

Phenotypic Characteristics and Weight-gain Up to Sexual Maturity of Aseel and F₁ of Hilly (Red Jungle X Hilly) Chicken

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Abstract: A study was carried out from June 2008 to May 2009 on Aseel and F₁ of Hilly chicken under intensive rearing system at Chattogram District of Bangladesh. The aim of the study was to estimate phenotypic characteristics and weight-gain up to sexual maturity of Aseel and F₁ of Hilly chicken. The Aseel and F₁ of Hilly chickens were collected from the Sarail Upazila of Brahmanbaria District and hill tract regions of Bangladesh. After collection the chickens their morphological characteristics and the measurements of different body parts were recorded. The average mature weight of Aseel male and female were 4000±94.99 gm and 2200±67.82 gm. Their earlobe is red and they possess single comb in case of male and strawberry type comb in case of female and their shank color is yellowish white in male and yellow in female. The shank length, the total body length and ground to head height was recorded in male and female 15.24±.22cm and 10.79±.10cm, 73.66±.76cm and 56.52±.53cm, 60.96±.43cm and 48.26±.42cm respectively. The length of sickle feather was found 26.67±.77cm in cock. Adult live weight of F₁ of Hilly males and females were 900 ±28.67gm and 850±24.04gm respectively. Their earlobe is red and they possess single comb and their shank color is blackish yellow. Length, color of wattle rudimentary, red and the color of eye and eye ring was found black and red in both male and female F₁ of Hilly. The shank length, beak to tail length and ground to head height was found in case of F₁ of Hilly male and female 8.89±.31cm and 7.62±.35cm, 54.46±.55cm and 38.98±.53cm, 31.75±.62cm and 25.4±.58cm respectively. But the length of sickle feather of cock was found 33.02±.46 cm. The average weight-gain of Aseel chicks after first laying age was (1995 gm) which was higher than that of F₁ of Hilly (850 gm). The first laying age of both Aseel and F₁ of Hilly were 210 and 180 days respectively. Weight-gain and environmental adaptation of Aseel chicks were better than F₁ of Hilly. So, the former breed is better for conservation issue than the later in the ex-situ conservation system.

Keywords: Aseel, F₁ of Hilly, Phenotypic Characteristics, Weight-gain

1. Introduction

Approximately 140 million chickens are scattered throughout 68,000 villages in Bangladesh which mostly of indigenous non-descript type [1]. Native chickens constitute a special genetic niche evolved by natural selection which is crucial to the continued animal production in the country [3]. The indigenous chickens have undergone unknown periods of natural selection and are a reservoir of excellent genetic diversity. They show

high level of morphological and phenotypic variability and increased fitness under natural settings [10]. Indigenous chicken population is composed of a number of breeds/types such as non-descript Deshi, Aseel, Naked Neck and Hilly [2]. No attempts have been made to improve and conserve these genetic resources and they are going to be extinct. Aseel is well known for its pugnacity, high stamina, majestic gait and dogged fighting qualities. The Aseel is, therefore, known to every game lover all over the world for these specific characteristics. These

birds are also known for its plentiful delicious and flavored meat [13]. The Aseel indigenous game birds are found in Sarail Upazila in the Brahmanbaria district and in the Chattogram region. The genetic distances among indigenous Deshi populations were very small but the distance between the Deshi and Aseel was relatively large which almost corresponded to the differences between the breeds. In Chittagong hill tract and adjacent Myanmar area one type of bird namely- Hilly chicken are found which is well adapted in local environment, relatively more disease resistance and have broodiness [8]. One of the native types F_1 of Hilly (Red Jungle X Hilly) Chicken is reared in hill tract region of Bangladesh. This type chicken was mainly produced where the Red Jungle fowl and Hilly chicken share the same scavenging area. But there was no study about this F_1 of Hilly chicken in Bangladesh. Conservation programmed with the indigenous Aseel and F_1 of Hilly chickens at the smallholder village levels (in-situ) of Bangladesh are yet to be tested. Such an initiative may help to save these creatures from the grip of the threat of extinction. The objective of this study was characterize and weight-gain up to sexual maturity of Aseel and F_1 of Hilly chicken.

2. Materials and Methods

2.1. Study Period

The experiment was conducted for a period of one year including 4 weeks adaptation period in farmers homestead in the Eastern part, Chattogram district between June 2008 and May 2009.

2.2. Study Location

The Aseel and F_1 of Hilly chickens were collected from the Sarail Upazila of Brahmanbaria district and hill tract regions of Bangladesh. Aseel and F_1 of Hilly chickens were randomly selected at the time of collection. Ten hens and ten cocks of both Aseel and F_1 of Hilly collected from the villages and local markets. The birds quarantined for 15 days and vaccinated against Newcastle disease before transferred in layer shed. The male and female chicken distributed in each pan at a ratio 1:1. The collected egg stored and hatched by electric incubator. The chicken was reared in captivity beside the Chattogram Veterinary and Animal Sciences University, Chattogram, Bangladesh.

