An Assessment of Poultry Husbandry by selected Farmers in the Greater Accra area

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ABSTRACT

To ensure food security, constraints to improved animal production must be identified and addressed. This study assessed poultry husbandry practices focusing on housing design, stocking density, feeding, biosecurity and waste management among selected farmers in the Greater Accra region. A structured questionnaire was administered to 100 farmers across seven districts. Most farmers used intensive housing systems, with pens primarily oriented east-west, though only one-third adhered to recommended sidewall heights of 0.3 – 0.5 m. A major concern was widespread overstocking, with some farms exceeding recommended densities by up to 200%, often accompanied by poor litter conditions. Feeding practices were relatively good as most farmers fed birds twice daily using commercial feeds based on maize and fish meal. While awareness of biosecurity was high, implementation was inconsistent. Although 84% had isolation pens and 70.6% restricted vehicle access, only 14% controlled human entry and just 11.8% implemented clean/dirty zone separation. Footbaths were present on only 43.5% of farms and often incorrectly sited. Waste management was largely traditional as 48% used untreated manure, 39% burned waste and only 15% composted. These deficiencies may stem from limited technical knowledge and financial constraints. The study recommends regular training and support to improve housing, biosecurity and waste management practices to enhance bird welfare, productivity and reduce reliance on imported poultry.

Keywords: Biosecurity, housing design, feeding practices, overstocking, stocking density

1.0 INTRODUCTION

With the global population rising, ensuring sustainable food supply is increasingly critical (Steinfeld et al., 2006). Demand for animal protein continues to outpace supply, particularly in developing regions (Kim et al., 2018). Enhancing livestock productivity, especially poultry, is vital for food and nutritional security (Dayoub et al., 2024). Poultry, particularly chickens, offer health advantages over red meat due to lower fat and higher protein content (Jilo and Hasan, 2022). They are also ideal for low-income households, providing fresh meat and eggs without the need for refrigeration (Wong et al., 2017). Additionally, poultry farming has a lower environmental footprint compared to ruminants (Pius et al., 2021). Despite these benefits, Ghana imports about 75% of its poultry demand (Knößlsdorfer & Qaim, 2023), largely due to inefficiencies in local production. Key constraints include high feed costs (accounting for 50 – 70% of expenses), disease outbreaks, poor veterinary access, weak marketing and substandard husbandry practices (Aboah et al., 2025). While interventions like vaccines and improved feed formulations have been studied (Abdallah et al., 2023), there remains a gap in understanding on-farm management practices in the Greater Accra region.

This study evaluates current poultry husbandry practices in selected districts of the Greater Accra region, focusing on housing, feeding, biosecurity and waste management. The findings aim to inform policy and extension services to improve productivity, bird welfare and local self-sufficiency in poultry production.

2.0 MATERIALS AND METHODS

The study was conducted in seven districts within the Greater Accra region namely, Ga West, Ga East, Ga South, Ga Central, Accra Metropolis, Ablekuma West and Adenta Municipal. A total of 100 poultry farmers who consented to participate were surveyed using a structured questionnaire.

The questionnaire collected data on socio-demographics (gender, age, education), housing systems (design, orientation, ventilation, floor type, litter), stocking density, feeding practices (feed sources, ingredients, feeding frequency), biosecurity measures (isolation, access control, disinfection) and waste management. Data was analysed using descriptive statistics. Responses were grouped into three thematic areas: housing (30 respondents), feeding (30 respondents) and biosecurity (40 respondents), allowing for gender and educational analysis within each domain.

3.0 RESULTS AND DISCUSSION

3.1 Characteristics of Respondents

Of the 100 respondents, 71 were males and 29 females, indicating male dominance in poultry farming in the region. Male participation was highest in housing (80%) and feeding (66.7%), while biosecurity had a relatively higher female representation (32.5%). Educational levels varied among the respondents of this study. A majority (57%) had secondary education, 29% tertiary, 12% basic and 2% no formal education. In feeding and housing, no respondents lacked formal education, suggesting these areas require basic literacy. With respect to biosecurity, 85% of those involved had at least secondary level of education. The relatively high education level implies that knowledge transfer through training could be effective.

