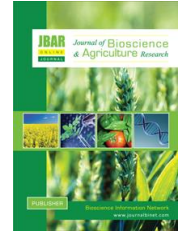


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Broiler production at central and southern region of Bangladesh

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ABSTRACT

Forty one farmers from villages of Mymensingh and Barguna districts in Bangladesh were enumerated to explore knowledge in broiler production. Data were collected on day old chick weight, live broiler weight at market age, feed consumption, mortality rate, farmers' characters and farm management parameters. Few farmers received short training on broiler farming in Barguna (38.10%) and Mymensingh district (15%), most of the farmers did not take training. About 75% farmers in Mymensingh and 33.30% farmers in Barguna district had experiences in broiler farming for 3 years and above. Farm size was smaller in Barguna district than that of Mymensingh district. Most of the broiler farmers were rearing Ross broiler bird in Mymensingh district and Hubbard Classic strain in Barguna district. Most of the farmers had secondary level education. All broiler houses were open sided and about 85% broiler house in Mymensingh district and 85.71% in Barguna district had gable type roof made by corrugated iron sheet (CIS). In Mymensingh district, all farmers were using rice husk as litter materials but most of the farmers (95.20%) of Barguna district were using sawdust for the same purpose. All farmers in Barguna district were using the disposed litter as fertilizer though most of the farmers in Mymensingh district were using the same materials as fish feed. Farmers were using electric brooder and brooding their birds for a period of 7 days while most of the farmers were using hurricane lantern for standby power supply. During loading the day old chicks in the houses most of the farmers used oral saline, vitamin C with water in both districts. Farmers were using Newcastle and Infectious Bursal Disease vaccine for the commercial hybrid broiler birds and 100% farmers were using growth promoter for rapid gain of body weight of broiler birds in study area. Live body weight at marketing age, feed conversion ratio and mortality rate of broiler birds were 1581.58±46.08 gm, 1.84±0.07 and 5.22±0.95%, respectively in Mymensingh district. In Barguna district the same were 1502.38±35.27gm, 1.93±0.04 and 3.51±0.65%, respectively. It might be concluded from the above discussion that a) Broiler farming operation was running by secondary level educated and untrained farmers. b) Farmers were sincere in vaccination of their birds but dishonest to use of growth promoter. They were using corrugated iron sheet made roof in broiler house which could be replaced by suitable locally available materials, like straw, tree leaves etc, to protect birds from heat stress. c) FCR value and mortality rate was high. Quality feed, quality chicks, better management practices could help to increase profitability by reducing FCR value and mortality rate.

Key words: Broiler, broiler farmer character, broiler farm management and growth characteristics

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I. Introduction

Poultry industry is one of the promising sectors of Bangladesh. Poultry industry is supplying quality protein to the people of Bangladesh at the lowest price in the world. During last two decades this sector has grown with an annual rate of 20%. This industry supplying animal protein in terms of meat and egg (Akter and Uddin, 2009) and creating purchasing power and reducing poverty at a large scale. Around 44% of daily human intake of protein comes from livestock products (Islam et al., 2014). One third of the total agricultural contribution (18.60%) in GDP added from poultry industry (Khaled, 2014). Standard annual intake of animal protein per person per year was 43.8 kg according to FAO and WHO but the Breeders Associations of Bangladesh reported per capita availability was only 15.23 Kg here in Bangladesh. The annual consumption of poultry meat is 3.63 Kg at present. The poultry industry is trying to increase this rate to 5 Kg by 2015 and 12 Kg by 2021 (The Dhaka Tribune, 2014). The share of commercial strain of chicken and family poultry was 50:50 in egg production while for meat production it was 60:40 in Bangladesh (Bhuiyan, 2011). Approximately, 50 companies control over 65% of world's poultry production (Mulder, 2013). Probiotics supplementation to broiler diets had positive effects on body weight gain, feed conversion ratio, and mortality rate in broiler chickens (Anjum et al., 2005). This can also benefit the host animal by enhancing the synthesis of certain vitamins, providing digestive enzymes and increasing the production of volatile fatty acids that are finally metabolized in favour of the host (Fritts et al., 2000). Currently, probiotics have been used as a feed supplement in diets of different classes of poultry to enhance productive performance and immune responses (Roy et al., 2015). The onslaught of high temperature brings heat intolerance resulting in high stress, increased vulnerability to diseases, vaccine failures and disease outbreaks, poor FCR, reduction in body weight and even mortality. In addition, birds also start panting to bring down body temperature, which in turn leads to electrolyte imbalance. Consequently, production and performance goes down from the desired levels (Roy et al., 2015). Acidifier litter either with alum or sodium bisulphate improved the desirable traits such as weight gain, feed efficiency and carcass characteristics by improving the microclimatic condition and health status of broiler chicks (Sahoo et al., 2015). FCR of individual group maintained under bio-secured conditions, was tended to be improved compared with the non-bio-secured farm. Growth performances were higher in winter compared to summer. Profitability also was found to be higher in winter compared to summer season. The return was increased with the farm sizes increased (Ali et al., 2015). About 48.1% and 59.6% broiler farmer respondents of Jessore and Bhola district, respectively possessed secondary level of education involved in broiler farming. About 48.08% and 63.46% broiler farmers in Jessore and Bhola district respectively disinfected their farm using lime water. About 40.38% broiler farmers administered vaccine against ranikhet, gumboro, infectious bronchitis diseases and 36.64% administered vaccine against ranikhet and gumboro diseases in Jessore and Bhola district, respectively (Islam et al., 2013). In production management of broiler birds in Bangladesh and around the globe is day by day adopting new knowledge and technologies to increase live body weight for maximize the profit. So, this study was designed and conducted to explore present information about farm size and farmer's characters in broiler farming, to reveal the status of existing management systems of broiler farm and to portrait present status of production performances of commercial broiler at rural village farm.

