



Performance of hilly and naked neck hilly chicken at Naikhongchari of Bangladesh

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ABSTRACT

A study was conducted to evaluate the production and hatching performances of hilly chickens and naked neck (NN) hilly chickens at the hilly areas of Naikhongchari regional station research farm of Bangladesh Livestock Research Institute (BLRI). The experimental chickens were reared in an open-sided poultry house under an intensive management system for a period of 18 month. The birds were allowed to take feed and clean drinking water *ad libitum*. Data on productive and reproductive performances of hilly and NN hilly chickens were recorded regularly. Result revealed that no significant ($P>0.05$) difference on body weight of day old, 2nd weeks and 4th weeks of age but significantly ($P<0.05$) differ on 6th to 12th weeks of age on hilly and NN hilly chicken. Result also showed that average feed intake and mortality percentage at day old to 12th weeks of age were significantly ($P<0.05$) differ among hilly and NN hilly chicken. It was found that no significant ($P>0.05$) difference of egg weight and chick weight between hilly and NN hilly chicken but significantly ($P<0.05$) differed in hatchability percentage. On the other hand, result exhibited that average body weight (ABW) of cock and hen, feed intake and mortality were significantly ($P<0.05$) differed among hilly and NN hilly chicken. Hen days egg production was significantly ($P<0.05$) differed between hilly and NN hilly chicken but no significant ($P>0.05$) difference of average total egg weight and age at first egg. These findings imply that Hilly chicken performance was better than NN hilly chicken in terms of body weight (BW), age at first egg (AFE) and egg production. Both hilly (feathered) and NN hilly chickens need to be conserved and improved further through selective breeding and a better management system.

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Introduction

The majorities of the tribal people live in the hilly areas with primitive ways of life. These regions possess a slightly different type of genetic resources of livestock and poultry rather than the common indigenous stock. In Bangladesh, different types of native chicken are found such as hilly, NN, Native dwarf, Aseel, Yeasine, Frizzled plumage and common native of non-descriptive deshi (Das et al. 2008). Bhuiyan et al. (2013) reported in Bangladesh approximately 135 million chickens are scattered throughout the

country which are mostly indigenous, non-descript types. Courtyard smallholder native chickens is produced in scavenging system in natural environment with each family keeping on an average of 6–7 chickens to meet household demand, and also earnings cash when it is necessary.

Nevertheless, local non-descriptive colored chicken is a key resource of tasty meat and eggs for the rural people (Barua, 1990). The hilly and NN hilly chicken are generally found in the Hill Tract regions of the Chattogram district. Rural people always try to search the native (desi)

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cockerel for its tenderness and special taste (Ahmed and Ali, 2007). Native chicken is always thought to be superior in terms of carcass composition than commercial broilers due to its low-fat content (Ganabadi et al. 2009). Faruque et al. (2013) found that hilly chicken was better than non-descriptive deshi and naked neck in terms of weight gain. The heavier size of both hilly and NN hilly chickens compared to other native birds indicates that they can be used as meat-type native chickens in Bangladesh. Rahman et al. (2013) found that at the age 8 weeks hilly chick's body weight was 503g with a feed conversion rate of 2.8. Moreover, Chowdhury et al. (2006) reported that productivity of indigenous chicken breeds may be doubled with quality diet and management conditions. Rahman et al. (2013) also found that Native hilly chicken utilized a higher protein-energy diet more efficiently and found body weights of 699g and 937 g at the age of eight and ten weeks, respectively with corresponding feed conversion rates (FCR) of 2.69 and 2.89. Deshi hens egg production could be increased up to 135 eggs per year by following a proper selection programme (Khan, 1983). Faruque et al. (2013) observed increased egg production and body weight and reduced sexual maturity age in the 2nd generation of the selection process compare to foundation stock of hilly chicken. However, systematic information according to genetic and phenotypic parameter of both hilly and NN hilly chickens is very limited. These hilly and NN hilly chickens are no doubt a promising figure/asset of Bangladesh but are going to be extinct. Thus, their conservation and improvement of genetic resources as insurance against future needs has become an issue of growing concern (Crowford, 1984). Therefore, the main objective of the research work is to evaluate the productive and reproductive performance of both hilly and NN hilly chicken and their improvement at Naikhongchari hilly region.

