

Article

## Management system and productivity of backyard poultry in Jhenidah district of Bangladesh: a survey

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**Abstract:** This study was carried out to know the current scenarios of rearing backyard poultry in Jhenidah district of Bangladesh. A total of 2832 poultry birds (deshi chicken, sonali, duck and pigeon) were selected from 170 households. The data were collected according to prepared questionnaire. The study revealed that, most of the farmers reared their poultry in semi scavenging system (97.64%). The poultry houses were commonly made of tin and bamboo (88.82%) and some of farmers kept their poultry in houses which were at unsatisfactory level (11.2%). They used polythene, sack, ash, sand, straw, papers separately or together as bedding materials (78.82%) and 21.18% of farmers did not use any bedding materials. They usually cleaned poultry house irregularly (73.53%). The rice (84.71%) as feed supplement followed by boiled rice, paddy, broken rice, wheat and commercial as well, was commonly given twice (62.9%) in a day. The farmers did not usually use feeder and waterer (44.12%) and use only 8.82% of vaccine. The supplementary feed to each deshi chicken, sonali, duck and pigeon per day were 32.77 g, 38.70 g, 82.04 g and 12.40 g gaining average body weight of 1.19 kg, 1.36 kg, 1.22 kg and 315.35 g respectively. The average egg production per deshi chicken, sonali, duck and pigeon per year were 37.27, 47.30, 84.66, and 19.90 containing average weight 35.01 g, 41.20 g, 52.68 g and 11.10 g successively. Furthermore, the mean hatchability was found 77.50% in deshi chicken, 79.25% in sonali, 78.95% in duck and 97.45% in pigeon along with 28.79% significant ( $P<0.05$ ) mortality in deshi chicken, 30.35% in sonali, 14.50% in duck and 11.40% in pigeon consecutively. The prevalence of diseases were investigated as Newcastle disease, fowl cholera, duck cholera, duck plague and pigeon pox. Diseases (54.1%) are the most current constraints followed by lack of knowledge, predators for poultry rearing in backyard system. This study will support farmers by enhancing their income through improved management practice in backyard poultry.

**Keywords:** backyard system; households; poultry; performance; management

### 1. Introduction

The poultry sector is now playing a potential role for poverty alleviation and young entrepreneurship development in Bangladesh. Livestock as sub sector of agriculture is the most viable sector in the economy of

Bangladesh. Backyard poultry farming is the traditional system of poultry rearing in rural area of Bangladesh which contributes in household economy and nutrition for their livelihood (Shanta *et al.*, 2017). Women rear the backyard poultry in rural household in Bangladesh and they get extra income with least labor and contribute to their family expenditure. Backyard poultry is mainly indigenous and some are crossbred reared with minimum facilities (Alam *et al.*, 2014).

The sources of feed for backyard poultry is the surrounding household wastage and food grains supplemented by the farmers (Sonaiya, 2007). Backyard poultry species in Bangladesh are mostly chicken, duck and pigeon. In addition to these, quail, goose, guine fowl and turkey are also reared sometimes by the farmers for their recreation (Alam *et al.*, 2014; Dolberg, 2008). The eggs and meat of the backyard poultry farming is mainly used for home consumption and the surplus are for income generation, particularly by the women who spend this money to support children's education and to mitigate family's financial gap in severe needs what help them to be empowered in the male-dominated rural families of Bangladesh (Islam *et al.*, 2017).

According to Das *et al.* (2008) and some other researchers, it is clear that backyard poultry meat and eggs are still highly demanded by the consumers even at premium prices. Scientifically, it has also been proved that free-range poultry meat and eggs are enriched with some valuable nutrients. For example, free-range egg contains 2-times higher omega-3 fatty acids, 3-times vitamin E and 7-times beta carotene than that of the similar size caged egg (Axe, 2016). Free-range eggs also been reported to supply 33% less cholesterol, 25% less saturated fat and 66% more vitamin A compared to equal size caged eggs (Axe, 2016). Other than eggs, the meat of free-range scavenging chicken has also been proved to be rich in taste and flavor (Islam *et al.*, 2002).

