

Performances of commercial hybrid broiler in villages of Bangladesh

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Abstract

A total of 20 broiler farms were enumerated to evaluate the production performance of broiler birds and farm management status at rural villages of Mymensingh Sadar (district headquarters) Upazila under Mymensingh district in Bangladesh. Data were collected on day-old chick weight (DOCW), live broiler weight at market age (MW), feed conversion ratio (FCR), average daily body weight gain (ADG), mortality up to age of marketing (MTRT) during June and July, 2014 using a pre-tested questionnaire by door-to-door visit. Seventeen out of 20 farms had broiler houses with gable type roof of corrugated iron sheet (CIS), all farmers were using rice husk as litter materials and electric brooder for brooding birds for 7 days. To minimize heat stress, 65% farmers used electric fan and drinking water, and to minimize cold stress quantities of litter materials were increased and vitamin C was supplied with lukewarm drinking water. Newcastle Disease (ND) and Infectious Bursal Disease (IBD) vaccines were used by all farmers. Mean ADG, MW, DOCW and MTRT were $45.3 \pm 1.2\text{g/bird}$, $1581.6 \pm 46.1\text{g/bird}$, $54.7 \pm 3.0\text{g/bird}$ and $5.2 \pm 1.0\%$, respectively. Feed from two different companies had no significant effect on FCR and MTRT but feed company affected the ADG significantly. DOCW, farm size and farmer's education did not affect ADG, FCR and MTRT significantly. (*Bangl. vet.* 2014. Vol. 31, No. 2, 84 - 90)

Introduction

In the last two decades the poultry sector in Bangladesh has grown at an annual rate of around 20%. It has improved livelihoods and food, and reduced the dependence on beef and mutton as animal protein sources (Islam *et al.*, 2014). This industry is committed to supplying the nation a cheap source of good quality animal protein (Aker and Uddin, 2009), and reducing poverty (Islam *et al.*, 2014). Investment in the sector stands at about Taka 200 billion (US\$1 = Taka 80). There are over a 100 thousand poultry farms across the country, eight grand-parent (GP) stock farms, 130 parent stock farms and hatcheries, and 50 or 60 poultry feed mills. About five million people are involved, directly and indirectly, with the industry. A large section of marginalized rural people earn their living through this industry. Of the 18.6% of the

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GDP that comes from agriculture, one-third is from the poultry industry (Khaled, 2014). Profitability of broiler production involves planning, demand assessment, integration of activities to bring down the cost of production, foresight into market prices, assessment of cost-benefits and the rate of returns (Sultana *et al.*, 2012). Performance of a broiler farm mainly depends on breed, feed and farm management. Study of performance of rural commercial broilers is scanty. The present study was undertaken to evaluate the performance farm management status of hybrid commercial broiler farming in local villages of Bangladesh.

Materials and Methods

The study investigated broiler production performance and farm management in 20 farms in the villages namely Beltoli, Borobila and Vabkhali of Mymensingh Sadar Upazila during June and July 2014. Data were collected by door to door visit on day-old chick weight (DOCW), live broiler weight at market age (MW), average daily body weight gain (ADG), feed conversion ratio (FCR), and mortality rate up to age of marketing (MTRT) with the help of a pre-tested questionnaire. ADG, FCR and MTRT were calculated using the following formulae:

$$\text{ADG} = \frac{\text{Live weight of bird (g) at marketing day} - \text{day-old weight (g)}}{\text{Age in days of bird at marketing}}$$

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

$$\text{MTRT} = \frac{\text{Total birds dead up to the age of marketing}}{\text{Total day-old birds loaded into the house}} \times 100$$

A total of 21600 Ross hybrid broiler birds from 19 farms out of 20 farms were evaluated but the birds of the rest one farm was not taken in consideration because this farm was rearing hybrid broiler bird other than Ross (in 19 broiler farms there were 21600 Ross and in the other one broiler farm there were 2000 Cobb-500 birds). However, data on education, experience and training of farmers house type, litter material, brooder type and brooding period, feed company, standby power, vaccination, medication, de-worming, heat and cold stress management, drinks and growth promoters were documented from all (20) enumerated farms.

Statistical analyses

Farm management data were analysed using frequency and descriptive statistics menu in SPSS 11.5 software package. The performance means were separated using DMRT, and least square means were calculated using GLM model in SPSS 11.5 software package:

$$Y_{ijk} = \mu + F_i + C_j + e_{ijk}$$

Where, Y_{ijkl} = Dependent variables (ADG, FCR and MTRT)

μ = Overall population mean for any trait

F_i = Effect of i th feed company (where $i = 1$ or 2)

C_j = Effect of j th day old chick's body weight group (where $j = 1, 2$ or 3)

e_{ijk} = Random residual error associated with Y_{ijk} observation.