3.2 Housing Design and Management

Ninety percent of farmers used intensive systems, 5% semi-intensive and 5% extensive. This aligns with urban and peri-urban trends where space is limited and disease control is a priority (Roessler et al., 2016). Most (67%) poultry houses were oriented to the east-west direction and this minimises direct solar radiation on sidewalls and reduces heat stress on the birds (Oloyo & Ojerinde, 2019). However, 33% had north-south orientations, which may increase heat exposure during midday, potentially compromising bird comfort and productivity.

Eighty-four percent of houses were used for both brooding and rearing, indicating multi-purpose use due to cost constraints (Rushton et al., 1995). Some farmers converted residential buildings into makeshift pens (Plate 1), which may compromise ventilation, drainage and hygiene in the pens.

Only 29% of farms had sidewalls of the recommended height of 0.3m – 0.5m. Low sidewalls are critical for adequate airflow while protecting birds from rain and predators. Poor sidewall design can lead to poor ventilation, increased humidity and heat stress. One of such improvised pens is provided below (Plate 1). Most poultry houses had single-sloped shed roofs, which is simple, inexpensive and durable with aluminum sheeting roofs which are durable and cost effective (FAO, 2022). Concrete floors were used by 97% of respondents, with only 3% using wooden planks. Concrete is preferred because it is durable, easy to clean and prevents burrowing pests and predators from accessing the birds. Wood shavings were universally used as litter material. Diarra et al. (2021) recommend wood shavings as litter material because they are inexpensive, absorbent and provide good thermal insulation. All respondents relied on natural ventilation systems. While natural ventilation is cost-effective and easy to install, its efficiency depends heavily on housing orientation and wall design.

Plate 1: Makeshift Poultry pen in use

3.3 Stocking Density and Overstocking

Overstocking was a major issue in this study. Many farms exceeded recommended space allowances by up to 200%. Table 1 outlines standard space requirements for broilers and layers. For example, 1,000 broilers require 100m² (10m × 10m or 5m × 20m), but some farmers housed this number in half that space. Overstocking leads to stress, aggression, poor air quality and increased disease transmission (Ansah, 2022). Plate 2 illustrates severe overcrowding, with birds unable to move freely. This contradicts findings in Cameroon, where some farmers understocked to improve performance (Ndogmi, 2017), suggesting economic pressure drives overstocking in Accra.

Temperatures in 35% of farms ranged from 31°C to 32°C and 15% exceeded 33°C, well above the thermoneutral zone of 20 – 25°C for poultry. Only 5% of the respondents maintained inside pen temperatures below 26°C. High temperatures, combined with poor ventilation and overcrowding, increase the risk of heat stress, manifested by panting, reduced feed intake and decreased egg production (Gbedemah et al., 2018) in layers and reduced growth rate for meat type birds. Most farmers lacked knowledge of these signs and its implications on the welfare status of their birds.

Plate 2: Birds grossly overstocked in a poorly designed pen

3.4 Feeding Practices in Use

Among the 30 farmers, fish meal emerged as the most commonly used protein source, adopted by 14 farmers, which represents 46.67% of the respondents. This was followed by soybean meal, used by 10 farmers, accounting for 33.33%. Palm kernel cake (PKC) was used by only one farmer (3.33%), while other protein sources such as groundnut cake and copra cake were reported by five farmers, making up 16.67% of the group. In terms of calcium in the ration, oyster shell was the most frequently used source, reported by 23 farmers, making up exactly half of the total (50%). Eggshells were the second most popular choice, used by 11 farmers (36.67%). Limestone and other calcium sources were each used by three farmers, representing 3.33% and 10% respectively.

Among the sources of calcium, limestone is believed to be cheap, relatively difficult to adulterate and widely used source of calcium in poultry diets. Oyster shell is particularly valuable for layers due to their coarse, slow-release nature that matches the bird's requirement for eggshell formation. Besides, eggshells can be a good supplemental source of calcium but must be used with caution. To avoid the spread of infections, eggshells must be properly sterilised and processed before incorporation. However, the use of eggshells is not practical as the main source for large flocks due to the large quantities required. The most dominant fibre source among the farmers was wheat bran, used by 76.67% of the farmers contacted. Maize bran was used by 13.33, while rice bran was utilised by 10%. This indicates a strong preference for wheat bran as the primary fibre ingredient in feed formulation. For vitamin supplementation, premixes were overwhelmingly

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the most used option, with 26 farmers (86.67%) relying on them.