II. Materials and Methods

The study was conducted to explore the present knowledge about broiler production management in Barguna and Mymensingh district. To pursue the study a pre-prescribed questionnaire was used and 20 broiler farms from Mymensingh district and 21 broiler farms from Barguna district in Bangladesh were enumerated by door to door visit. Farmers

characters such as education level, training and experiences were recorded while farm management parameters like farm size, housing system, commercial hybrid broiler strains, litter materials, drinks during loading day old chicks in house, brooding system, vaccination, growth promoter use were also recorded. Data were collected on day old chick weight, live broiler weight at market age, feed consumption and mortality during June to July 2014. Feed conversion ratio (FCR) and mortality rate up to age of marketing (MTRT) were calculated using following formulae:

$$\text{FCR} = \frac{\text{Total feed (kg) consumed up to the age of marketing}}{\text{Total live weight (kg) of bird at marketing day}} \times 100$$

$$\text{MTRT} = \frac{\text{Total birds dead up to the age of marketing}}{\text{Total day old birds loaded in the house}}$$

The statistical design of the study was unbalanced factorial in nature because the numbers of observations in different traits were unequal. Farm management and production data were analyzed using frequency and descriptive statistics menu under the Statistical Package for the Social Sciences version 14.0 (SPSS, 2005).

III. Results and Discussion

Farmers' characters and farm size

Few farmers received short training on broiler farming in Barguna (38.10%) and Mymensingh district (15%), however most of the farmers did not take training at all (Table 1). The result was contradictory with Sultana et al. (2012) and Rahman et al. (2003), who found 70% farmers, got training on broiler farming. About 75% farmers in Mymensingh and 33.30% farmers in Barguna district had experiences in broiler farming for 3 years and above. Farm size was smaller in Barguna district than that of Mymensingh districts. Most of the enumerated broiler farmers were rearing Ross broiler in Mymensingh district, while in Barguna district majority of the farmers were rearing Hubbard Classic strain. However, most of the farmers had secondary level education in both of the districts.

Broiler farms management

All broiler houses were open sided and about 85% broiler house in Mymensingh district and 85.71% in Barguna district had gable type roof made by corrugated iron sheet (CIS). In Mymensingh district, all farmers were using ricehusk as litter material and most of the farmers (95.20%) of Barguna district were using sawdust as litter materials. All farmers in Barguna were using the disposed litter as fertilizer though most of the farmers in Mymensingh districts were using the same as fish feed. All farmers in both study sites were using electric brooder (Table 2) and brooding their birds for a period of 7 days while most of the farmers were using hurricane lantern for standby power supply. During loading the day old chicks in the houses most of the farmers used oral saline, vitamin C with water. All farmers were using Newcastle and Infectious Bursal Disease vaccine for the commercial hybrid broiler birds and 100% farmers were using growth promoter for rapid gain of body weight of broiler birds in study area. However, Sultana et al. (2012) reported 90% farmers using vaccines while Rahman (2004) found 70% farmers were using vaccines regularly.

