

Village Chicken Production and Management Practices in Barishal, Bangladesh

Prodip K. Sarkar and Farhana B. Zalat

ABSTRACT

Village chickens are an important source of income and protein for village people in Bangladesh, like in many other developing countries. Since the productivity of the chickens is low, their production might be improved through better management practices. In this regard, village chicken production and management practices were investigated to know the present status and its limitations. We selected 150 farmers from 3 Upazilas (Babuganj, Bakerganj, and Barishal Sadar) in the Barishal district and collected information in a structured questionnaire and through observations. The results show that the village chicken production system was extensive with a low amount of supplemental feed. 87.34% of farmers provided supplement feed to their chickens once or twice a day, while the rest of the farmers did not provide any supplement feed. All of the farmers had a poultry shelter to keep their chickens at night, but we found the shelters to be almost dirty. They were reluctant to clean the shelter, as only 14.67% of farmers cleaned the shelters once a month, while the others did not. Chickens of multiple age groups were kept in the same shelter without maintaining biosecurity. As a preventive measure, 58.67% of farmers vaccinated their chickens, primarily for Newcastle disease. They did not maintain a vaccination schedule. Only 15.33% and 4% of farmers practiced deworming and external parasite control, respectively. For the mating of chickens, the farmers did not select males and females. Though the village chickens seem to be reared and consumed by chicken owners, only 32.87% of chicken products were consumed by chicken owners, and the rest were sold at village markets. Under these circumstances, it can be stated that the low productivity of village chickens could be due to lack of adequate nutrition, unhealthy housing, disease outbreaks, unplanned mating, and improper management practices. The practices of dietary supplements, providing healthy housing, ensuring a vaccination schedule, mating with good partners, and good management practices could improve the productivity of village chickens in Bangladesh.

Keywords: feeding, housing, management practices, village chicken production.

I. INTRODUCTION

Poultry greatly contributes to the fulfillment of protein requirements as well as providing financial assistance to people all over the world. Chicken is the most popular among poultry species because of its versatility and multi-purpose use. Aside from commercial chicken production, chickens raised in village conditions play an important role in improving the lives of village people in many developing countries [1]. Usually, the villagers have been raising the village chickens traditionally, and it has become an integral part of their lives. These chickens are usually adapted to the local conditions and environment. They are even able to survive in hot environmental conditions, and they have good immune capacities [2]. Probably, the genetic makeup of village chickens is diversified, and they can fight against diseases [3]. But village chickens are not usually produced under commercial conditions, and their prospects in many countries are criticized due to their low productivity. However, because of the slow growth rate and low egg production, village chickens are commonly regarded as low

producers [4]. Despite their low productivity, they are considered an important tool for poverty reduction, village development, and women's empowerment in many countries [5].

It is advantageous for the producers that the village chicken is highly demanded due to the pleasant flavor and taste of the meat and eggs. In Bangladesh, the meat obtained from village chickens and a crossbreed named Sonali is sold for almost double the price of commercial broilers [6]. The eggs are also sold at higher prices, though the weight of the eggs from the commercial layer is comparatively high. Generally, women are engaged in village chicken production besides their other household activities. In that sense, no extra labor is required from outside sources. There is a possibility of getting benefits from producing village chickens if they are raised correctly [7]. Moreover, sources of village chicks are generally fulfilled through natural incubation at the household level, without dependency on electricity facilities [8]. The management practices of village chickens have been studied in several countries, especially in developing countries where they are reared

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enormously. But the village chicken is facing several challenges that lead to low productivity [9]. In Bangladesh, the researchers studied family poultry to identify reasons for low productivity. But the work is limited, especially in the coastal belt of Bangladesh, like the Barishal district. We need to know the existing village chicken management practices to find out the possible causes of low productivity. In this regard, we surveyed this research work in the Barishal district. This research may help in understanding the existing production and management practices in the Barishal district and identifying potential solutions to constraints.

II. MATERIALS AND METHODS

A. Data Collection

In our previous study, we investigated the natural incubation of village chickens in the Barishal district, Bangladesh, to know the incubation capacity of the chickens [10]. In the current study, we considered the same households to understand the production and management practices of village chickens. Briefly, the study was conducted in three Upazilas of the Barishal district in Bangladesh. We selected 150 farmers (50 farmers per Upazila) from three Upazilas, namely Babuganj, Bakerganj, and Barishal Sadar. A structured questionnaire was used, and the data were collected through direct interviews with respondents and keen observation at the household level.

