Bangladesh Journal of Animal Science
Journal homepage: http://www.banglajol.info/index.php/BJAS

A comparative study on the performances of layer hybrids in some selected areas of Khulna region

SS Islam*, C Paul, BC Sarker

Agrotechnology Discipline, Khulna University, Khulna 9208, Bangladesh

Abstract

A survey was conducted in Batiaghata and Dacope upazilla of Khula district during the period from August to October, 2013 to observe the socioeconomic conditions of poultry farmers, existing feeding and management practices of poultry farms and performances of 5 different layer hybrids. The commercial layer hybrids considered in present study were of 30 layer farmers selected randomly from each Upazilla to collect the information. Data were collected using a pretested questionnaire by direct interview of the farmers. Collected data were analyzed using SPSS. To observe the socioeconomic conditions, the age of selected farmers, their occupation, education level, family size, land size and annual income were considered. Mean age at first lay did not vary significantly among 5 different hybrids. Average mature weights of layer birds varied significantly ($P<0.001$) among 5 hybrids. Average egg production percentage was highest in Hisex White (86.81±1.86) and lowest in Decalb White (59.75±14.81). Average egg weight (g/egg) was highest in ISA Brown (61.65±1.11) and lowest in Decalb White (52.58±4.21). Egg production percentages and egg weights varied significantly among 5 different hybrids. Mortality percentage did not vary significantly but feed consumption per birds per day varied significantly ($P<0.05$) among hybrids. Highest average feed consumption (g/bird/d) was observed in ISA Brown (113.18±1.94) and lowest in Decalb White (95.40±9.09). Correlation coefficient (r) indicates that egg weight increased with the increase of egg production. Among the five different commercial layer hybrids, Hisex White showed the best egg production performance and could be recommended for the farmers of Bangladesh.

Key words: Feeding, Management, Layer performance, Socioeconomic condition

 Bang. J. Anim. Sci. 2013. 42 (2): 114-122

Introduction

Poultry farms in Bangladesh are growing fast in recent years. Due to high population and income growth, urbanization and high income elasticity of demand, the demand for poultry products is expected to increase appreciably in the future. The poultry is particularly important because it is the significant source of protein. Poultry farming is an attractive economic activity as well, especially to women and poor population. It also creates job opportunities and self employment for the growing population of the country. Persons from low income group may also start the business on a small scale. In Bangladesh, commercial poultry production using improved genetics, feeds and management has grown rapidly since the early 1990s in response to increased market demand (Jabbar et al. 2011). The country's poultry population increased from 91 million in 1990 to 140 million in 2006 (Jabbar et al. 2011). At present, there are 10,099 layer farms in Bangladesh of which 2,046 in Khulna Division ranked second among all Divisions (Anonymous, 2010). Major demand of eggs particularly in urban areas is fulfilled by the eggs from hybrids layer poultry. Poultry farmers of the rural areas collect day-old chicks directly from hatcheries or their local agents and thereafter performed brooding and rearing based on the instructions of the chicks suppliers. The day-old chicks are very sensitive. Even the farmers may not provide vaccinations, medications, lighting and other necessary supports in proper way. The poultry farmers also fail to select suitable hybrids to get maximum benefit from farming. Considering the view in mind, the present study was undertaken to study the socioeconomic conditions of poultry farmers, existing feeding and management practices of poultry farms and finally provide a comparative statement of the performances of different layer hybrids.

*Corresponding Author: **sardersislam@yahoo.com**

Materials and Methods

Data were collected from Batiaghta and Dacope Upazilla of Khulna district during the period from August to October, 2013. A total number of 60 layer farmers, 30 from each Upazilla, were selected randomly for data collection.

The questionnaire was prepared keeping in view the objectives of the study. It was designed in a simple manner to get accurate information from the farmers. In order to obtain reliable information door to door survey was performed and data were collected through direct interviewing heads of the farm. Information given by the farmers was recorded and kept for analysis.