Results and Discussion

Farm background

About 40% farmers had junior level education, 50% higher secondary level education and 10% were graduates; 15% got training on poultry rearing and 85% had no training on broiler farming (Table 1). However 25% farmers had experience of broiler farming for less than 3 years while 75% had experience for more than 3 years. The results on education level were in line with Sultana *et al.* (2012) and Rahman *et al.* (2002). About 25% were small farms (500 - 800 birds), 50% medium (1000-1600 birds) and the remaining large (2000 - 3000 birds). Similar results were reported by Sultana *et al.* (2012). About 95% farmers reared Ross, while the rest reared Cobb 500 commercial hybrids: this result differed from previous reports (Hauque, 2005; Sharma, 2003; Sultana *et al.*, 2012), where most farmers reared Cobb-500 commercial hybrids. This information indicated that broiler farming at rural level of Bangladesh was dominated by farmers with higher secondary level education or less.

Table 1. Farmers' education and farm size

		Number of farmers	%
Level of education	Junior	8	40
	Secondary	10	50
	Undergraduate	2	10
Training on broiler rearing	Yes	3	15
	No	17	85
Experience	Below 3 years	5	25
	3 years and above	15	75
Farm size	Small (500 - 800 birds)	5	25
	Medium (1000 - 1600 birds)	10	50
	Large (2000 - 3000 birds)	5	25
Commercial hybrid broiler strains reared	Cobb-500	1	5
	Ross	19	95

Farm management

Seventeen broiler houses had gable type roof (Table 2) with corrugated iron sheet (CIS), one had polyethylene, one had roof of CIS and one had other types. All farmers

were using rice husk as litter; 25% of farmers used disposed litter as fertilizer, 35% as fish feed and the rest for other purposes. All farmers were using electric brooders and brooded their birds for 7 days. Only 5% of farmers were using generator as standby power supply for brooding. About 60% farmers were using *hazak* (a traditional lamp locally calls *hazak*, in which lamp, oil burns and high intensity light with heat is being generated) and 35% farmers were using hurricane lanterns as standby power supplier.

Table 2. Factors associated with broiler farming in the villages of Mymensingh Sadar Upazila in Mymensingh district

		Number	%
Roof type of houses	Gable type with CIS	17	85
	Shed type with CIS	1	5
	Shed type with polyethylene	1	5
	Other type	1	5
Litter materials used	Rice husk	20	100
	Other	0	0
Uses of disposed litter	Fertilizer	5	25
	Fish feeding	7	35
	Other	8	40
Brooding system	Electric brooder	20	100
	Other	0	0
Brooding period	7 days	20	100
	More than 7 days	0	0
Standby power supply during brooding	Generator	1	5
	<i>Hazak</i>	12	60
	Hurricane lantern	7	35
Heat stress management	Use electric fan in the house and supply cold water as drink	13	65
	Use electric fan in the house and supply cold water with vitamin C as drink	7	35
Cold stress management	Increased litter materials and used warm drinking water with vitamin C	13	65
	Increased litter materials and used vitamin C in drinking water	3	15
	Increased litter materials and used mild hot drinking water	4	20
Drinks during housing the day-old chicks	Water with oral saline and vitamin C	17	85
	Water with oral saline, glucose and vitamin C	3	15
Steps taken to enhance growth of birds	Yes	20	100
	No	0	0
Vaccines used	ND and IBD	20	100
	Other	0	0
Advice taken from veterinary doctor	Yes	19	95
	No	1	5

To minimize heat stress, 65% of farmers were using electric fans in the house and normal drinking water for birds, while 35% farmers supplied vitamin C with cold drinking water. To minimize cold stress 15% of farmers increased quantities of litter material and supplied vitamin C with drinking water. Similarly, 65% farmers increased litter materials and added vitamin C in lukewarm drinking water, while 20% of farmers increased litter materials and supplied warm water as a drink for the birds.

About 85% of farmers were using oral saline with vitamin C in water during housing the day-old chicks, while 15% of farmers were using oral saline, glucose, and vitamin C in drinking water: interestingly all farmers were using vitamins, amino acids, enzyme, electrolytes, and liver tonic to enhance the growth of broilers. All farmers were using Newcastle Disease (ND) and Infectious Bursal Disease (IBD) vaccines for the commercial hybrid broiler birds and a similar result was reported by Islam *et al.* (2014). However, 95% farmers seek advice from veterinary surgeons for better poultry flock health management.