B. Village Chicken Production and Management Practices

To learn about village chicken production and management practices, we collected information on various management practices related to the rearing, feeding, and housing of chickens. To learn how to prevent and control diseases, the respondents' usual practices were documented. For chicken breeding practices, we collected information on the selection of male and female chickens and mating systems. The marketing of poultry and poultry products was also monitored at the household level.

C. Data Analysis

The data were analyzed by IBM SPSS version 20. Descriptive statistics were performed between variables to determine the Chi-square value. The level of significance was declared at $P < 0.05$.

III. RESULTS AND DISCUSSION

A. Chicken Population

The flock composition of chickens in the studied area is presented in Fig. 1. The village chicken comprises chickens of various ages. There were chicks, pullets, cockerels, hens, and cocks in the flock. On average, a flock had 11 chicks, 1 cockerel, 2 pullets, 1 cock, and 5 hens, which constituted 20 chickens per flock. The dynamics of the village chicken flock vary, and it was reported to have 1 to 50 chickens per household [11]. In Bangladesh, the maximum number of households in villages practice village chicken, with a flock composition below 20 per household [12]. In the current

study, we selected farmers who practice natural incubation. Generally, they are somehow experienced in poultry rearing, so there is a possibility of having high numbers of chickens per flock per household. The ideal number of chickens per household from the point of view of profitability has yet to be fixed in village conditions. However, the flock size should not be increased above 20 to prevent disease outbreaks and minimize risk in Bangladesh [13].

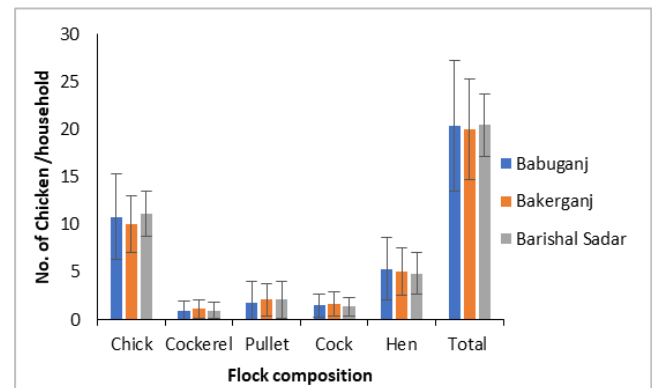


Fig. 1. Flock composition in the study area. The graph shows the result as the mean \pm standard deviation.

B. Rearing and Feeding Practices

Table I represents the rearing and feeding practices of village chickens. The village chicken production system was extensive. The farmers provided a small amount of supplemented feed on a daily basis. 87.34% of the farmers provided supplemental feed once or twice a day. Farmers also supplied a low amount of pellet feed (35.87%) purchased from the local markets. Representative images of chicken rearing and management practices are presented in Fig. 2. Some farmers (41.98%) made mixed feed with the available ingredients they had in their households or at the local market. The remaining farmers (22.14%) supplied grains like rice bran, broken rice, or kitchen waste. One of the advantages of this rearing system is that chickens collect feed from scavenging sources, lowering production costs. Due to low productivity and small flock sizes, the extensive system is most common in village conditions [5]. The availability of nutrients in scavenging conditions varies with seasons and locations. The farmers also feel the impact of the inadequate supply of feed for poultry production, as they get maximum production during the crop harvesting season in the locality. The average amount of feed consumed by chickens while scavenging has been reported to range between 45 grams per day during rainy seasons and 54 grams per day during dry seasons [14]. Chickens under scavenging conditions usually lack a sufficient amount of nutrients if they are not provided with supplemental feed [15]. They are especially deficient in nutrients like protein. A quantitative assessment of feed consumed during scavenging conditions and the daily requirement of feed and nutrients should be assessed first. Then, supplying the shortfall as supplementation might be beneficial for village chicken production.