Age of the respondents was categorized into 5 groups, i.e. up to 30 years, 31 to 40 years, 41 to 50 years, 51 to 60 years and >60 years. Education levels of the poultry farmers were categorized into 6 groups, Primary, <SSC, SSC, HSC, Bachelor and Masters. Family size of the farmers was categorized into 3, small (4 or below), medium (5 to 6) and large (>6). Respondents were categorized into 5 according to their land size, landless (<0.02 ha), marginal (0.02 to 0.20 ha), small (0.21 to 1.0 ha), medium (1.01 to 3.0 ha) and large (>3.0 ha). On the basis of their annual income farmers were categorized into 3 groups, low income (<1 lac), medium (1 to 3 lac) and high income (>3 lac). Farming experience and training exposure of the poultry farmers were also considered. Some management practices of layer farms like vaccination, debeaking, application of antibiotics, coccidiostat and vitamin mineral premix were observed. Floor systems, disease incidence and feeding practices were also considered. Performances of layer hybrids included age at first lay (week), body weight (g), egg production percentage, egg weight (g), mortality percentage and daily feed intake (g/bird).

Collected data were compiled, coded, tabulated for processing and analysis in accordance with the objectives of the study. To draw a meaningful conclusion, tabular presentation of data was intensively used. The SPSS 11.5 computer programme was used to analyze the data. Descriptive statistics like number, percentage, mean, and standard error were used in describing the selected independent and dependent variables of the study.

Results

Socioeconomic conditions of layer farmers are presented in Table 1. Among the respondents, highest number of farmers (38.2%) was found within the 31 to 40 years age group, followed by 41 to 50 years (32.7%), up to 30 years (16.4%), 51 to 60 years (9.1%) and above 60 years (3.6%). Considering the occupation of the respondents, maximum percentage of respondents had a conjugated occupation of poultry and agriculture (43.3%) followed by exclusive poultry farming (16.7%), poultry and service (15.0%), poultry and business (15.0%), poultry and fish (6.7%) and poultry, agriculture and fish (3.3%). Maximum percentage of farmers belonged to below SSC level of education (30.5%) followed by SSC (28.8%), HSC (20.3%), Masters (10.2%), Bachelor (6.8%) and Primary level of education (3.4%).

Based on the number of family members the poultry farmers were categorized into small (4 or below), medium (5 to 6) and large (>6) family. Most of the farmers had small family (51.7%) followed by medium (36.7%) and large family (11.7%). On the other hand, according to land size poultry farmers were categorized into landless (<0.02 ha), marginal (0.02 to 0.20 ha), small (0.21 to 1.0 ha) and large (>3.0 ha) farmers. In the present study, maximum percentage of poultry farmers belonged to medium land size category (44.4%) followed by small (35.2%), marginal (16.7%) and large (3.7%) categories. According to the family income, farmers were categorized into three groups, low income (<1 lac), medium (1 to 3 lac) and high (>3 lac). Annual income from poultry farm showed that maximum percentage of farmers belonged to medium income group (47.2%), followed by low (39.6%) and high income group (13.2%). Total annual income showed that highest percentage belonged to medium income group (58.5%), followed by high (30.2%) and low income group (11.3%).

Table 1. Socio-economic status of the poultry farmers

Character	Score	Respondents	
		Number	Percentage
Age (years)	Up to 30 yrs	9	16.4
	31 to 40 yrs	21	38.2
	41 to 50 yrs	18	32.7
	51 to 60 yrs	5	9.1
	> 60 yrs	2	3.6
	Total	55	100.0
Occupation	Poultry & Agriculture	26	43.3
	Poultry & Business	9	15.0
	Poultry	10	16.7
	Poultry & Service	9	15.0
	Poultry & Fish	4	6.7
	Poultry, Agriculture & Fish	2	3.3
	Total	60	100.0
Education level	Primary	2	3.4
	<SSC	18	30.5
	SSC	17	28.8
	HSC	12	20.3
	Bachelor	4	6.8
	Masters	6	10.2
	Total	59	100.0
Family size	Small (4 or below)	31	51.7
	Medium (5 to6)	22	36.7
	Large (>6)	7	11.7
	Total	60	100.0
Land size (ha)	Landless (<0.02 ha)	0	00
	Marginal (0.02 to 0.20 ha)	9	16.7
	Small (0.21 to 1.0 ha)	19	35.2
	Medium (1.01 to 3.0 ha)	24	44.4
	Large (>3.0 ha)	2	3.7
	Total	54	100.0
Income from poultry farming (Tk./year)	Low (<1 lac)	21	39.6
	Medium (1 to 3 lac)	25	47.2
	High (>3 lac)	7	13.2
	Total	53	100.0
Total income (Tk./year)	Low (<1 lac)	6	11.3
	Medium (1 to 3 lac)	31	58.5
	High (> 3 lac)	16	30.2
	Total	53	100.0