Materials and Methods

The study was conducted at BLRI Research farm of Naikhongchari (21.4272° N, 92.1786° E) regional station under Bandarban district. The experimental 121 adult hilly and 21 NN hilly chickens were reared in an open-sided poultry house under an intensive management system for a period of 18 month. Both broody hen and incubator were used for hatching chicks. Both hilly and NN hilly chicks were reared on the floor

containing rice husk as litter materials. Ready feed of standard starter, grower and layer were fed during the experimental period of 18 months. The birds were allowed to take feed and clean drinking water *ad libitum*. Vaccination was done as a preventive measures only for Ranikhet and Fowl Pox diseases. Birds were de-wormed on a regular interval. Necessary hygienic and biosecurity measure was taken. Natural hatching was done by hen using conventional bamboo basket nest. Data on body weight (g), feed intake (g), age of first egg (days), egg production (no.), egg weight (g), Hatchability and mortality percentage were recorded regularly.

Statistical Analysis

Statistical analysis was done using the SPSS 20.0 statistical program of collected data. Duncan's Multiple Range Test (DMRT) were also done to compare the treatment means for different parameters.

Results and Discussion

Performance up to 12 weeks of age

Body weight at different ages, feed intake and mortality percentage of hilly and NN hilly chicken were presented in Table 1. Result exhibited that no significant ($P>0.05$) difference on body weight of day old, 2nd weeks and 4th weeks of age but significantly ($P<0.05$) differ on 6th to 12th weeks of age on hilly and NN hilly chicken. Result also showed that average feed intake and mortality percentage at day old to 12th weeks of age were significantly ($P<0.05$) differ among hilly and NN hilly chicken. Faruque et al. (2007) found the body weight at day old and at 8th weeks of age for ND, H and NN genotypes were 31.2, 30.5, 31.7 g and 481.9, 449.0 and 476.0 g, respectively. These findings are similar in day old body weight but 8th weeks body was slightly higher of the present study. The present finding also agreed with Faruque et al. (2013) who found that hilly chicken was better than non-descriptive indigenous and NN chicken in terms of body weight gain.

Hatching performance

Egg weight, chick weight and hatchability percentage of hilly and NN hilly chicken were presented in Table 2. Result showed that no significant ($P>0.05$) were found of egg weight and chick weight between hilly and NN hilly chicken but significantly ($P<0.05$) differed in

hatchability percentage. Azharul et al. (2005) reported hatchability percentage by indigenous broody hens was 87.2% which was higher than

the present findings with mean egg weight of 41g which was similar to present findings for hilly chicken eggs but lower for NN hilly chicken eggs.

Table 1. Performance of growing hilly and naked neck (NN) hilly chicken reared up to 12 weeks (mean±SD)

Parameter	Hilly chicken (n=213)	NN hilly chicken (n=25)	P-value
Body weight			
DOC	30.29 ± 2.83	30.79 ± 3.23	0.141
2 Weeks	94.55 ± 16.74	93.33 ± 13.8	0.493
4 Weeks	197.89 ± 23.54	196.19 ± 30.58	0.564
6 Weeks	344.72 ± 32.96	377.21 ± 36.33	<0.001
8 Weeks	531.49 ± 30.62	514.17 ± 51.23	<0.001
10 Weeks	736.87 ± 43.49	694.63 ± 50.22	<0.001
12 Weeks	915.29 ± 45.89	940.47 ± 81.73	0.002
Feed Intake (g/bird/d)	29.25 ± 18.41	34.59 ± 17.64	0.007
Mortality (%)	7.53 ± 2.86	12.00 ± 4	<0.001