The indigenous chicken breeds/types existing in Bangladesh are non-descript Deshi, aseel (Sarail and Chittagong type), Naked Neck, Hilly, Yasine, Native Dwarf and Frizzled Plumage (Bhuiyan *et al.*, 2005; Das *et al.*, 2008). Currently, the F1 crossbred (named Sonali) produced through a planned breeding between Rhode Island Red (RIR) male and Fayoumi female are widely available in the country both at backyard and small-scale semi intensive rural farms (Dolberg, 2008). The common duck breeds reared under the backyard system in Bangladesh are Desi Black (Nageswari), Desi White and Sylhet Mete which constitutes 97-98% of total population (Islam *et al.*, 2015). Among the exotic breeds, Jinding, Khaki Campbell, Indian Runner and Muscovy are dominant. Other than the indigenous and exotic breeds, the crosses between indigenous and exotic breeds are also common in the backyard system along with the Muscovy duck in some areas (Bhuiyan, 2011; Pervin *et al.*, 2013).

For backyard chicken, no standard housing is provided. The common features of backyard poultry houses are less living spaces than the requirement, lack of fresh air and sufficient light. Farmers do not maintain standard feeding, drinking system and hygienic care for their backyard poultry (Islam *et al.*, 2015). Free range, semi scavenging and in some cases intensive rearing system of backyard poultry are presently very common feature in Bangladesh (Chowdhury, 2013). Backyard poultry flocks of Bangladesh suffers from some common species specific diseases which is one of the drawbacks for backyard poultry rearing (Alam *et al.*, 2014).

However, the rural farmers do not have much knowledge on different aspects of poultry management. Despite their importance indigenous breeds are under threat due to various factors such as changing production systems and indiscriminate crossbreeding (Besbes, 2009). There is limited sufficient systematic data on backyard poultry production. Now farmers need proper knowledge on rural poultry rearing to reach up to the mark of profitability. The study stated the present management and productivity status of backyard poultry available in Jhenidah District.

## 2. Materials and Methods

### 2.1. Location of the study area

The present study was conducted in sadar upazilla under Jhenidah district of Bangladesh. Seventeen villages and a total of 170 farmers/households containing ten households from each village were selected randomly. The study area was divided into four geographical location viz. North (Kashimpur, Rajdharpur, Chuadanga), South (Hazidanga, Kashimpur, Armukhi, Kulfadanga), East (Narikelbaria, Kurapara, Kolabonkhali, Miakundu, Baniabohu, Kastoshagra) and West (Protappur, Narayanpur, Potahati, Konejpur).

### 2.2. Category of population

Backyard poultry such as chicken, duck, pigeon and crossbred chicken sonali were considered as a target species. Sexually matured poultry were figured out. They were categorized as age, sex, breed, rearing, housing, feeding, hatchability etc.

### 2.3. Data collection

The data were collected by observing the poultry management systems and production using questionnaire form.

### 2.4. Statistical analysis

The data was systematically recorded, assembled in excel 2013 and analyzed using Graph Pad Prism 8 software. The results were expressed in frequency number, mean, standard deviation, *P* value and percentage.

## 3. Results and Discussion

### 3.1. Performance of productivity of deshi chicken

Deshi chickens were fed supplementary feed to each chicken per day was  $32.77 \pm 4.24$  g scoring average body weight  $1.19 \pm 0.10$  kg (Table 1). In the relation to this findings, Alam *et al.* (2014) reported 48.50 g supplemental feed/day for each chicken and 1.19 kg of adult body weight which supported this findings. This difference may be due to lack of proper knowledge and of insufficient money regarding feed supplementation for their chicken. This results were also in accordance with Islam *et al.* (2003). The average production of egg from each chicken per year was  $37.27 \pm 1.83$  containing average weight  $35.01 \pm 1.35$  g which were in line with the findings of Alam *et al.* (2014) who observed average production and weight of egg were 42 and 39.03 g respectively.