Based on the farming experience, poultry farmers were categorized into three groups (Table 2), short term (<5years), medium (5 to 10 years) and long term experienced group (>10 years). The study revealed that maximum percentage of farmers had long term experience in poultry farming (48.3%), followed by medium (28.3%) and short term (23.3%). Experience in agricultural farming showed similar trends being highest in long term experienced group (80.9%) followed by medium (12.8%) and small experienced group (6.4%). Majority of the poultry farmers (62.7%) did not participate in any training program and 37.3% farmers had the experience of participating in one or more training for poultry rearing. In present study, farmers in different regions were selected randomly for various hybrid bird's group so that the variations within farmers (because of training, socio-economic status, and the management practices) did not affect the productive performances of the five distinct hybrid groups.

Different management practices of poultry farms are presented in Table 3. Most of the farmers (98.3%) vaccinated poultry birds. On the other hand 95% farmers debeaked poultry. Average 98.3% farmers provided antibiotics to poultry and 96.6% farmers marketed eggs during feeding of antibiotics. To prevent coccidiosis, 82.5% farmers provided coccidiostat regularly. Feeding of vitamin mineral premix was done by 96.7% farmers. Majority of the farmers (85%) reared poultry birds in deep litter system followed by staffed floor (13.3%) and cage (1.7%).

Both readymade and hand mixed feeds were provided to the layer birds. The nutrients content of the hand mixed feed were almost similar to the readymade feed. To minimize the effect of feed quality on the performance of different hybirds, the farmers were selected randomly from two Upazillas. The measured quantity of feeds were divided and supplied in the morning and afternoon equally. Average ingredient composition of the layer rations is presented in Table 4. The major components of layer ration were maize, rice polish, soybean meal, concentrate protein, limestone, layer premix, dicalcium phosphate, common salt and some other additives mentioned in Table 4. Average chemical composition of the feed, both readymade and prepared feeds, used for layer birds is presented in Table 5. The average crude protein content (%) and energy content (ME, Kcal/kg) values were 17.55±0.07 and 2783.33±7.97, respectively.

Table 2. Farming experience and training exposure of the poultry farmers

Character	Score	Respondents	
		Number	Percentage
Experience in poultry farming (years)	Short term experience (<5 yrs)	14	23.3
	Medium experience (5 to 10 yrs)	17	28.3
	Long term experience (>10 yrs)	29	48.3
	Total	60	100.0
Experience in agricultural farming (years)	Short term experience (<5 yrs)	3	6.4
	Medium experience (5 to 10 yrs)	6	12.8
	Long term experience (>10 yrs)	38	80.9
	Total	47	100.0
Training exposure	Trained	22	37.3
	Not trained	37	62.7
	Total	59	100.0

Table 3. Different management practices in poultry farms

Characters	Score	Respondents	
		Number	Percentage
Vaccination	Vaccinated	59	98.3
	Not vaccinated	1	1.7
	Total	60	100.0
Debeaking	Yes	57	95.0
	No	3	5.0
	Total	60	100.0
Application of antibiotics	Yes	58	98.3
	No	1	1.7
	Total	59	100.0
Marketing pattern of eggs during feeding of antibiotics	Yes	57	96.6
	No	2	3.4
	Total	59	100.0
Coccidiostat feeding	Yes	47	82.5
	No	10	17.5
	Total	57	100.0
Vitamin mineral premix feeding	Yes	58	96.7
	No	1	1.7
	Total	59	98.3
Floor system	Deep litter	51	85.0
	Macha	8	13.3
	Cage	1	1.7
	Total	60	100.0

The incidence of diseases in layer farm is presented in Table 6. The study revealed that incidence of more than two diseases was observed in majority of the poultry farms (35.6%) followed by no disease (28.8%), two diseases (22.0%) and one disease (13.6%).