Mean in the same row with differ significantly ($P < 0.05$); SD, Standard Deviation; DOC, Day old chick

Table 2. Hatching performance of chicken as hatched by broody hens and incubator (mean±SD)

Parameter	Hilly chicken	NN hilly chicken	P-value
Egg weight (g)	42.91 ± 3.84	44.12 ± 2.8	0.162
Chick weight (g)	30.29 ± 2.83	30.79 ± 3.23	0.141
*Hatchability (%)	68.28 ± 12.97	60.94 ± 2.88	0.040

Mean in the same row with differ significantly ($P < 0.05$); SD, Standard Deviation; NN, naked neck; *Hatchability percentage calculated about 350 no of hilly chicken and 41 no of NN hilly chicken egg set

Another findings of Khatun et al. (2005) showed that the hatchability on fertile eggs ranged from 78.33 to 90.79% in different genotypes with the overall percentage of 85.99, which was higher than the present findings. Hatchability of fertile eggs is influenced by genetic environmental factors like storage temperature and humidity, care of egg, quality of eggs, age and nutrition of layers and season etc. (Olsen and Hyne, 1984).

Performance adult chicken

Adult body weight, total egg production, egg weight, age at first egg, feed intake and mortality percentage of hilly and NN hilly chicken were shown in Table 3. Result showed that mean body weight of cock and hen, feed intake and mortality were significantly ($P < 0.05$) different among hilly

and NN hilly chicken. Hen days egg production was significantly ($P < 0.05$) higher in hilly chicken than NN hilly chicken but no significant ($P > 0.05$) different of average total egg weight and age at first egg. Talukder et al. (2016) found that body weight of adult hilly and NN hilly cock and hen were 2664±68, 2244±134 and 2576±68, 2005±79g, respectively, which was more or less similar to present findings.

Talukder et al. (2016) also reported that feed intake of hilly and NN hilly chicken were 97.61±11 102±22g/ bird/day, respectively, which was higher than the present findings. However, the mortality of NN hilly chicken was higher than Hilly chicken. This may be a smaller number of populations of NN hilly chicken than hilly chicken.

Table 3. Performance (mean±SD) of adult hilly and naked neck (NN) hilly chicken at Naikhongchari hilly areas

Parameter	Hilly chicken (n=121)	NN hilly chicken (n=21)	P-value
Body weight of adult cock age at 30 weeks (g)	2869.20 ± 153.8	2531.20 ± 120.97	<0.001
Body weight of adult hen age at 30 weeks (g)	2111.32 ± 158.84	1990.94 ± 215.32	0.013
Hen days egg production (%)	34.30 ± 3.22	28.30 ± 2.1	<0.001
Egg weight (g)	41.99 ± 4.93	40.17 ± 2.75	0.172
Age at 1 st egg (days)	152.0 ± 3.44	159.0 ± 3.01	0.142
Average feed intake (g/bird/d)	89.68 ± 6.76	95.2 ± 6.91	<0.001
Mortality (%)	12.94 ± 3.78	18.39 ± 4.09	<0.001

Mean in the same row with differ significantly ($P < 0.05$); SD- Standard Deviation

Conclusions

From the above findings imply that hilly chicken performance was better than naked neck hilly chicken in terms of body weight, age at first egg and egg production. Both hilly (feathered) and naked neck hilly chickens need to be conserved and improved further through selective breeding and a better management system. Further, study of conservation and improvement of native chickens should be continued because its population has been undergoing genetic erosion day by day through developed countries improved stock introduced.

Conflict of interest

None to declare.

Authors Contributions

MAA and RK designed and conceived the study. MAA, MTH and MAH performed the experiments. MAA analysed the data and wrote the article. MRHR and MTH critically reviewed and revised the manuscript. All authors read and approved the final version.

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Performance of hilly and naked neck hilly chicken

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