Only four farmers (13.33%) reported using other unspecified vitamin sources. In summary, the feed formulation practices among the 30 farmers surveyed showed a clear preference for fish meal and soybean meal as protein sources, oyster shell as a calcium source, wheat bran for fibre and premixes for vitamins. These ingredients were used either individually or in combination to meet the nutritional needs of their birds. Rice bran is rich in protein and oil but prone to rancidity due to its high fat content of about 5.9% (wheat bran has 4% crude fat content), has a high phytate content, contains a trypsin inhibitor and its high fibre (mostly lignin) content of 13% (wheat bran has 10% fibre) (Gallinger et al., 2004). These characteristics have limited the use of rice bran in poultry diets coupled with the fact it is very prone to adulteration with rice husk, sawdust, sand or any other bulking material. Therefore, the general rule of thumb is that use rice bran only when you trust the source and to reduce the possibility of feed going rancid, dry it as much as possible and compound manageable feed quantities to avoid storing feed beyond two weeks. A maximum of 10 – 20% inclusion rate of rice bran is recommended in broiler diets, depending on the geographical origin of the rice and the level of exogenous enzymes used (Martin and Farrell, 1998).

As recommended, the farmers increased the feed ration as the birds reached their peak laying period, which typically began from week 90 onward. At this stage, the birds were provided with an average of 235 grammes of feed per day. This daily ration was likely formulated to meet the increased nutritional demands of the birds during the peak laying phase, ensuring optimal productivity and health.

Table 1: Recommended space requirements for chicken broilers and layers

Broilers	Layers	Area required (m^2)	Width (m)	Length (m)
500	250	50	5	10
1000	500	100	5	20
1500	750	150	10	15
2000	1000	200	10	20
2500	1250	250	10	25
3000	1500	300	10	30
5000	2500	500	10	50
7500	3750	750	10	75
10000	5000	1000	10	100

(Easy Coops, n.d.)

The width and length columns of the table are suggested dimensions for a pen in order to achieve the recommendation space.

3.5 Biosecurity Measures in Use

The majority of poultry farmers demonstrated strong performance in implementing conceptual biosecurity measures. Specifically, 88.2% of poultry farms were physically isolated, which aligns with recommendations by Torremorell et al. (2022), who emphasised that farm location significantly influences disease risk due to the potential for airborne transmission. Similarly, 70.6% of poultry farms limit vehicle access, a practice that helps reduce the risk of disease introduction via contaminated tyres and vehicle surfaces (Manuja, Manuja and Singh, 2014; Alarcón et al., 2021). However, a major weakness was observed in restricting access by non-farm personnel. Only 14% of poultry farmers enforced this measure, indicating poor compliance with a critical biosecurity barrier. This finding is consistent with Shaban et al. (2022), who also reported low adherence to visitor control practices. Shaban et al. (2022) had previously assessed pig farmers' knowledge about the influenza virus and their adoption of biosecurity measures in the Greater Accra region of Ghana. As suggested by FAO (2010), effective control can be achieved through perimeter fencing, designated entry points and maintaining a visitor logbook. These practices were largely absent on the surveyed farms.

In terms of structural biosecurity, 84% of farmers had isolation pens, which are used to quarantine new or sick animals before integration into the main flock. This practice is in line with FAO (2010) guidelines, which recommend quarantine as a key preventive strategy to reduce disease transmission within farms. Equipment sharing was common, with approximately 50% of farmers sharing tools such as feeders and drinkers between farms. This poses a significant biosecurity risk, particularly if equipment is not cleaned and disinfected between uses.