Table 4. Average ingredient composition of the layer ration

Sl. No.	Ingredients	Quantity (kg/100kg)
1	Maize	53.0
2	Rice polish	11.0
3	Soybean meal	20.0
4	Limestone	4.0
5	Concentrate protein	9.0
6	Layer premix	0.30
7	Dicalcium phospahate	1.0
8	Common salt	0.50
9	TGI (Probiotics)	0.07
10	HAL Q (Non antibiotic antimicrobial)	0.10
11	Methionine	0.15
12	Lysine	0.05
13	Maxigrain NSP (Enzyme)	0.04
14	Maxiphos (Phytase)	0.02
15	Bio-Sel-E (Vitamin E & Selenium)	0.04
16	Vitamin C	0.03
17	Zerotox + (Mycotoxins deactivator)	0.30
18	Sal Stop (Salmonella killer)	0.25
19	Allicom (Yeast culture)	0.15
	Total	100.0

Performances of different layer hybrids are presented in Table 7. Average number of layer per farm was 437.25 irrespective of all hybrids where ISA Brown was highest (576.36) and NovoGen White was lowest (357.64). Average age at first lay (weeks) was lowest in Decalb White (18.00±0.52) and highest in Hisex White

(18.79±0.22). Mean differences for age at first lay for among the five hybrids were non significant (p>0.05). Average weight of birds differed significantly (p<0.001) among the different hybrids. Average weight of birds (g/bird) was highest in ISA Brown (1908.82±52.46) followed by NovoGen White (1633.07±56.26), Decalb White (1503.83±113.21), Hy-Line (1469.83± 31.94) and Hisex White (1466.94±36.52). Average egg production (%) was highest in Hisex White (86.81±1.86) followed by NovoGen White (83.16±5.57), Hy-Line (81.70±2.11), ISA Brown (77.71±3.65) and Decalb White (59.75±14.81).

Table 5. Chemical composition of feed used for layer birds

Nutrients	Mean	Std. Error
Crude protein (%)	17.55	0.07
Energy (ME, Kcal/kg)	2783.33	7.97
Calcium (%)	3.41	0.12
Phosphorus (%)	0.39	0.006
Crude fat (%)	4.96	0.04
Crude fibre (%)	4.88	0.130
Lysine (%)	0.86	.02
Methionine (%)	0.42	.003

Table 6. Classification of poultry farms according to disease incidence

Disease incidence	Frequency	Percentage
No disease	17	28.8
One disease	8	13.6
Two diseases	13	22.0
More than two diseases	21	35.6
Total	59	100.0

Average egg production (%) for all hybrids was 80.52±2.28 (Table 7). Mean differences for egg production among different hybrids were significant (p<0.05). Egg weight for five different hybrids differed significantly (p<0.05). Highest egg weight (g) was observed in ISA Brown (61.65±1.11) followed by NovoGen White (59.50±1.72), Hisex White (56.85±1.30), Hy-Line (55.46±1.34) and Decalb White (52.58± 4.21). Average egg weight for all hybrids was 57.64±0.81. Average mortality percentage of five different hybrids did not vary significantly (p>0.05). However, numerically highest mortality percentage observed in Decalb White (22.21±9.98) followed by Hy-Line (14.31±4.24), Hisex White (13.25±3.21), NovoGen (8.45± 2.24) and ISA Brown (6.60±1.91). Average mortality of all hybrids was 12.55±1.87. Highest feed consumption per bird (g/day) was observed in ISA Brown (113.18±1.94) followed by Hisex White (106.63±1.93), Hy-Line (101.58±2.62), NovoGen White (100.12±4.28) and Decalb White (95.40±9.09). Average feed consumption per bird (g/day) was 104.36±1.62. Mean feed consumptions (g/bird/d) among different hybrids were varied significantly (p<0.05).

The result revealed that with the increase of age, body weight of birds increased progressively and significantly (P<0.001) except 51 to 60 weeks age group (Table 8). Highest weight of birds (g/bird) was observed in >60 weeks age group (1825.17±102.18) and lowest in up to 30 weeks age group (1431.31±55.31). Highest egg production percentage was observed in 31 to 40 weeks (86.07±1.74) and lowest in up to 30 weeks age group (67.11±9.28). Egg production percentage was varied significantly (p<0.05) according to age of birds. Egg weight (g) was increased progressively and significantly (p<0.001) with increasing age of birds except 51 to 60 weeks age group.

Highest egg weight (g) was observed in >60 weeks age group (63.65±1.71) and lowest in up to 30 weeks age group (51.11±1.96). Mortality percentage of birds did not vary significantly according to age. On the other hand, feed consumption per bird (g/day) increased progressively and significantly (p<0.001) with increasing age of birds except 51 to 60 weeks age group. Highest feed consumption (g/bird/ day) was observed in >60 weeks age group (113.17±1.64) and lowest in up to 30 weeks age group (93.46±5.05).