**Table 1. Production performance of deshi chicken reared in backyard system.**

| Variables                    | E Zone<br>(n=676) | W Zone<br>(n=348) | N Zone<br>(n=414) | S Zone<br>(n=336) | Total<br>(n=1774) | <i>P</i> value |        |
|------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|----------------|--------|
|                              | Mean<br>±SD       | Mean<br>±SD       | Mean<br>±SD       | Mean<br>±SD       | Mean<br>±SD       |                |        |
| Amount of feed/bird/day (gm) | 27.87<br>±11.79   | 36.57<br>±11.47   | 30.61<br>±13.07   | 36.04<br>±11.44   | 32.77<br>±4.24    | **0.0015       |        |
| Body wt (kg)                 | 1.05<br>±0.33     | 1.26<br>±1.12     | 1.27<br>±1.30     | 1.19<br>±1.15     | 1.19<br>±0.10     | 0.5479         |        |
| Egg/bird/yr                  | 36.95<br>±13.69   | 37.84<br>±9.94    | 34.95<br>±13.68   | 39.32<br>±12.29   | 37.27<br>±1.83    | 0.6617         |        |
| Egg weight<br>(gm)           | 34.54<br>±3.66    | 35.44<br>±3.03    | 33.45<br>±4.27    | 36.62<br>±4.02    | 35.01<br>±1.35    | 0.7602         |        |
| Hatchability (%)             | 72.13<br>±19.6    | 84.25<br>±10.07   | 75.13<br>±18.03   | 78.5<br>±16.46    | 77.50<br>±5.20    | 0.5044         |        |
| Diseases (%)                 | ND                | 34.4<br>±11.26    | 29.2<br>±12.4     | 43.8<br>±14.7     | 30<br>±11.07      | 34.35<br>±6.70 | 0.2653 |
|                              | Fowl<br>cholera   | 11.6<br>±3.20     | 8.6<br>±5.12      | 11<br>±7.24       | 8.2<br>±4.49      | 9.85<br>±1.70  | 0.6689 |
|                              | Others            | 31.43<br>±14.88   | 25.29<br>±11      | 34.33<br>±13.62   | 21.83<br>±14.16   | 28.22<br>±5.69 | 0.3674 |
| Mortality (%)                | 26.5<br>±11.15    | 26.5<br>±11.71    | 38.33<br>±12.52   | 23.83<br>±7.08    | 28.79<br>±6.48    | *0.0205        |        |

n= Number of deshi chicken, \*= Significant ( $p < 0.05$ )

Furthermore, a significant ( $P < 0.05$ ) mortality of  $28.79 \pm 6.48\%$  compared to the zones was investigated with  $77.50 \pm 5.20\%$  of mean hatchability in this study. Alam *et al.* (2014) reported in supporting the present findings, an average of 75.97% hatchability and mortality of 27.82%. Present result of chicken egg hatchability was lower than that of (Azharul *et al.*, 2005; Khatun *et al.*, 2005). Azharul *et al.* (2005) investigated that hatchability of broody hens under Bangladesh condition was 86.6%. Khatun *et al.* (2005) showed that the hatchability on fertile eggs ranged from 78.33 to 90.79% in different genotypes of native chicken. The mortality in this observation was higher than that of Ershad (2005) who mentioned that the mortality of deshi chicken was 14.5%. In this research, mostly prevalence diseases were investigated as Newcastle disease, fowl cholera where average prevalence were  $34.35 \pm 6.70$  and  $9.85 \pm 1.70$  respectively. This finding supported with that of (Alam *et al.*, 2014; Saha, 2003). They reported that the most prevalent disease of deshi chicken was New castle, followed by Fowl pox, fowl cholera, Coccidiosis, and other miscellaneous diseases.

### 3.2. Performance of productivity of sonali chicken

Average  $38.70 \pm 2.56$  g feed per day was supplied to each sonali chicken gaining average body weight of  $1.36 \pm 0.07$  kg (Table 2). In relation to this findings, FAO (2015) reported 1.6 kg of body weight in adult sonali chicken in semi scavenging system. Each chicken produced average of  $47.30 \pm 4.88$  eggs every year in which average weight was  $41.20 \pm 1.30$  gm. Jahan *et al.* (2015) agreed with this observation who reported 45.1 g of egg weight in case of sonali chicken.

