odours and noise all have the

potentials to cause pollution and human health hazards or cause offence if contact is prolonged and exposure is excessive (2). Integrated Pollution Prevention and Control (13) stated that the point at which ‘pollution’ in the form of offence to the sense of smell occurs, is taken to be the point at which there is reasonable cause for annoyance.



**Figure 1: Causes of discomfort to neighbours of poultry farms**

***Bio-Security and waste management measures adopted by poultry farmers***

Foot bath (80%), human traffic control (67.8%), occasional fumigation (62.2) and spraying of vehicle tyres were some means of bio-security adopted by poultry farmers (Table 5). These bio-security

measures were necessary because there could be risk of spreading poultry diseases in livestock and human population due to close contact (15).

Very few farmers in this study however, adopted innovations/technologies that

can help in managing the enormous wastes generated through poultry production activities properly as shown in Table 5. Adoption of use of drugs to keep poultry litter dry and odourless was low (24.4%). These drugs are capable of reducing microbial activities thereby minimizing the amount of gases emitted from wastes generated. According to Aluko (16), livestock waste emits a total of 30 million tonnes of ammonia per annum. Ammonia is a highly polluting gas with pungent smell that is capable of causing discomfort to neighbours that are in close proximity to the source of emission. Some of the gases generated from poultry wastes were reported (17) to influence climate change (17).

Table 5 also showed the various means through which poultry wastes and dead

birds were disposed by poultry farmers in the neighbourhoods studied. The wastes were majorly disposed in pits (61.1%), burnt (57.8%), used as manure for crops (51.1%) and sold (16.7%). There were cases where the wastes and dead birds were dumped in the nearest garbage heap (25.6%) and dumped into nearby water bodies such as rivers (7.8%). These practices are capable of degradation of environment through blockage of water ways which could possibly lead to flooding (18). Environmental degradation significantly affects human health, both directly and indirectly. Direct effects on human health include contact with pollutants. Indirect effects include increased exposure of humans and of animals to infectious diseases (1).

**Table 5: Bio-Security and Waste Disposal Measures Adopted by Poultry Farmers**

<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>
<b><i>Bio-Security Measures</i></b>		
Occasional fumigation	56	62.2
Foot bath	72	80.0
Spraying of vehicle tyres	12	13.3
Human traffic control	61	67.8
<b><i>Poultry waste management</i></b>		
Composting	16	17.8
Stored in stacked shed	9	10.0
Use of drugs to keep litter dry and odourless	22	24.4
<b><i>Means of disposal of poultry waste</i></b>		
In pits	55	61.1
Burning	52	57.8
Sales	15	16.7
Manure for crops	46	51.1
Dumped in the nearest garbage heap	23	25.6
Dumped into nearby water bodies	7	7.8

***Relationship between waste disposal and acceptability of poultry farm location in residential areas***

Table 6 shows correlation coefficients of relationships between means of waste disposal and acceptability of poultry farm location by neighbours. Poultry farms that use waste disposal methods such as deposit in pits (0.114;  $P>0.05$ ), sales (0.095;  $P>0.05$ ) and use as manure for crops (0.121;  $P>0.05$ ) recorded positive correlations which were not significant. Waste utilization for agriculture including poultry waste is not a new phenomenon in Africa but a traditional method of providing nutrients for plant,

enhancing soil quality and creating livelihood for farmers (19). On the other hand, the correlation coefficients obtained between neighbourhood acceptability of the farms location and burning (-0.164;  $P<0.01$ ), dumping of wastes on the nearest garbage heap (-0.223;  $P<0.01$ ) and dumped into nearby water bodies (-0.14;  $P<0.05$ ) were negative and significant. The neighbours in this study tend to reject poultry farms that use environmental unfriendly means of waste disposal such as burning, dumping in the nearest garbage and water bodies.

**Table 6: Correlation between observed mode of disposal of poultry waste and acceptability of poultry locations in the residential areas**

Mode of poultry waste disposal	Correlation coefficient
In pits	0.114 <sup>NS</sup>
Burning	- 0.164**
Sales	0.095 <sup>NS</sup>
Manure for crops	0.121 <sup>NS</sup>
Dumped in the nearest garbage heap	-0.223**
Dumped into nearby water bodies	-0.140*

(NS=not significant, \*\*  $P<0.01$  =highly significant, \*  $P<0.05$  = significant)

**Conclusion and Application**

1. There is a great discomfort experienced by neighbours due to poultry production in their neighbourhood.
2. Farmers should be encouraged to adopt technologies that can keep poultry litters dry and odourless.
3. Poultry farm locations should avoid residential areas.

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