Table 7. Performances (mean±SE) of different layer hybrids

Hybrid	No.	Birds/farm	Age at first lay (wk)	Weight of birds (g/bird)	Egg production (%)	Egg weight (g/egg)	Feed intake (g/bird/d)	Mortality (%)
Hisex White	17	400.35±80.47	18.79±0.22	1466.94±36.52	86.81±1.86	56.85±1.30	106.63±1.93	13.25±3.21
Hy-Line	12	454.58±48.97	18.67±0.28	1469.83±31.94	81.70±2.11	55.46±1.34	101.58±2.62	14.31±4.24
ISA Brown	11	576.36±136.02	18.09±0.37	1908.82±52.46	77.71±3.65	61.65±1.11	113.18±1.94	6.60±1.91
Decalb	6	444.67±87.30	18.00±0.52	1503.83±113.21	59.75±14.81	52.58±4.21	95.40±9.09	22.21±9.98
NovoGen White	14	357.64±81.03	18.43±0.25	1633.07±56.26	83.16±5.57	59.50±1.72	100.12±4.28	8.45±2.24
Total	60	437.93±40.70	18.48±0.13	1590.98±30.90	80.52±2.28	57.64±0.81	104.36±1.62	12.55±1.87
Sig. level		NS	NS	***	*	*	*	NS

*NS, non significant (p>0.05); *, P<0.05; ***, P<0.001*

Table 8. Performance of layer hybrids according to their age

Age of bird (weeks)	No. case	Weight of birds (g/bird)	Egg production (%)	Weight of eggs (g/egg)	Mortality (%)	Feed intake (g/bird/d)
Up to 30 weeks	13	1431.31±55.31	67.11±9.28	51.11±1.96	13.45±5.27	93.46±5.05
31 to 40 weeks	19	1548.68±51.84	86.07±1.74	57.73±1.21	9.66±2.40	106.26±1.82
41 to 50 weeks	14	1730.29±58.86	85.62±2.62	60.80±1.11	15.61±4.25	109.15±2.19
51-60 weeks	8	1531.50±28.44	84.88±1.64	58.03±0.68	11.92±4.77	103.63±2.32
> 60 weeks	6	1825.17±102.18	71.20±3.48	63.65±1.71	14.05±3.99	113.17±1.64
Total	60	1590.98±30.90	80.52±2.28	57.64±0.81	12.55±1.87	104.36±1.62
Sig. level		***	*	***	NS	***

*NS, non significant (p>0.05); *, P<0.05; ***, P<0.001*

Table 9. Performance of layer hybrids according to their live weight

Weight of birds (g)	No.	Egg production (%)	Egg weight (g/egg)	Mortality (%)	Feed intake (g/bird/d)
Low wt. (1200 to 1400g)	13	71.38±8.13	49.98±1.79	9.80±3.31	93.00±5.42
Medium wt. (1401 to 1600 g)	23	83.76±3.15	57.83±0.75	11.36±2.60	105.41±1.42
High wt. (1601to 1800 g)	12	84.63±3.26	60.81±1.37	17.67±3.93	105.05±2.09
Heavy wt. (>1800g)	12	79.31±3.10	62.42±1.06	14.08±7.43	113.17±2.10
Total	60	80.52±2.28	57.64±0.81	12.56±1.87	104.36±1.62
Sig. level		NS	***	NS	***

*NS, non significant (p>0.05); *, P<0.05; ***P<0.001*

Egg production percentage, egg weight, mortality percentage and average feed consumption per bird per day were also expressed according to the body weight of birds (Table 9). The study revealed that the egg production percentage did not vary significantly (p>0.05) according to the weight of birds. However, the egg weight (g/egg) was increased significantly (p<0.001) and progressively with increasing weight of birds being highest in heavy weight group (62.42±1.06) and lowest in low weight group (49.98±1.79). Mortality percentage was not varied significantly (P>0.05) among different weight groups of birds. Average feed consumption (g/bird/d) was increased progressively and significantly (P<0.001) with increasing weight of birds being highest in heavy weight group (113.17±2.10) and lowest in low weight group (93.00±5.42).