Broiler production

Live body weight at marketing age, feed conversion ratio and mortality rate of broiler birds were 1581.58±46.08 gm, 1.84±0.07 and 5.22±0.95 %, respectively in Mymensingh district. In Barguna district the same were 1502.38±35.27 gm, 1.93±0.04 and 3.51±0.65 %, respectively. Similarly, Hauque (2005) found 1.5 kg average market weight per bird but Sultana et al.

(2012) reported live broiler market weight 1.5 to 1.8 kg. However, the feed conversion ratio was similar to Chand et al. (2009), who reported the values 1.93 to 1.94 but Kawsar et al. (2013) reported that training and management intervention could contribute to lower the FCR value (1.49 to 1.53) and higher the productivity in hybrid broiler farming.

Table 1. Farmers characters and farm size

| Parameter | Mymensingh district | | Barguna district | | Overall farmers' characters | |
|--|----------------------------------|--------------|---------------------------------|---------------|-----------------------------|---------------|
| | Level of education | Junior Level | 8 (40%) | Primary Level | 4 (19.00%) | Primary Level |
| Secondary Level | | 10(50%) | Secondary Level | 15(71.40%) | Junior Level | 8(19.51%) |
| | | | | | Secondary Level | 25(60.98%) |
| | Graduate Level | 2(10%) | Graduate Level | 2(9.50%) | Graduate Level | 4(9.76%) |
| Training on broiler rearing | Yes | 3(15%) | Yes | 8(38.10%) | Yes | 11(26.83%) |
| | No | 17(85%) | No | 13(61.90%) | No | 30(73.17%) |
| Experiences | Below 3years | 5(25%) | Below 3years | 14(66.70%) | Below 3years | 19(46.34%) |
| | 3 years and above | 15(75%) | 3 years and above | 7(33.30%) | 3 years and above | 22(53.66%) |
| Farm size | Small farm (500 to 800birds) | 5(25%) | Small farm (200 to 450birds) | 10(47.62%) | Small farm | 15 (36.59%) |
| | Medium farm (1000 to 1600 birds) | 10(50%) | Medium farm (500 to 1000 birds) | 11(52.38%) | Medium farm | 21 (51.21%) |
| | Large farm (2000 to 3000 birds) | 5(25%) | | | Large | 5 (12.19%) |
| Commercial hybrid broiler strains reared | Cobb-500 | 1(5%) | Cobb-500 | 8(38.10%) | Cobb-500 | 9(21.96%) |
| | Ross | 19(95%) | Hubbard Classic | 9(40.90%) | Hubbard Classic | 9(21.96%) |
| | | | Arbor Acres | 2(9.50%) | Arbor Acres | 2(4.88%) |
| | | | Ross | 1(4.10%) | Ross | 20(48.78%) |
| | | | Lohmann | 1(4.10%) | Lohmann | 1(2.44%) |

Table 2. Factors associated with broiler farming

| Parameter | Mymensingh district | | Barguna district | | Overall characters | |
|--------------------------------------|----------------------------|--------------------------|--------------------------|-------------------------|----------------------------------|-------------------------|
| | Roof type of houses | Gable type roof with CIS | 17 (85%) | Shed type roof with CIS | 3(14.29%) | Shed type roof with CIS |
| Shed type roof with CIS | | 1(5%) | Gable type roof with CIS | 18(85.71%) | Gable type roof with CIS | 35(85.37%) |
| Shed type roof with polyethylene | | 1(5%) | | | Shed type roof with polyethylene | 1(2.44%) |
| Other type roof | | 1(5%) | | | Other type roof | 1(2.44%) |
| Type of house | Open house | 20 (100%) | Open house | 21 (100%) | Open house | 41 (100%) |
| Litter materials used | Rice husk | 20(100%) | Rice husk | 1(4.80%) | Rice husk | 21(51.22%) |
| | Other | 0(0%) | Sawdust | 20(95.20%) | Sawdust | 20(48.78%) |
| Uses of disposed litter | Fertilizer | 5(25%) | Fertilizer | 21(100%) | Fertilizer | 26(63.41%) |
| | Fish feeding | 7(35%) | Other | 0(0%) | Fish feeding | 7(17.08%) |
| | Other | 8(40%) | | | Other | 8(19.51%) |
| Brooding system | Electric brooder | 20(100%) | Electric | 21(100%) | Electric | 41(100%) |
| Standby power supply during brooding | Hurricane lantern | 7(35%) | Lantern hurricane | 18(85.70%) | Lantern hurricane | 25(60.96%) |
| | Hazak | 12(60%) | Solar power | 3(14.30%) | Hazak | 12(29.27%) |
| | Generator | 1(5%) | | | Generator | 1(2.44%) |
| | | | | | Solar power | 3(7.31%) |
| Drinks during housing the | Water with oral saline and | 17(85%) | Oral saline mixed water | 5 (23.80%) | Oral saline mixed water | 5(12.19%) |

