



An overview of poultry and livestock waste management practices in Ogun State, Nigeria

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Abstract

A structured, pre-tested and peer-reviewed questionnaire was used for collecting data pertaining to location, stock type and density, husbandry methods, feed sources, water sources for farm use and waste disposal methods, from 19 farms situated in 4 local government areas of Ogun State, Nigeria. Of the farms 58% practiced mixed animal husbandry consisting of poultry birds, large and small ruminants, swine, rabbits and fish, while the remainder (42%) raised only chickens. The results also showed that 26% of the farms sun-dried and burned animal manure, 21% converted animal wastes into slurry that was flushed into nearby streams and rivers, 37% used the wastes as manure on farmlands or dumped them in bushes, garbage sites or open wastelands, while 16% of the farms practiced a combination of all these methods. It is concluded that animal waste management by poultry farmers in the state is inefficient, implying inadequate awareness of the potential negative impact of poor handling of animal wastes in the environment. There is a need for further studies to assess the magnitude of the risk posed to the environment, livestock and human health by poor animal waste management practices in the area.

Key words: Animal wastes, environment, management practices, public health.

Introduction

Studies have indicated that intensive animal husbandry can lead to the accumulation of animal wastes within relatively small geographical areas^{3,8}. These livestock wastes, consisting of very high levels of nitrogen, phosphorus and other toxic materials, constitute serious environmental threats, through nutrient losses from farms to the environment⁶. Though some studies portray the impact of intensive animal husbandry on the ecosystem as being largely beneficial^{1,7}, there is evidence of harmful effects such as the emission of methane and the release of toxic metal leachates into the surroundings of livestock operations from manure and compost².

The nutrients excreted in livestock feces are from the feed, though a small proportion is of endogenous origin. Among those elements found in animal wastes, nitrogen (N), phosphorus (P), potassium (K) and the heavy metals cadmium (Cd) and lead (Pb) are of social and public health concern because they pollute the air, soil and water. Nitrogen contributes to soil and water pollution as nitrate (NO₃⁻) and to that of air as ammonia (NH₃), while K accumulation in soil by manure application damages the health of cattle that graze those lands¹¹.

Fecal phosphorus and environmental pollution: About 50-70% of the total P in concentrates such as the common cereal grains and oil seed meals and their by-products is in phytate form (myo-inositol 1, 2, 3, 4, 5, 6 hexa kis dihydrogen phosphate)⁹ and monogastrics like poultry and swine are raised on these feed materials. Phytate P is only partially available for absorption by

monogastrics as these species lack the phytase enzyme and have high levels of fecal P¹³. Application of livestock manure to farmlands may lead to P build up in soils because manure is often applied to meet the N needs of crops. The P to N ratio in manure is about twice that required by crops and excess P is released into the environment as run-off¹⁴ or can be independent of erosion⁴. Excess P in run-off is associated with pollution of surface water and the overgrowth of algae populations.

In Nigeria, the ban on the importation of poultry products has led to a dramatic growth of poultry farming and a more than 10-fold rise in the production rate of the industry⁵. It was the aim of this study to identify the waste management methods used by poultry and livestock farmers in Ogun State, Nigeria.

Materials and Methods

The study area: Ogun State is situated in the southwest geopolitical zone of Nigeria. It lies entirely in the tropics between Latitude 6.2°N and 7.8°N and Longitude 3.0°E and 5.0°E of the Greenwich Meridian, and covers a land area of 16,409.26 square km. The state shares contiguous internal boundaries with Lagos State to the south, Osun and Oyo States to the north and Ondo State to the east, while westwards it presents a common international border with the Republic of Benin (Fig. 1). The population estimates were 3,108,724 for 2001 and 3,496,179 for 2005¹⁰. The vegetational zones in the state range from fresh and marine water coastlands to thick rainforests and deciduous zones.

In Nigeria, Ogun State continues to be in the fore-front of



Figure 1. Map of Nigeria showing the location of Ogun State (shaded).

commercial poultry farming, involving huge enterprises and many household farms, raising birds for meat and eggs. The relative ease with which large poultry flocks can be raised in confinement, coupled with the dearth of vast tracts of cheap land in the south-west of Nigeria, are the likely factors that have tilted the preference of farmers in Ogun State to poultry farming.