The values of correlation coefficient (r) revealed that weight of birds (r=0.32*) and egg weight (r=0.17) were positively correlated with hybrids but egg production percentage (r=-0.21) and feed consumption (r=-0.21) were negatively correlated with hybrids types (Table 10). Age of bird was positively and significantly correlated with weight of birds (r=0.41**), weight of eggs (r=0.52**) and daily feed consumption

(r=0.40**). Weight of bird was also positively and significantly correlated with weight of eggs (r=0.67**) and daily feed consumption (r=0.51**). On the other hand, egg production and egg weight are positively and significantly correlated (r=0.42**). It indicates that egg weight increased with increasing egg production percentage. Egg production and feed consumption are also positively and significantly correlated (r=0.55**). Weight of eggs and feed consumption are positively and significantly correlated (r=0.58**) which indicates that feed consumption increased with the increase of egg weight.

Table 10. Correlation co-efficient (r) between different traits

	Hybrids	Bird age	Bird wt.	Egg production	Egg wt.	Feed intake
Hybrids	1	NS	*	NS	NS	NS
Age of bird	-0.10	1	**	NS	**	**
Wt. of Birds	0.32	0.41	1	NS	**	**
Egg production	-0.21	0.12	0.12	1	**	**
Eggs wt.	0.17	0.52	0.67	0.42	1	**
Feed intake	-0.21	0.40	0.51	0.55	0.58	1

**, p<0.05; **, p<0.01; NS, non-significant*

Discussion

In a study, Eva (2013) reported that the majority of the farmers (43.3%) belonged to 41 to 50 years age group which is inconsistent with the present study. In the present study, majority of farmers belonged to 31 to 40 years age group. Majority of the poultry farmers (30.5%) in the present study had <SSC level of education. However, Eva (2013) observed that majority of the poultry farmers educated in HSC level. Majority of the farmers belonged to small sized family (up to 4) which is in agreement with the findings of Eva (2013). In the present study, majority of the respondents had medium level of annual income from poultry farming (1 to 3 lac) which is consistent with the findings of Eva (2013).

Majority of the farmers (48.3%) had long term (>10 years) experience in poultry farming which is similar to the findings of Eva (2013). In the present study, 37.3% layer farmers were found trained which is below than the national average. Anonymous (2010) reported that 57.27% layer farmers were trained in Bangladesh and 60.87% in Khulna Division.

Maximum farmers (98.3%) practiced vaccination program in the layer farms which is similar to the findings to Eva (2013) as 96.7%. Maximum farmers (96.6%) marketed eggs during application of antibiotics which is inconsistent with the findings of Eva (2013). She reported that 60.0% farmers marketed egg during antibiotics feeding. Most of the farmers fed coccidiostat and vitamin mineral premix to the birds which are in agreement with the findings of Eva (2013).

Khan *et al*. (2008) reported that both readymade and self prepared feed were supplied to layer birds which is consistent to the present results. They observed that the crude protein contents of layer rations of different farms ranged from 17.91 to 18.44% which is higher than that of present result (17.55%). Metabolizable energy contents (Kcal/kg) of layer feeds studied by Khan *et al*. (2008) ranged from 2706 to 2896 which is close to the findings of present study (2783.33).

Average egg production percentage of all layer hybrids was 80.52±2.28 which is similar to the national average of 80.0% (Anonymous, 2010). Egg production percentage of Hisex White was highest compared to other hybrids under study. Similarly Ershad (2005) observed higher egg production in white shelled layers compare to brown shelled layers. Egg production percentage decreased gradually after first year of age. The probable explanation for more egg production in first production cycle may be the ability of birds to utilize their feed more efficiently than those of second production cycle. The egg weight (g) of ISA Brown (61.65±1.11) was highest in the present study. Ershad (2005) also observed higher egg weight in brown shelled layers (57.32±0.85). Weight of eggs increased significantly with the increase of age of layer hybrids which is similar to the finding of Yasmeen

et al. (2008). Peebles *et al.* (2000) also found that egg weight of layers increased with the increase in age of birds. Similar results have been reported by Suk and Park (2001) in two commercial egg type strains of chicken where egg weight increased with increase in age.