| | | | | | | |
|----------------------|---|----------|--|-----------|--|------------|
| day old chicks | vitamin C | | Vitamin C mixed water | 4(19.00%) | Vitamin C mixed water | 4(9.76%) |
| | | | Glucose mixed water | 1(4.80%) | Glucose mixed water | 1(2.44%) |
| | Water with oral saline, glucose and vitamin C | 3(15%) | Oral saline and Vitamin C mixed water | 6(28.60%) | Oral saline and Vitamin C mixed water | 23(56.09%) |
| | | | | | Oral saline, vitamin C and lemon juice mixed water | 5(12.19%) |
| | | | Oral saline, vitamin C and lemon juice mixed water | 5(23.80%) | Water with oral saline, glucose and vitamin C | 3(7.31%) |
| Growth promoter used | Yes | 20(100%) | Yes | 21(100%) | Yes | 41(100%) |
| Vaccines used | Newcastle and Infectious Bursal Disease vaccine | 20(100%) | Newcastle and Infectious Bursal Disease vaccine | 21(100%) | Newcastle and Infectious Bursal Disease vaccine | 41(100%) |
| Brooding period | 7 days | 20(100%) | 7days | 21(100%) | 7days | 41(100%) |

Table 3. Production performances of commercial hybrid broiler

| Traits (Mean ± SE) | Mymensingh district | Barguna district | Overall |
|---|--------------------------|------------------|---------------|
| Feed Conversion Ratio (FCR) | 1.84±0.07 (20840) | 1.93±0.04 | 1.89±0.05 |
| Mortality rate in % (MTRT) | 5.22±0.95 (21600) | 3.51±0.65 | 4.37±0.86 |
| Live weight at marketing age in gm (MW) | 1581.58±46.08 (20840) | 1502.38±35.27 | 1541.98±39.60 |
| Marketing age of broiler | 30 to 35 days | 30 to 35 days | 30 to 35 days |
| Day old chick weight range in gm | 40-75 | 20-75 | 20-75 |

IV. Conclusion

Farm size was smaller in Barguna district than that of Mymensingh district. Most of the broiler farmers were rearing Ross broiler in Mymensingh district and Hubbard Classic strain in Barguna district. Most of the farmers had secondary level education. Few farmers received short training on broiler farming in Barguna (38.10%) and Mymensingh district (15%). Most of the farmers did not take training at all in broiler farming. Farmers of Mymensingh (75%) were more experienced than in Barguna (33.30) district. All farmers were rearing broiler birds in open sided house and most of the houses had gable type roof (85% in Mymensingh and 85.71% in Barguna district) made by corrugated iron sheet (CIS). As litter materials, all farmers in Mymensingh district were using rice husk (100%) but for the same purpose most of the farmers in Barguna district were using sawdust (95.20%). Disposed litter materials were using as fish feed in Mymensingh and as fertilizer in Barguna district. All farmers were using electric brooder and brooding their birds for a period of 7 days. Most of the farmers were using hurricane lantern for standby power supply. During loading the day old chicks in the houses most of the farmers used oral saline, vitamin C with water. All farmers were using Newcastle and Infectious Bursal Disease vaccine for the commercial hybrid broiler birds and 100% farmers were using growth promoter for rapid gain of body weight of broiler birds in study area. Live body weight of broiler birds in Mymensingh and Barguna district was 1581.58±46.08 gm and 1502.38±35.27gm, respectively, at the age of 30 days to 35 days. Feed conversion ratio of broiler birds were 1.84±0.07 and 1.93±0.04 in Mymensingh and Barguna district, respectively. However, broiler

bird's mortality rates were $5.22 \pm 0.95\%$ and $3.51 \pm 0.65\%$ in Mymensingh and Barguna districts, respectively. So, it might be concluded from the above discussion that a) Broiler farming operation was running by secondary level educated and untrained farmers, b) Farmers were sincere in vaccination of their birds but dishonest to use of growth promoter; they were using corrugated iron sheet made roof in broiler house which could be replaced by suitable locally available materials, like straw, tree leaves etc. to protect birds from heat stress, and c) FCR value and mortality rate was high. Quality feed, quality chicks, better management practices could help to increase profitability by reducing FCR value and mortality rate.

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