2.3. Feeding of Chicken

The feed was supplied to the chicken was Paddy, broken Maize and Wheat, sometime mixed and sometime single. But ad libitum water was supplied for all time.

2.4. Collection of Data

Weight-gain same time mature live weight and other body measurement and morphological characteristics also be recorded. Data were collected from captive rearing chicken by directly physical visit to the captive rearing house. The following characters were recorded.

2.4.1. Phenotypic Characteristics

1. Several colors were estimated by direct close keen visual observation.
2. Lengths of several parameters were measured by measuring tape.
3. Weight of adult male and female was taken by using digital balance. Without this weight were collected several times, which were varied in several times.
4. Without this shape was detected by direct close and keen observation.

2.4.2. Weight-gain Up to Sexual Maturity

The body weight of 10 chicks from day-old to up to sexual maturity was weighed by using the digital balance as one month interval system.

2.4.3. First Laying Age

The first laying age of Aseel and Hilly chickens were detected from the day of hatched out of chicks to the date of first egg laid by the hen. And this first laying age considered here as age of sexual maturity.

2.5. Study Procedure

During the study period the captive rearing chicken was visited in weekly interval. But one of the chickens rarer was engaged for caring chicken every day and recording data properly. Most of the management practices were observed physically and required data were collected directly and from the record books in the house. The collected data were analyzed by using the statistical program of computer, Microsoft word, Microsoft Excel and STATA.

3. Results and Discussion

3.1. Phenotypic Characters

The average mature weight of Aseel male and female were found 4000 ± 94.99 gm and 2200 ± 67.82 gm (Table 1). The comb type of Aseel cock was found pea type whereas Aseel hen was found strawberry type. Shank color, yellowish white in case of Aseel cock but yellow in case of Aseel hen. White, thin, soft and oily skin of both male and female Aseel was recorded (Table 1).

Table 1. Phenotypic Characteristics of Aseel chicken.

Parameter	Male	Female
Mature Weight (gm)	4000 ± 94.99	2200 ± 67.82
Comb type	Pea type	Strawberry type
Size, Color of ear lobe	Prominent, Red	Rudimentary, Reddish white
Skin	White, thin, soft and oily	White, thin, soft and oily
Color of shank	Yellowish white	Yellow

Parameter	Male	Female
Color of egg	—	Light brown
Beak	Yellowish white, stocky and well curved	Reddish brown, stocky and well curved
Color of toe	Yellowish white	Yellow
Comb	Red, Deep red in upper portion, Prominent, (Single)	Red, Rudimentary (Strawberry)
Shank length (cm)	15.24±.22	10.79±.10
Length of sickle feather (cm)	26.67±.77	Absent
Pattern of sickle feather	Straight and downward	—
Length, color of wattle	Rudimentary, Red	Rudimentary, Red
Color of eye	Black	Black
Color of eye ring	White	White
Beak to tail length (cm)	73.66±.76	56.52±.53
Ground to head height (cm)	60.96±.43	48.26±.42

Length, color of wattle rudimentary, red and the color of eye and eye ring was found black and white in both male and female Aseel. The shank length, beak to tail length and ground to head height was found in case of Aseel male and

female 15.24±.22cm and 10.79±.10cm, 73.66±.76cm and 56.52±.53cm, 60.96±.43cm and 48.26±.42cm respectively. But the length of sickle feather was found 26.67±.77cm (Table 1).



Figure 1. Mature Aseel Male and Female.

The average mature weight of F₁ of Hilly chicken male and female were found 900±28.67 gm and 850±24.04 gm (Table 2). The comb type of F₁ of Hilly cock and hen was found was found same single comb type whereas comb color

was found red with prominent comb. Shank color, blackish yellow was found, in case of both male and female F₁ of Hilly chicken. White, thin, soft and oily skin of both male and female F₁ of Hilly was recorded (Table 2).

Table 2. Phenotypic Characteristics of F₁ of Hilly chicken.