**Table 2. Production performance of sonali chicken reared in backyard system.**

| Variables                    | E Zone<br>(n=118) | W Zone<br>(n=11) | N Zone<br>(n=7) | S Zone<br>(n=21) | Total<br>(n=157) | P value        |        |
|------------------------------|-------------------|------------------|-----------------|------------------|------------------|----------------|--------|
|                              | Mean<br>±SD       | Mean<br>±SD      | Mean<br>±SD     | Mean<br>±SD      | Mean<br>±SD      |                |        |
| Amount of feed/bird/day (gm) | 35.2<br>±7.95     | 38.6<br>±6.1     | 41.2<br>±9.41   | 39.8<br>±11.37   | 38.70<br>±2.56   | 0.746          |        |
| body wt (kg)                 | 1.26<br>±0.29     | 1.38<br>±0.31    | 1.36<br>±0.27   | 1.44<br>±0.27    | 1.360<br>±0.7    | 0.7979         |        |
| Egg/bird/yr                  | 42.8<br>±8.52     | 52.8<br>±12.81   | 43.6<br>±8.01   | 50<br>±7.74      | 47.30<br>±4.88   | 0.3028         |        |
| Egg weight (gm)              | 40.4<br>±4.82     | 42.2<br>±4.81    | 39.8<br>±3.63   | 42.4<br>±2.96    | 41.20<br>±1.30   | 0.6938         |        |
| Hatchability (%)             | 67.2<br>±16.35    | 76.2<br>±14.43   | 79.2<br>±15.09  | 94.4<br>±5.08    | 79.25<br>±11.31  | *0.0396        |        |
| Diseases (%)                 | ND                | 35.2<br>±7.09    | 35.8<br>±8.17   | 33.8<br>±4.20    | 38.4<br>±10.5    | 35.80<br>±1.93 | 0.823  |
|                              | Fowl cholera      | 12.6<br>±2.97    | 13<br>±4.18     | 12.4<br>±3.84    | 14.8<br>±4.5     | 13.20<br>±1.10 | 0.7607 |
|                              | Others            | 19.2<br>±8.13    | 19.6<br>±10.83  | 22.6<br>±12.62   | 20.6<br>±9.07    | 20.50<br>±1.52 | 0.9539 |
| Mortality (%)                | 29<br>±13.47      | 31.2<br>±16.96   | 26.6<br>±9.86   | 34.6<br>±7.9     | 30.35<br>±3.40   | 0.7774         |        |

n= Number of sonali chicken, \*= Significant ( $p < 0.05$ )

Significant ( $P < 0.05$ ) value with the zones of  $79.25 \pm 11.31\%$  hatchability was observed in this study. Hatchability of 88.9% was reported by Jahan *et al.* (2015) in sonali chicken. Newcastle disease ( $35.80 \pm 1.93\%$ ) and fowl cholera ( $13.20 \pm 1.10\%$ ) were mostly prevalent diseases with mortality  $30.35 \pm 3.40\%$  in this study area. FAO (2015) reported 5.7% mortality in sonali chicken which lower than that of this findings. The difference may be due to no vaccination of their chicken and others management shortfall. Talukdar *et al.* (2017) inclined with the present results who investigated common diseases in sonali chicken as Newcastle, fowl cholera, coccidiosis, mycoplasmosis.

### 3.3. Performance of productivity of duck

The supplementary feed was given to their each duck as an average  $82.04 \pm 14.36$  g every day. Moreover, average body weight of duck was  $1.22 \pm 0.19$  kg. The average egg production of each duck was  $84.66 \pm 11.76$  per year whereas  $52.68 \pm 5.94$  g of average egg weight was observed (Table 3). In this context, Alam *et al.* (2014) reported that average body weight gain in adult duck was 1.69 kg eating supplementary feed of 108 g per bird per day. They also stated that the number of average egg production per year per duck was 102.87 containing average weight 62.50 g.

In case of hatchability in this investigation, it was found that overall mean of  $78.95 \pm 4.67$  percent was investigated and percent of average mortality was  $14.50 (\pm 2.96)$ . Duck plague ( $45.50 \pm 5.83\%$ ) and duck cholera ( $22.82 \pm 2.67\%$ ) were prevalent diseases in duck. Alam *et al.* (2014) were in line with this observation. They investigated 83.00 % hatchability, 20.4% mortality in duck and most occurrence of diseases as duck plague, duck cholera.