TABLE I: REARING AND FEEDING PRACTICES OF VILLAGE CHICKENS

Variables (n=150)	Parameters	Frequency (%)				χ^2	P-value
		Babuganj	Bakerganj	Barishal Sadar	Overall		
Chicken production systems	Extensive	50 (100%)	50 (100%)	50 (100%)	150 (100%)		
	Semi-intensive	0 (0%)	0 (0%)	0 (0%)	0 (0%)		
	Intensive	0 (0%)	0 (0%)	0 (0%)	0 (0%)		
Feed supplements	Yes	39 (78%)	42 (84%)	50 (100%)	131 (87.34%)	11.691	0.003*
	No	11 (22%)	8 (16%)	0 (0%)	19 (12.67%)		
Feed form	Pellet	13 (33.3%)	12 (28.57%)	22 (44%)	47 (35.87%)	2.647	0.618
	Mixed/handmade	17 (43.5%)	19 (48.71%)	19 (38%)	55 (41.98%)		
	Grains/kitchen waste	9 (23.11%)	11 (22.71%)	9 (18%)	29 (22.14%)		

* $P < 0.05$.

TABLE II: HOUSING MANAGEMENT OF VILLAGE CHICKENS

Variables (n=150)	Parameters	Frequency (%)				χ^2	P-value
		Babuganj	Bakerganj	Barishal Sadar	Overall		
Poultry shelter	Present	50 (100%)	50 (100%)	50 (100%)	150 (100%)		
	Absent	0 (0%)	0 (0%)	0 (0%)	0 (0%)		
Shelter type	Thatched	15 (30)	22 (44)	11 (22)	48 (32%)	5.699	0.058
	Wooden	35 (70)	28 (56)	39 (78)	102 (68%)		
House cleaning	Weekly	0 (0%)	0 (0%)	0 (0%)	0 (0%)	6.499	0.039*
	Monthly	7 (14%)	3 (6%)	12 (24%)	22 (14.67%)		
	None	43 (86%)	47 (96%)	38 (76%)	128 (85.33%)		
Housing facility	Same age	0 (0%)	0 (0%)	0 (0%)	0 (0%)		
	Multi-age	50 (100%)	50 (100%)	50 (100%)	150 (100%)		

* $P < 0.05$.

C. Housing Practices

The housing practices of village chickens are presented in Table II. Every farmer had a poultry shelter to keep their birds safe at night. These shelters were usually made of local construction materials, such as bamboo, straw, corrugated sheet, wood, leaves, plastic, earth, etc. The thatched shelter accounted for 32% of house construction, and the wooden and concrete shelter accounted for 68%. The use of tin shed shelters made of wood and bamboo is common in Bangladeshi villages [16]. The height, length, and width of the houses were not suitable for chickens. Actually, the ventilation system of the houses was poor. Cleaning the shelter could be difficult at times due to its structure. The stocking density of chickens was also not maintained in the

shelter. 85.33% of farmers did not practice cleaning the shelter, and only 14.67% of farmers cleaned the shelter once a month. Multi-age chickens were kept in the same shelter, and the birds were not reared separately. Even multiple species of poultry were seen in the same shed. The house should be well constructed to protect chickens from adverse conditions and predators. The house should have an appropriate height, width, and length. Multi-age species and chickens should not be kept in the same house. The house should be disinfected and cleaned on a routine basis.



Fig. 2. Chicken rearing and management practices: (a) chickens are scavenging feed from outside sources; (b) broken rice feed supplementation; (c) hand-mixed chicken feed preparation; (d) feeding hand-mixed chicken feed; (e) a wooden chicken shelter; and (f) a concrete chicken shelter.

D. Prevention and Control of Diseases

Mortality is an important factor that affects the productivity and profitability of poultry [17]. Biosecurity, vaccination, medication, and proper management are important to prevent and control diseases in poultry. The management practices for prevention and control of diseases are presented in Table III. The farmers did not practice biosecurity tools in the same way that an intensive commercial flock does. Actually, in the existing village chicken production system, it is difficult to maintain strict biosecurity. The farmers need to be informed about the importance of biosecurity and encouraged to apply it where there is a chance of it being applicable. They can easily isolate sick birds from healthy birds and discourage them from rearing different poultry species together. Cleaning and disinfection of farm premises should be practiced routinely. As chickens are raised extensively, all farmers should be aware of biosecurity. The village chickens might be a potential source of pathogen reservoirs that can infect other farms [18]. In Bangladesh, the most frequently occurring poultry diseases reported in village conditions were Newcastle disease, fowl pox, and parasitic infections [19]. As a preventive measure, 58.67% of farmers vaccinated their chickens; the rest did not vaccinate. They administered BCRDV, RDV, and occasionally the fowl pox vaccine. Vaccines are not always available at the local livestock offices. They rarely dewormed (84.67%) their chickens, and 96% of farmers did not practice parasite control. In village chicken production, the loss of chicks and chickens due to predators is commonly compared to intensive production systems. The productivity and profitability of small-scale farming at the household level were improved with

management interventions [20]. To reduce mortality, the maintenance of a vaccination schedule and the application of strict biosecurity are required.