Parameter	Male	Female
Mature Weight (gm)	900±28.67	850±24.04
Comb type	Single comb	Single comb
Size, Color of ear lobe	Rudimentary, Red	Rudimentary, Red
Skin	White, thin, soft and oily	White, thin, soft and oily
Color of shank	Blackish yellow	Blackish yellow
Beak	Blackish, stocky and well curved	Blackish, stocky and well curved
Color of toe	Blackish	Blackish
Comb	Red, Prominent	Red, Rudimentary
Shank length (cm)	8.89±.31	7.62±.35
Length of sickle feather (cm)	33.02±.46	Absent
Pattern of sickle feather	Upward	—
Length, color of wattle	Rudimentary, Red	Rudimentary, Red
Color of eye	Black	Black
Color of eye ring	Red	Red
Beak to tail length (cm)	54.46±.55	38.98±.53
Ground to head height (cm)	31.75±.62	25.4±.58

Length, color of wattle rudimentary, red and the color of eye and eye ring was found black and red in both male and female F₁ of Hilly. The shank length, beak to tail length and ground to head height was found in case of F₁ of Hillymale

and female 8.89±.31cm and 7.62±.35cm, 54.46±.55cm and 38.98±.53cm, 31.75±.62cm and 25.4±.58cm respectively. But the length of sickle feather was found 33.02±.46 cm (Table 2).



Figure 2. Mature F_1 of Hilly Male and Female.

3.2. Weight-Gain

The weight of Aseel chicken at day-old 31.69 gm and at the age of first lay was 1995gm (Figure 3).

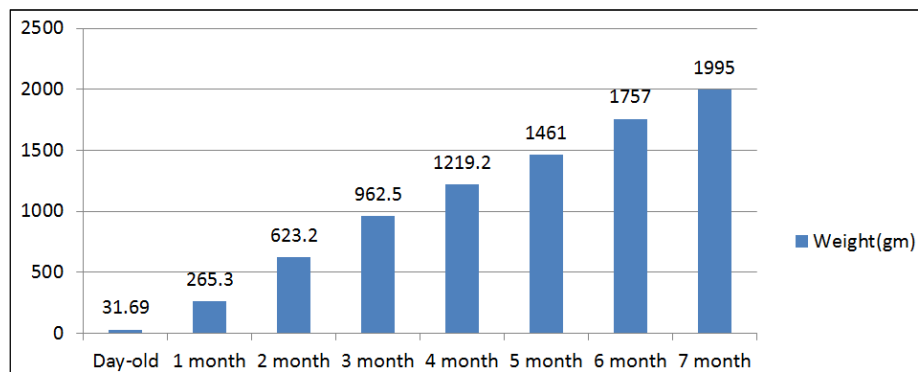


Figure 3. Weight-gain of Aseel chicks up to age of sexual maturity.

The weight-gain trend was found increasing and very good in case of Aseel chicken up to sexual maturity. The weight of F_1 of Hilly chicken at day-old 23.78gm and at the age of first lay was 850gm (Figure 4).

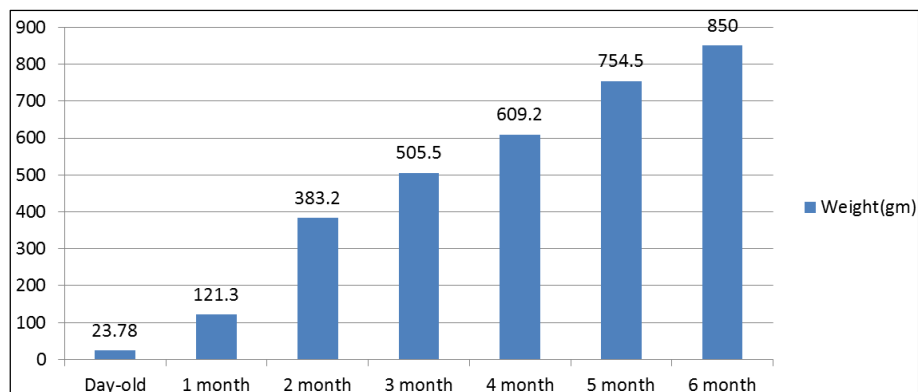


Figure 4. Weight-gain of F_1 of Hilly chicks up to age of sexual maturity.

The weight-gain trend was found increasing but not very good in case of F_1 of Hilly chicken up to sexual maturity.

3.3. Age at Sexual Maturity

The average age at sexual maturity of Aseel and F_1 of Hilly were 210 days and 180 days respectively (Table 3).

Table 3. First laying age (days) of Aseel and F_1 of Hilly chicken.

Location	Breed	
	Aseel	F_1 of Hilly
Chittagong	210	180

This observation indicated that F_1 of Hilly chicken attain early maturity compared to Aseel chicken.

4. Discussion

Adult live weight of Aseel male was found $3,749.12 \pm 83.44$ gm in case of male and in case of female it was found $2,062.50 \pm 105.26$ gm. The shank length was found 12.79 ± 0.13 cm and 10.21 ± 0.25 cm for male and female Aseel. On the other hand shank color was found yellowish and comb type was found Pea comb in male and Strawberry comb in female [12]. The variation in adult weight of Aseel male and female in present finding compared to past study results may be due to different in rearing system.