**Table 3. Production performance of duck reared in backyard system.**

| Variables                    | E Zone<br>(n=153) | W Zone<br>(n=97) | N Zone<br>(n=84) | S Zone<br>(n=82) | Total<br>(n=416) | P value        |        |
|------------------------------|-------------------|------------------|------------------|------------------|------------------|----------------|--------|
|                              | Mean<br>±SD       | Mean<br>±SD      | Mean<br>±SD      | Mean<br>±SD      | Mean<br>±SD      |                |        |
| Amount of feed/bird/day (gm) | 64.83<br>±11.18   | 90.83<br>±15.89  | 76<br>±21.04     | 96.5<br>±19.46   | 82.04<br>±14.36  | *0.0197        |        |
| body wt (kg)                 | 1.114<br>±0.27    | 1.314<br>±0.34   | 1.017<br>±0.25   | 1.438<br>±0.35   | 1.22<br>±0.19    | 0.0726         |        |
| Egg/bird/yr                  | 71.83<br>±20.17   | 92.17<br>±16.85  | 77.83<br>±19.36  | 96.8<br>±18.93   | 84.66<br>±11.76  | 0.1229         |        |
| Egg weight (gm)              | 48<br>±14.63      | 59.14<br>±12.24  | 47.29<br>±7.65   | 56.29<br>±13.97  | 52.68<br>±5.94   | 0.2159         |        |
| Hatchability (%)             | 73.8<br>±18.62    | 82.6<br>±16.79   | 76.2<br>±14.21   | 83.2<br>±12.21   | 78.95<br>±4.67   | 0.729          |        |
| Diseases (%)                 | Duck<br>plague    | 45.8<br>±11.05   | 42<br>±18.69     | 53.6<br>±14.12   | 40.6<br>±12.54   | 45.50<br>±5.83 | 0.5013 |
|                              | Duck<br>cholera   | 24.6<br>±11.1    | 22.5<br>±7.55    | 25<br>±6.35      | 19.17<br>±5.11   | 22.82<br>±2.67 | 0.557  |
|                              | Others            | 15.8<br>±3.34    | 11.6<br>±3.2     | 15.4<br>±4.9     | 12.2<br>±2.8     | 13.75<br>±2.16 | 0.2026 |
| Mortality (%)                | 17.8<br>±4.08     | 11.8<br>±3.34    | 16.2<br>±4.6     | 12.2<br>±4.43    | 14.50<br>±2.96   | 0.0918         |        |

n= Number of duck, \*= Significant (p<0.05)

### 3.4. Performance of productivity of pigeon

The supply of feed to each pigeon per day was  $12.40 \pm 1.24$  g scoring body weight of average  $315.35 \pm 14.21$  g. The average egg production was  $19.90 \pm 0.68$  each year including average weight of  $11.10 \pm 0.70$  g of each egg (Table 4). Kabir (2013b) in accordance with this findings reported that feed intake of each pair of pigeon was 30-40 g per day weighing average 293 g and Kabir (2013a) also investigated that average each egg weight was 11.17 g.

**Table 4. Production performance of pigeon reared in backyard system.**

| Variables                       | E Zone<br>(n=157) | W Zone<br>(n=191) | N Zone<br>(n=47) | S Zone<br>(n=90) | Total<br>(n=485) | P value        |         |
|---------------------------------|-------------------|-------------------|------------------|------------------|------------------|----------------|---------|
|                                 | Mean<br>±SD       | Mean<br>±SD       | Mean<br>±SD      | Mean<br>±SD      | Mean<br>±SD      |                |         |
| Amount of feed/bird/day<br>(gm) | 10.6<br>±2.4      | 13.4<br>±3.05     | 13<br>±4.63      | 12.6<br>±4.33    | 12.40<br>±1.24   | 0.6501         |         |
| body wt (kg)                    | 299.3<br>±56.93   | 330.7<br>±60.83   | 323.2<br>±52.62  | 308.2<br>±82.78  | 315.35<br>±14.21 | 0.8309         |         |
| Egg/bird/yr                     | 19.6<br>±2.6      | 20.8<br>±3.03     | 19.2<br>±3.34    | 20<br>±3.16      | 19.90<br>±0.68   | 0.8595         |         |
| Egg weight (gm)                 | 10.4<br>±1.51     | 11.6<br>±2.07     | 11.8<br>±2.28    | 10.6<br>±1.94    | 11.10<br>±0.70   | 0.6047         |         |
| Hatchability (%)                | 96.8<br>±4.32     | 98.4<br>±1.81     | 96.8<br>±4.65    | 97.8<br>±2.49    | 97.45<br>±0.79   | 0.8603         |         |
| Diseases (%)                    | ND                | 10.6<br>±2.88     | 12.2<br>±3.56    | 9.4<br>±3.64     | 15.2<br>±5.31    | 11.85<br>±2.51 | 0.1521  |
|                                 | Pox               | 19.2<br>±10.43    | 20.6<br>±11.42   | 11<br>±7.17      | 34.2<br>±15.35   | 21.25<br>±9.62 | *0.0417 |
|                                 | Others            | 11.4<br>±4.39     | 12.8<br>±6.18    | 8.6<br>±2.96     | 10.2<br>±4.65    | 10.75<br>±1.78 | 0.5526  |
| Mortality (%)                   | 10.6<br>±2.88     | 11.4<br>±2.88     | 7.2<br>±3.7      | 16.4<br>±6.77    | 11.40<br>±3.80   | *0.0315        |         |

