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Assessment of Contaminants of Poultry Drinking Water in Eastern Nigeria

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Abstract

Drinking water quality has not been much appraised as quantity in poultry production. This study thus aimed at assessing the possible contamination in poultry drinking water sources and delivery systems. Most farmers (83%) adopted deep litter management system and majority used plastic drinkers (88.33%). Poultry house litter and faecal droppings became the major contaminants in water delivery systems, while algae, oil spillage and gas flaring were identified as most possible contaminants of sources as well as seepages and sewages disposed into water sources.

Keywords: Drinking water, poultry farms, contaminants, water sources

Introduction

Water is very important in poultry production as it is used for various activities in the farm including washing of utensil/equipment, as well as for administration of most drugs/vaccines. The aspect of poultry farming that require enormous amount of good quality water supply is for drinking for both birds and farm workers. Although most consideration in farms is often about the quantity of water available, little attention is made towards checking the quality of water supply to farms. But good quality water, especially for drinking, will enhance good health stock and farm workers. Earlier studies (Etuk *et al.*, 2011) in this region identified most predominant sources of water for poultry farms to include borehole/wells, river/streams, and rain water which is common in rainy season. Further studies (Etuk *et al.*, 2015; 2016) revealed the quality of these sources, and effect of using water from these sources on growth performance, carcass and blood physiology of broilers in the region. This work concentrates on investigating the common contaminants of poultry water supply in the region.

Materials and Methods

Questionnaire was administered to 300 willing and randomly selected poultry farmers during the rainy season of 2017 through Agricultural Extension Agents. The study region covers the entire 5 states of eastern Nigeria. Interpersonal interviews were also conducted to gather more information that was not structured into the questionnaire. Data obtained from the survey were subjected to descriptive statistics of frequency distribution, and proportions of respondents were expressed as percentages.

Results and discussion

Most farmers (83%) used deep litter system of management which may have been the reason many poultry farmers identified poultry litter as the major contaminants in poultry drinking water. Faecal droppings was also found to be a significant contaminant in many farms because about 83% of respondents used plastic drinkers and another 20% used aluminum drinkers which both are prone to contamination due to their openness. Farmers with birds on battery cage system do not used litter and hardly can droppings get into drinking water. Algae was identified in well water and in storage tanks as contaminants by 20.33% of respondents; while 16% of the farmers interviewed reported rust as contaminant mostly resulting from rusting pipes. Modern water equipments are designed with PVC pipes to avoid cases of rusting. Moreover, some respondents interviewed agreed that oil spillage in rivers/streams, waste disposed and sewage channeled into such bodies of water did constitute a level of contamination. Another contaminant identified was gas flared into the atmosphere which can contaminate rain water, and subsequently other sources of farm drinking water. Seepage from dump sites close to rivers, chemicals from fertilized farmlands as well as residues of pesticides and herbicides could be a source of contamination of surface water supply to farm, in addition to seepage from graveyards and soak away near boreholes in farm.

Conclusion

Proper management practices can help to reduce contamination such as lifting drinkers above litter level, drilling of borehole in a safer place and adopting adequate water treatment procedures in farms.

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Table 1: Result of survey of poultry farm water contamination in Eastern Nigeria

Variables	Class	Respondents	Percentage
A. Type of business	Broilers	205	68.33
	Cockerels	67	22.33
	Ducks	21	7.00
	Geese	3	1.00
	Guinea fowl	11	3.67
	Layers	108	36.00
	Quails	16	5.33
B. Flock size	1 – 100	19	6.33
	101 – 200	63	21.00
	201 – 500	173	57.67
	501 – 1000	32	10.67
	Above 1000	13	4.33
C. Management system	Deep Litter	250	83
	Battery Cage	30	10
	Both	30	10
D. Water sources used	Rain	149	49.67
	Borehole	270	90.00
	Pipe-borne	57	19.00
	Well	14	4.67
	River/stream	29	9.67
E. Delivery systems	Automatic nipples	16	5.33
	Manual nipples	22	7.33
	Plastic drinkers	265	88.33
	Aluminum drinkers	61	20.33
F. Water supply rate	Once daily	27	9.00
	Twice daily	106	35.33
	Thrice daily	84	28.00
	<i>Ad libitum</i>	30	10.00
G. Contaminants of water	Poultry litter	255	85.00
	Kerosene	14	4.67
	Rust	48	16.00
	Algae	61	20.33
	Faecal droppings	204	68.00
H. Contamination control	Washing of tank	67	22.00
	Flushing pipes	11	3.67
	Daily washing of drinkers	258	86.00
	Use of bottles on drinkers	55	18.33