Broiler production performance

Ross commercial hybrid broiler birds gained a daily average body weight 45.3 ± 1.2 g/bird (Table 3) and attained average live weight at marketing age (30 to 35 days) 1581.6 ± 46.1 g per bird.

Table 3. Performance of Ross commercial hybrid broilers in rural villages

Traits	Mean \pm SE
Average daily body weight gain in g (ADG)	45.3 ± 1.2 (20840)
Feed Conversion Ratio (FCR)	1.8 ± 0.1 (20840)
Mortality rate in % (MTRT)	5.2 ± 1.0 (21600)
Live weight at marketing age in g (MW)	1581.6 ± 46.1 (20840)
Day Old Chick Weight in g (DOCW)	54.7 ± 3.0 (21600)

Average day-old body weight was 54.7 ± 3.0 g/bird, mortality up to the age of marketing was $5.2 \pm 1.0\%$. Feed conversion ratio was 1.8 ± 0.1 , lower than reported by others (Chand *et al.*, 2009; Jaim and Islam, 2008; Kawsar *et al.*, 2013).

Effects of feed and day-old chick's body weight on performance

Average daily body weight gain (ADG) was significantly affected by feed company but FCR and MTRT were not (Table 4). Higher ADG (47.7 ± 2.8 g) and lower MTRT ($3.9 \pm 1.3\%$) were associated with feed from company O and lower FCR (1.8 ± 0.2) were recorded for company N. This might be indicative that feed from company O could help to increase ADG with decreased MTRT but feed from company N could reduce FCR.

Table 4. Effects of feed and day-old chick body weight on performance of Ross commercial hybrid broilers at rural villages

	ADG (g/day/bird)	FCR	MTRT (%)
Feed company N	43.1 ^b ± 2.3	1.8 ± 0.2	9.1 ± 1.1
Feed company O	47.7 ^a ± 2.8	1.8 ± 0.9	3.9 ± 1.3
LS	*	NS	NS
Small size (40-45gm)	45.6 ± 1.7	1.9 ± 0.1	3.9 ± 1.3
Medium size (55-60gm)	45.9 ± 2.3	1.8 ± 0.1	5.1 ± 1.8
Large size (65-75gm)	47.2 ± 2.3	1.8 ± 0.1	8.1 ± 1.8
LS	NS	NS	NS

Note: LS = Level of significance, ^{ab} Means with the different superscripts differed significantly within the column (P<0.05), NS = Not significance and * = Significance at 5% level

Body-weight of day-old chicks (DOCW) did not affect ADG, FCR and MTRT significantly (Table 4).

Effects of farm size

ADG, FCR and MTRT were not affected significantly by farm size (Table 5).

Table 5. Effects of farm size on performance of Ross commercial hybrid broiler at rural villages

Parameters	ADG	FCR	MTRT
Small farm	44.5 ± 2.3	1.9 ± 0.1	7.9 ± 1.8
Medium farm	46.6 ± 1.7	1.8 ± 0.1	4.8 ± 1.3
Large farm	46.0 ± 2.3	1.9 ± 0.1	3.7 ± 1.8
LS	NS	NS	NS

Note: LS = Level of significance and NS = Not significant

Effects of education level of farmers

Education level of farmers did not affect ADG, FCR and MTRT (Table 6).

Table 6. Effects of education on performance of Ross commercial hybrid broiler at rural villages

Level of education of farmers	ADG	FCR	MTRT
Junior	44.3 ± 1.7	1.9 ± 1.1	6.5 ± 1.5
Higher secondary	47.9 ± 1.6	1.76 ± 0.1	4.4 ± 1.4
Graduate	44.8 ± 3.4	2.0 ± 0.2	4.5 ^s ± 3.0
LS	NS	NS	NS

Note: LS = Level of significance and NS = Not significance

Conclusions

Ross commercial hybrid broilers gained daily average body weight $45.3 \pm 1.2\text{g/bird}$ and attained average live weight at marketing age (30 to 35 days) $1581.6 \pm 46.1\text{g/bird}$. Average day-old body weight was $54.7 \pm 3.0\text{g/bird}$, mortality up to the age of marketing was $5.2 \pm 1.0\%$. ADG was significantly affected by feed company. However, DOCW, farm size and farmers education did not affect ADG, FCR and MTRT significantly.

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