n= Number of pigeon, \*= Significant (p<0.05)

Again,  $97.45 \pm 0.79$  percent average hatchability was observed in this study. The overall mean mortality  $11.40 \pm 3.80$  percent was recorded. Kabir (2013a) observed 98.92% of hatchability in pigeon which supported this result. The overall prevalence of diseases in pigeon was investigated as Newcastle  $11.85 \pm 2.51$  and pox  $21.25 \pm 9.62$  percent. Paul *et al.* (2015) investigated the commonly prevalence pigeon diseases were Newcastle, pigeon pox, salmonellosis etc.

### 3.5. Management practices of backyard poultry

The farmers commonly reared their poultry in semi scavenging system (97.64%) in this study and only a few farmers reared poultry in intensive system (2.36%). The well-developed houses of poultry about 88.82% were made of tin, bamboo wood, concrete, wire etc. and some of farmers did not keep their poultry in well-developed house. They used polythene, sack, ash, sand, straw, papers separately or combined as bedding materials for their poultry and 21.18% of farmers did not use any bedding materials. Few number of farmers cleaned poultry house regularly (26.47%) where as large number of farmers were irregular (73.53%). Farmers supplied rice (84.71%) mostly as feed and commercial feed supplied in a few number of houses (5.88%) as well to their poultry. Farmers fed twice (62.94%) in a day followed by once and thrice. Farmers used feeder and waterer (55.88%) made of soil, plastic and metallic as well but 44.12% farmers did not use feeder and waterer. Only 8.82% farmers performed vaccination for their birds' safety. Farmers collected their poultry from market rather than own or neighbor source. The most current constraints are diseases (54.12%) followed by lack of knowledge and predators for poultry rearing in backyard system (Table 5). This findings were supported by (Alam *et al.*, 2014; Kabir, 2013a; Kabir, 2013b).