Data collection and analysis: A structured, pre-tested and peer-reviewed questionnaire was used for collecting data pertaining to farm location, stock type, stocking density, husbandry methods, feed sources, water sources for farm use and waste disposal methods, from nineteen commercial poultry farms, situated in four local government areas of Ogun State. Data analysis was by the use of descriptive statistics.

Results and Discussion

Farm sizes and husbandry methods: More than half (58%) of the farms practiced mixed animal husbandry consisting of poultry birds, cattle, sheep and goat, swine, rabbit and fish, while 42% reared only chickens (Table 1).

Table 1. The results of a survey of farm animals reared in parts of Ogun State, Nigeria.

Animals reared	Number of farms	Proportion (%)
Poultry (chickens only)	8	42
Mixed (chickens, turkey, cattle, sheep, goats, swine, rabbits and fish)	11	58
Total	19	100

All the farms practiced intensive poultry husbandry and flock sizes varied from 200 to 4,000 birds, with the mean and modal flock sizes being 1,360 and 1,000 chickens, respectively (Table 2). According to a classification of poultry farms based on flock

Table 2. Summary data describing poultry operations in Ogun State, Nigeria.

Description	Number of chickens
Total sample size	25,850
Minimum flock size per farm	200
Maximum flock size per farm	4000
Range	3,800
Mean	1360
Mode	1000
Standard deviation	1173

sizes¹², 68% of the farms were small scale-farms with 1,000 or less birds, while the remainder comprised medium-scale operations with 1,001- 4,999 birds.

Waste disposal methods: The results of this study revealed that the use of animal wastes as manure on farmlands or outright dumping in bushes, garbage sites or open wastelands were the most common waste disposal methods practiced by commercial poultry and livestock farmers in the Ogun State. In all, 37% of the farms that were sampled disposed animal wastes in these ways. Out of the remaining farms, 26% sun-dried and burned animal wastes, 21% flushed such wastes as slurry into nearby streams and rivers, while 16% used a combination of all the three methods (Table 3, Fig. 2). These results showed that none of the farms has an environmentally friendly animal waste management system and the implication is widespread air, water and land pollution.

Table 3. Methods of animal waste disposal by farms in Ogun State.

Waste management method	No. of farms involved	Proportion (%)
Dumping in bushes and on farmlands	7	37
Sun-drying and burning	5	26
Flushing into streams and rivers	4	21
Combination of all the above methods	3	16
Total	19	100

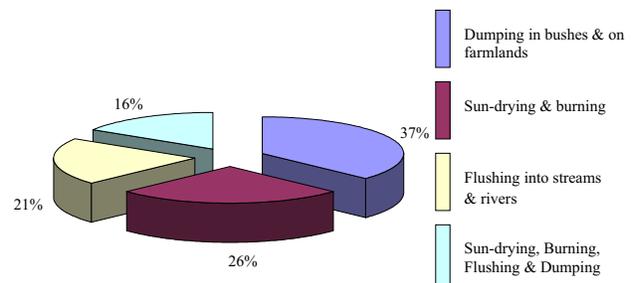


Figure 2. Poultry and livestock waste management practices in Ogun State, Nigeria.

Conclusions and Recommendations

This study showed that there is poor management of poultry and livestock wastes in Ogun State, Nigeria. The disposal methods in practice may bear grave implications for the environment, livestock and public health and there is an obvious need for impact assessment studies that quantify the magnitude of these risks. There should be strict enforcement by supervisory agencies of existing policies aimed at environmental preservation and the protection of water quality. Alternative methods for the utilization of animal wastes in the area should be considered by stakeholders, though the popular adoption of any technology would depend on cost considerations, access to subsidies, and the potentials the technology has for yielding profit. Avenues to educate livestock farmers and feed manufacturers on nutrition management must be sought, as this is a viable tool for the reduction of the nutrient load (particularly that of P) of run-off water from manure dumps sites and upstream farms.

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