Feed consumption (g/bird/d) was affected by hybrids ($p<0.05$) which is in agreement with the findings of Petek (1999). North (1984) reported higher feed consumption for large-sized chicken than smaller which is also consistent to the present findings. Mean feed consumption of different hybrids increased significantly ($P< 0.001$) is in agreement with the findings of Mehta et al. (1886). However, Schafer et al. (2005) and Yasmeen et al. (2008) reported non-significant variation in feed intake between pullet and spent layers. The reason for the contrary findings might be difference in the hybrids of layer used for these studies. Pearson correlation analysis revealed a positive relationship between age and body weight of birds (Agaviezor et al. 2011) which is consistent with the present findings. A positive and significant correlation between body weight and egg weight was observed by Haq et al. (2011) which is in agreement with the present study. Egg weight and feed consumption was positively and significantly correlated in the present study is supported by Santos et al. (2000). Lower egg weight in the early laying stage is due to fact that some portion of nutrient is utilized to support the body weight gain of pullets. On the other hand increased daily feed consumption with the increase of body weight in the present study is related to the higher maintenance requirements of heavy hens than light hens.

Conclusion

Results of present study revealed that the performance of 5 different hybrids in terms of hen-day egg production, average egg weight and daily feed consumptions were variables, and the egg production performance of Hisex White was better than other four types. However, further studies are necessary including more farms and number of hybrids to recommend a single hybrid as best performer to be considered for the farmers of Bangladesh.

Acknowledgement

The authors are grateful to the Ministry of Education, People's Republic of Bangladesh for financial support under the "Grants for Advanced Research in Science".

References

Agaviezor BO, Ajayi FO, Adebambo OA, Gunn, HH (2011). Nigerian indigenous vs exotic hens: the correlation factor in body weight and laying performance. African Research Review, 5: 405-413.

Anonymous (2010). Farm Poultry and Livestock Survey 2007-08, Bangladesh Bureau of Statistics.

Ershad SME (2005). Performance of hybrid layers and native hens under farmers' management in a selected area of Bangladesh. International Journal of Poultry Science, 4: 228-232.

Eva F (2013). Use pattern of antibiotics in poultry rations of some selected farms of Khulna region. Undergraduate thesis, Agro-technology Discipline, Khulna University, Khulna.

Haq R, Haq E, Khan MF (2011). Correlation between body weight and egg weight of Dokki and Fayoumi hen in Pakistan. Journal of Basic Applied Sciences, 7: 165-168.

Jabbar MA, Rahman MH, Talukder RK, Raha SK (2011). Exit from Bangladesh's poultry industry: causes and solutions. ILRI Policy Brief, December.

Khan MMH, Chowdhury B, Bhuiyan MRH, Uddin MJ, Dawlatana M, Rahim M (2008). Nutrient content of poultry feed used in different poultry farms of Bangladesh. Bangladesh Journal of Scientific and Industrial Research, 43: 1-12.

Mehta VS, Lakhotia RL, Singh B (1986). A study on forced resting and recycling of white layers. Indian Journal of Animal Production and Management, 2: 138-140.

North MO (1984). Breeder Management. In Commercial Chicken Production Manual. The Avi. Publishing Company. Inc. Westport, Connecticut. P. 298-321.

Peebles ED, Zumwalt CD, Doyle SM, Gerard PD, Latour M, Boyle CR, Smith TW (2000). Effects of breeder age and dietary fat

source and level on broiler hatching egg characteristics. Poultry Science, 79: 698-704.

Petek M (1999). Production traits and economic efficiencies of different genotypes of layers reared by enterprises in Bursa province and it's near vicinity. Veteriner Fakultesi Dergisi Uludag Universitesi, 18: 65-77.

Santos TT, Dos A, Corzo, Kidd MT, McDaniel CD, Torres Filho RA, Araújo LF (2000). Influence of in ovo inoculation with various nutrients and egg size on broiler performance. Journal of Applied Poultry Research, 19: 1-12.

Schafer CM, Corsiglia CM, Mireles AJr, Koutsos EA (2005). Turkey breeder hen age affects growth and systemic and intestinal inflammatory responses in female poults examined at different ages post-hatch. Journal of Applied Poultry Research, 14: 258-264.

Suk Y, Park C (2001). Effects of broiler breeder age and length of egg storage on albumen characteristics and hatchability. Poultry Science, 80: 855-858.

Yasmeen F, Mahmood S, Hassan M, Akhtar N, Yaseen M (2008). Comparative productive performance and egg characteristics of pullets and spent layers. Pakistan Veterinary Journal, 28: 5-8.