**Table 5. Management systems practiced in backyard poultry.**

| Variables             |                   | E Zone     | W Zone     | N Zone     | S Zone     | Total      |
|-----------------------|-------------------|------------|------------|------------|------------|------------|
|                       |                   | n (%)      |
| Households            |                   | 60 (35.29) | 40 (23.52) | 30 (17.65) | 40 (23.52) | 170 (100)  |
| Rearing system        | Semi scavenging   | 59(34.71)  | 39(22.94)  | 30(17.65)  | 38(22.35)  | 166(97.64) |
|                       | Intensive         | 1(0.59)    | 1(0.59)    | -          | 2(1.18)    | 4(2.35)    |
| Housing pattern       | Satisfactory      | 52(30.59)  | 33(19.41)  | 29(17.06)  | 37(21.76)  | 151(88.82) |
|                       | Unsatisfactory    | 8(4.71)    | 7(4.12)    | 1(0.59)    | 3(1.76)    | 19(11.18)  |
| Bedding materials     | Use               | 39(22.94)  | 25(14.71)  | 30(17.65)  | 40(23.52)  | 134(78.82) |
|                       | No use            | 21(12.35)  | 15(8.82)   | -          | -          | 36(21.18)  |
| Cleaning              | Regularly         | 17(10)     | 17(10)     | 7(4.12)    | 4(2.35)    | 45(26.47)  |
|                       | Irregularly       | 43(25.29)  | 23(13.53)  | 23(13.53)  | 36(21.18)  | 125(73.53) |
| Feed type             | Boiled rice       | 33(19.41)  | 16(9.41)   | 16(9.41)   | 21(12.35)  | 86(50.59)  |
|                       | Rice polish       | 12(7.06)   | 12(7.06)   | 10(5.88)   | 11(6.47)   | 45(26.47)  |
|                       | Rice              | 54(31.76)  | 34(20)     | 26(15.29)  | 30(17.65)  | 144(84.71) |
|                       | Paddy             | 32(18.82)  | 16(9.41)   | 13(7.65)   | 15(8.82)   | 76(44.71)  |
|                       | Broken rice       | 2(1.18)    | 4(2.35)    | 2(1.18)    | 4(2.35)    | 12(7.06)   |
|                       | Wheat             | 2(1.18)    | 2(1.18)    | 3(1.76)    | 4(2.35)    | 11(6.47)   |
|                       | Commercial        | 4(2.35)    | 6(3.53)    | -          | -          | 10(5.88)   |
| Feeding frequency/day | Once              | 17(10)     | 17(10)     | 8(4.71)    | 9(5.29)    | 51(30)     |
|                       | Twice             | 40(23.52)  | 18(10.59)  | 21(12.35)  | 28(16.47)  | 107(62.94) |
|                       | Thrice            | 3(1.76)    | 5(2.94)    | 1(0.59)    | 3(1.76)    | 12(7.06)   |
| Feeder and waterer    | Use               | 35(20.59)  | 19(11.18)  | 14(8.24)   | 27(15.88)  | 95(55.88)  |
|                       | No use            | 25(14.71)  | 21(12.35)  | 16(9.41)   | 13(7.65)   | 75(44.12)  |
| Vaccination           | Yes               | 3(1.76)    | 4(2.35)    | 1(0.59)    | 7(4.12)    | 15(8.82)   |
|                       | No                | 57(33.53)  | 36(21.18)  | 29(17.06)  | 33(19.41)  | 155(91.18) |
| Sources of birds      | Own               | 46(27.06)  | 34(20)     | 23(13.53)  | 29(17.06)  | 132(77.65) |
|                       | Market            | 37(21.76)  | 20(11.76)  | 18(10.59)  | 20(11.76)  | 95(55.88)  |
|                       | Neighbor          | -          | -          | -          | 2(1.18)    | 2(1.18)    |
| Constraints           | Lack of knowledge | 14(8.24)   | 9(5.29)    | 16(9.41)   | 24(14.12)  | 63(37.06)  |
|                       | Diseases          | 38(22.35)  | 28(16.47)  | 14(8.24)   | 12(7.06)   | 92(54.12)  |
|                       | Predators         | 8(4.71)    | 3(1.76)    | -          | 4(2.35)    | 15(8.82)   |

n= Number of households

#### 4. Conclusions

Most of the farmers reared their backyard poultry in semi scavenging system in which housing and bedding materials were made of tin and bamboo, and sack respectively. The farmers commonly supplied poor quality feed like rice, boiled rice etc. twice a day. They did not generally use vaccine and bedding (in some cases) for the poultry and cleaned the poultry house monthly rather than daily. Miserable production of egg was investigated but hatchability was in standard mark. The high percentage of mortality and diseases prevalence considerably constrained the rearing of backyard poultry. These findings may assert awareness of the poultry farmers for rearing their birds to get better production.

#### Data availability

All relevant data are within the manuscript.

#### Conflict of interest

None to declare.

#### Authors' contributions

Farzana Fiza Rahima collected data and drafted manuscript. Md. Abdul Jalil contributed in data analysis and editing the manuscript. Md. Reshad Hossain took part in collection of data and manuscript writing. Md. Shaheenur Rahman supervised the work. All authors have read and approved the final manuscript.