There was no past finding about F₁ of Hilly Chicken but some characteristics was found like Red Jungle fowl which were long sickle feather and eye ring color was red. One of the past study recorded that the weight of day old chicks of Hilly was found 28.56 gm and the body and shank length was found 37.12 cm and 9.20 cm. [4]. On the other hand [16] measured the shank length, bird's length and wing feather length of normal Deshi male and females. They observed shank length was 8.4 cm and 7.7 cm for male and female, bird's length was 50.5 cm and 46.8 cm for male and female and wing feather length was 17 cm and 16.3 cm for male and female. The body and shank length was found 37.12 cm and 9.20 cm. [4]. Variation of past finding and the present study results may be due to differences in chicken types and rearing system. Without this feed and weather condition also effect on size and weight of the chicken.

Aseel weight during different age are in close conformity with the earlier findings of Singh *et al.* (1999) who reported higher weights at day-old in Aseel (33 ± 0.30 gm) and Naked neck (34 ± 0.36 gm) chicks under farm conditions. The weight of day old chicks Aseel and Kadaknath chicken was found 33.19 ± 0.20 gm and 28.55 ± 0.12 gm and the weight of 20 weeks of age of Aseel chicken was recorded by [6], 1318.42 ± 22.24 gm. On the other hand at the age of 5 month Aseel gain 1461 gm weight which is higher than the past study result finding, this may be due to the differences in management system and weather condition. The weight of day old chicks of Hilly was found 28.56 gm but the weight of day old chicks of non-descriptive deshi, and naked neck chicken was found 29.23 gm and 29.49 gm [4]. Weight-gain differs for two breeds because of their differences in the genetic makeup as well as environment [9]. The higher weight-gain of Aseel chicks than that of F₁ of Hilly in this study is because of the former chicks has better adaptability in the environment of Bangladesh in both semi-scavenging and scavenging conditions and this is also heavier breed of chicken. Weight-gain differs for two breeds because of their differences in the genetic makeup as well as environment [9]. F₁ of Hilly chicks are not well adapted to surroundings environment because this breed has newly been developed to rear in Bangladesh. So due to lack of nutrition, this breed also suffers from several diseases, which resulted less weight-gain.

The findings of age and weight at sexual maturity of hilly chickens are agreement with the findings of [7], they observed the age at sexual maturity of hilly chickens were

160-195 days. The age at first lay of non-descriptive Deshi was 190-225 day [5]. The age at first laying age and sexually mature age Aseel chicken was recorded by [6], 176 days and 213.25 ± 0.54 days. The age at first egg was also found in case of hilly was 200 days and the age of first laying of non-descriptive Deshi and Naked neck chicken was found 22.44 week and 21.73 week respectively [4]. Sexual maturity of pullets may also be influenced by the factor like temperature, nutrition and lighting intensity [10, 15]. The average first laying age of Fayoumi was found 202 days was less than that of Sonali 220 days [11]. The age of sexual maturity differs in case of Aseel may be due to difference in weather condition as well as rearing system. But in case of F₁ of Hilly the differences in age of sexual maturity compared to Hilly and other Deshi types because of different genotypic makeup as well as environmental condition.

5. Conclusion

From close observation we found that Aseel chicken are highly vigorous in size but they are too much gentle, friendly, having tendency for fighting instant of fear. The average weight of mature male is 4000 ± 94.99 gm and female is 2200 ± 67.82 gm. There earlobe is red and they possess single comb in case of male and strawberry type comb in case of female and there shank color is yellowish white in male and yellow in female. The shank length and the total body length recorded in male and female $15.24 \pm .22$ cm and $10.79 \pm .10$ cm and $73.66 \pm .76$ cm and $56.52 \pm .53$ cm. On the other hand F₁ of Hilly chicken is small in size, not friendly, having capacity to fly. Mature male and female weight is 900 ± 28.67 gm and 850 ± 24.04 gm. There earlobe is red and they possess single comb and there shank color is blackish yellow. Length, color of wattle rudimentary, red and the color of eye and eye ring was found black and red in both male and female F₁ of Hilly. The shank length, beak to tail length and ground to head height was found in case of F₁ of Hilly male and female $8.89 \pm .31$ cm and $7.62 \pm .35$ cm, $54.46 \pm .55$ cm and $38.98 \pm .53$ cm, $31.75 \pm .62$ cm and $25.4 \pm .58$ cm respectively. But the male have nice sickle feather ($33.02 \pm .46$ cm) which is larger than the Aseel ($26.67 \pm .77$ cm). The average weight-gain of Aseel chicks after first laying age was (1995 gm) which was higher than that of F₁ of Hilly (850 gm). The first laying age of both Aseel and F₁ of Hilly were 210 and 180 days respectively. Phenotypic characteristics, weight-gain and environmental adaptation of Aseel chicks were better than F₁ of Hilly. So, the former breed is better for conservation issue than the later in the ex-situ conservation system.

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