E. Mating Systems

The mating practices of village chickens are presented in Table IV. The mating system was natural. As the chickens were reared extensively, they had a chance to mate with partners of low quality. The farmers did not practice selecting eggs from good-quality hens to set them for incubation purposes. The mating ratio in the studied area was 1:3 (cock: hen). In Nigerian native chickens, the recommended ratio at village conditions was 1:9 (cock: hen) [21]. In the existing situations, the cocks might be higher than the hens. Selection and breeding are important for the improvement of animals. The farmers did not practice the selection of males and females, and they did not maintain any planned mating among chickens. The selection of good-quality males and females and their planned mating may improve village chicken productivity [12].

F. Marketing of Poultry and Poultry Products

The practices for marketing poultry and eggs from village chickens are presented in Table IV. The farm owners consumed 32.87% of the poultry meat and eggs produced in their household, and a large portion (62.67%) of their products were sold at the local market. Mainly females are engaged in village chicken production and marketing systems, and village chicken production is playing an important role in improving gender equality and women's empowerment in Bangladesh [22].

TABLE III: PREVENTION AND CONTROL OF DISEASES

Variables (n=150)	Parameters	Frequency (%)				χ^2	P-value
		Babuganj	Bakerganj	Barishal Sadar	Overall		
Maintain Biosecurity	Yes	0 (0%)	0 (0%)	0 (0%)	0 (0%)	6.983	0.030*
	No	50 (100%)	50 (100%)	50 (100%)	150 (100%)		
Practice vaccination	Yes	23 (46%)	29 (58%)	36 (72%)	88 (58.67%)	17.973	0.0001*
	No	27 (54%)	21 (42%)	14 (28%)	62 (41.33%)		
Practice deworming	Yes	16 (32%)	6 (12%)	1 (2%)	23 (15.33%)	1.042	0.594
	No	34 (68%)	44 (80%)	49 (98%)	127 (84.67%)		
External parasite control	Yes	2 (4%)	3 (6%)	1 (2%)	6 (4%)	1.042	0.594
	No	48 (96%)	47 (94%)	49 (98%)	144 (96%)		

* $P < 0.05$.

TABLE IV: MATING AND MARKETING OF CHICKEN

Variables (n=150)	Parameters	Frequency (%)				χ^2	P-value
		Babuganj	Bakerganj	Barishal Sadar	Overall		
Selection of male and female	Yes	0 (0%)	0 (0%)	0 (0%)	0 (0%)	6.864	0.143
	No	50 (100%)	50 (100%)	50 (100%)	150 (100%)		
Mating	Natural mating	50 (100%)	50 (100%)	50 (100%)	150 (100%)	6.864	0.143
	Artificial insemination	0 (0%)	0 (0%)	0 (0%)	0 (0%)		
Marketing of poultry and eggs	Own consumption	16 (32%)	12 (24%)	21 (42%)	49 (32.67%)	6.864	0.143
	Local market	30 (60%)	35 (70%)	29 (58%)	94 (62.67%)		
	Trader	4 (8%)	3 (6%)	0 (0%)	7 (4.67%)		

IV. CONCLUSIONS

The village chickens were raised extensively with a low amount of supplemental feed. All the farmers had a poultry shelter to keep chickens at night, but the shelter was almost dirty and not suitable for poultry production. The farmers

primarily vaccinated their chickens against Newcastle disease without maintaining a vaccination schedule, and few farmers practiced deworming and external parasite control. The farmers did not select males and females for a planned mating. The village chickens have the greatest potential because they usually get their feed from the surrounding areas, are less disease-prone, and are produced with little

investment. Although village chicken productivity is low, it can be increased through a well-balanced diet, healthy housing, planned mating, regular vaccination, and better management practices.

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COMPETING INTEREST

The authors declare no conflict of interest.

AUTHORS' CONTRIBUTION

Prodip Kumar Sarkar did the planning and design of the research work. He analyzed the data, prepared graphs, and tables, and wrote the manuscript. Farhana Binte Zalal collected the data at the household level. All the authors confirmed the data and the final manuscript.

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