#### References

- Alam M, M Ali, N Das and M Rahman, 2014. Present status of rearing backyard poultry in selected areas of Mymensingh district. *Bang. J. Anim. Sci.*, 43:30-37.
- Axe D, 2016. The heart-healthy, disease-preventing health benefits of eggs. <https://draxe.com/health-benefits-of-eggs/>, retrieved on 6 November 2017.
- Azharul I, H Ranvig and M Howlider, 2005. Incubating capacity of broody hens and chick performance in Bangladesh. *Livestock Res. Rural Dev.*, 17:1-10.
- Besbes B, 2009. Genotype evaluation and breeding of poultry for performance under sub-optimal village conditions. *Worlds. Poult. Sci. J.*, 65:260-271.
- Bhuiyan A, 2011. Keynote paper presented at the South Asia Pro Poor Livestock Policy Programme (SAPPLP)-BRAC workshop held at BRAC Centre Inn, Dhaka.
- Bhuiyan A, M Bhuiyan and G Deb, 2005. Indigenous chicken genetic resources in Bangladesh: Current status and future outlook. *Anim. Genet. Resour.*, 36: 73-84.
- Chowdhury S, 2013. Family poultry production in Bangladesh: is it meaningful or an aimless journey? *Worlds. Poult. Sci. J.*, 69: 649-665.
- Das S, S Chowdhury, M Khatun, M Nishibori, N Isobe and Y Yoshimura, 2008. Poultry production profile and expected future projection in Bangladesh. *Worlds. Poult. Sci. J.*, 64: 99-118.
- Dolberg F, 2008. Bangladesh: poultry sector country review. Food and Agriculture Organisation of the United Nations,
- Ershad S, 2005. Performance of hybrid layers and native hens under farmers' management in a selected area of Bangladesh. *Int. J. Poult. Sci.*, 4: 228-232.
- FAO, 2015. Comparative performance of Sonali chickens, commercial broilers, layers and local non-descript (deshi) chickens in selected areas of Bangladesh. *Animal Production and Health Working Paper. No. 14. Rome.*,
- Islam M, I Begum, A Kausar, M Hossain and M Kamruzzaman, 2015. Livelihood improvement of small farmers through family poultry in Bangladesh. *Int. J. Bus. Manag. Soc. Res.*, 1: 61-70.
- Islam M, Q Huque, M Salahuddin and M Sarker, 2003. Proceedings of third international poultry show and seminar, organized by World's Poultry Science Association, Bangladesh branch, Dhaka.
- Islam M, G Seeland, S Bulbul and M Howlider, 2002. Meat yield and cooked meat taste of hybrids from different genetic groups in a hot-humid climate. *Indian J. Anim. Res.*, 36: 35-38.
- Islam S, J Begum, M Hossain and M Khatun, 2017. Marketing of live poultry in northwest of Dhaka city—A value chain analysis. *Am. J. Food. Nutr.*, 5: 28-40.
- Jahan S, M Islam, M Howlider, M Sarder, M Islam and Z Hossain, 2015. Hatchability of Deshi, Fayoumi, RIR and Sonali chickens in forced draft incubator and under broody hens in Bangladesh. *Livest. Res. Rural Dev.*, 27: 15.

- Kabir MA, 2013a. Productivity of crossed indigenous pigeon in semi intensive system. Basic. Res. J. Agric. Sci. Rev, 2: 1-4.
- Kabir MA, 2013b. Productivity, management and marketing of pigeons in pet shop. J. Agric. Econ. Dev., 2: 147-153.
- Khatun R, M Islam, S Faruque, S Azmal and M Uddin, 2005. Study on the productive and reproductive performance of 3 native genotypes of chicken under intensive management. J. Bangladesh Agric. Univ, 3: 99-104.
- Paul T, M Amin, M Alam, M Rahman, Y Sarker and M Rizon, 2015. Occurrence of pigeon diseases at Khulna Sadar, Bangladesh. Bangladesh j. vet. med., 13(2): 21-25.
- Pervin W, S Chowdhury, M Hasnath, M Khan, M Ali and S Raha, 2013. Duck production strategy and profile of duck farmers in the coastal areas of Bangladesh. Livest. Res. Rural Dev., 25: 2013.
- Saha D. 2003. Status of rural poultry production in North 24 Parganas district of West Bengal, IVRI.
- Shanta I, MA Hasnat, N Zeidner, E Gurley, E Azziz-Baumgartner, M Sharker, K Hossain, S Khan, N Haider and A Bhuyan, 2017. Raising backyard poultry in rural Bangladesh: financial and nutritional benefits, but persistent risky practices. Transboundary and emerging diseases, 64:1454-1464.
- Sonaiya E, 2007. Family poultry, food security and the impact of HPAI. Worlds. Poult. Sci. J., 63:132-138.
- Talukdar ML, FT Zuhra, KE Islam and MS Ahmed, 2017. Prevalence of infectious diseases in Sonali chickens at Bogra Sadar Upazila, Bogra, Bangladesh. J. Adv. Vet. Anim. Res., 4:39-44.