Only 11.8% of poultry farms had an indicated or imaginary line of separation between clean and dirty zones on the farm premises. This low adoption rate reflects a lack of physical zoning, a recommended practice by FAO (2010) to minimise pathogen movement within farms. The absence of such separation increases the risk of cross-contamination, especially in farms without strict operational protocols. Operational biosecurity practices among poultry farmers showed variable levels of compliance. While 87% of poultry farmers used isolation pens to quarantine new or sick animals, indicating strong adherence to this key measure, this aligns with recommendations by Bojkovski (2015), who emphasises quarantine as a critical step in preventing disease spread. However, compliance with other operational measures was only average. Specifically, only 52.2% of poultry farmers regularly disinfect their tools and equipment, despite the fact that proper cleaning and disinfection are essential for reducing pathogen transmission within and between production areas (Manuja, Manuja and Singh, 2014).

Just 43.5% of poultry farms had functional footbaths, a surprisingly low figure given their recognised role in minimising the risk of disease introduction through footwear. The finding is consistent with the study's observation that many farmers lack basic infrastructure for biosecurity. Some farmers wrongly sited their footbaths some distance away from the entrance of the pen. This renders the whole disinfectant footbath ineffective because some pathogens can be picked up after using the footbath. It is recommended that footbath is sited right at the entrance of the pen. The wrongly sited and correctly sited footbaths are outlined below. On a more positive note, 62.2% of poultry farmers reported changing footwear and personal clothing before entering the farm premises. While this reflects relatively better compliance compared to footbath usage, it still indicates that nearly four in ten farmers do not follow this basic hygiene protocol. These results are consistent with Shaban et al. (2022), who also found inconsistent implementation of operational biosecurity practices among pig farmers in the Greater Accra area. The low compliance may stem from financial constraints, such as the high cost of disinfectants, protective clothing, boots and face masks, as well as poor worker discipline, where employees fail to consistently follow farm biosecurity protocols.

An overwhelming 82% of poultry farmers sourced their stock from hatcheries, which is a good practice from a biosecurity standpoint. Hatchery-sourced birds are typically vaccinated and raised under controlled conditions, significantly reducing the risk of introducing infectious diseases onto farms. The remaining 18% obtained stock from other sources, including fellow farmers or unconventional hatcheries. Sourcing day old chicks from other farms increases the risk of disease introduction, especially when the health status and biosecurity practices of the source farm are unknown.

Wrongly sited footbath

Correctly sited footbath

3.6 Waste Management Practices

Waste disposal methods were largely inadequate. 48% used poultry waste as raw manure. While beneficial for soil fertility, untreated manure can harbour pathogens such as Salmonella species, *E.*

coli) and attract pests (Nachman et al., 2005). 39% burned waste on-site. This is low-cost but environmentally harmful and may not fully eliminate pathogens unless high temperatures are sustained (Zhang, 2015). Only 15% composted their waste, a safer, sustainable method that reduce pathogens and odour. Despite poor disposal methods, 80% of farmers used separate tools for feeding and waste handling, preventing cross-contamination and this constitutes a positive operational practice and aligned with FAO (2010) recommendations. The low rate of adoption of composting as a waste management option is likely due to the lack of the required infrastructure, knowledge and capital. Training in simple composting techniques could improve environmental and biosecurity outcomes.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Poultry husbandry in the Greater Accra region is characterised by suboptimal housing, widespread overstocking, inconsistent biosecurity and poor waste management practices. While feeding practices are generally acceptable, there is room for improvement. They demonstrate awareness of best practices but face financial and technical barriers to implementation. We therefore make the following recommendations:

1. Regular training workshops should be organised to educate farmers on proper housing design, stocking density, biosecurity protocols and composting techniques.
2. Government and NGOs should provide subsidies or low-interest loans to help farmers upgrade infrastructure (e.g., proper pens, footbaths, composting units).
3. Promote the use of perimeter fencing, visitor logs, clean/dirty zones and correctly sited footbaths. Encourage hatchery-sourced stock and discourage informal sourcing of day-old chicks.
4. Establish and strengthen local poultry farmer associations (e.g., GAPFA) to monitor practices, share knowledge and advocate for policy support.

Improving husbandry practices will enhance bird welfare, increase productivity, reduce disease outbreaks and decrease Ghana's reliance on imported poultry.

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