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Growth Performance of Kasila Broiler Parent Stock Reared on Quantitative Feed Restriction under Bangladesh Condition

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Abstract: A total of 201 Kasila broiler parent chicks were reared in an open-sided house from one-day to 22 weeks of age and growth performance and uniformity were monitored. The birds were maintained on quantitative feed restriction and their adaptability was evaluated. The experimental period was divided into three phases, phase I (day-old to 2 weeks), phase II (3 to 8 weeks) and phase III (9 to 22 weeks). The birds were provided with identical care and management like feeding, watering, ventilation, lighting, vaccination and disease control programme. Female chicks followed standard growth and feed consumption curves very closely while, male followed standard growth curve irregularly. The body weight of females at the end of 2nd, 8th and 22nd weeks were slightly higher but close to the standard while, males were little higher at 2nd & 22nd week but little lower at 8th week. Body weight gain of both females and males were lower during 3 to 8 weeks and higher during 9 to 22 weeks of age. Kasila females exhibited acceptable uniformity ranges during the study period except at 20th week. But the males showed lower trends in uniformity in most of the growth period. The birds were more prone to Mycoplasmosis during the growing period in spite of adopting preventive measures including medication. Kasila broiler parents are adaptable under Bangladesh condition if environmental stress could be minimized by taking appropriate measures and following breeder's instructions.

Key words: Kasila, parent stock, standard weight, achieved weight

introduction

A good number of parent stocks having excellent genetic potentiality have been developed by breeders to augment production of commercial broiler chicks in the world but their performance varies from strain to strain and even within the same strain depending on the environment to which they are exposed. The parent stock growers are always interested to select a strain that is well adaptable under local condition and is capable of producing quality hatching eggs for the hatcheries in accordance with their inherent potentiality. Kasila is one of the broiler parent stock of Indian origin reared in India and Bangladesh. Kasila Farm Limited, the original breeder of the strain, established GPS by importing male and female lines from Hubbard Farms, USA. The response of Kasila broiler parent chicks in terms of growth performance resulting from feed allowances allocated to achieve target body weight has become an interest for parent stock growers. Body weight in poultry is one of the most important economic traits influenced by genetics, environment, management and feeding system. Most important indicators of broiler breeder performance during growing period is the achievement of body weight close to standard in relation to age and also their uniformity. Balanced diets and proper management would involve minimum cost and produce pullets of optimum weight with excellent uniformity. Broiler breeders are restricted both in quality and quantity from three weeks of age until the point of lay and then depending on rate of lay. Standard body weight of broiler parent stock at the onset of sexual maturity is associated with increased egg production (Hocking *et al*., 1987; Katanbaf *et al*., 1989a), lower mortality (Wilson and Harms, 1986; Ketanbaf *et al*., 1989b), improved fertility and hatchability (Bilgili and Render, 1985; Hocking, 1993). Although broiler parent stocks are raised by breeding farms for the production of quality chicks, data with regard to their growth pattern are scanty in research journals. Therefore, the objective of the study was to monitor growth performance i.e. body weight, body weight gain, feed intake and uniformity of Kasila broiler parent chicks resulting from quantitative feed restriction in an open-sided house and to compare these data with the standards and finally to assess their adaptability as well as welfare under Bangladesh condition.

Materials and Methods

Two hundred one Kasila broiler parent chicks were reared from one day-old to 22 weeks of age in an open-sided house at Bangladesh Agricultural University Poultry Farm during the period between late autumn and spring. The experimental period was divided into 3 phases, phase I (Day old to 2 weeks), phase II (3 to 8

weeks) and phase III (9 to 22 weeks). During phase I, straight-run chicks were divided into 3 replications each of 67 chicks. In phase II and phase III, female chicks were divided into 3 and 6 replications each of 52 and 23 chicks respectively. Male chicks were divided into 3 replications each of 8 chicks in phase II and phase III. The birds were provided with identical care and management and environmental conditions like feeding, watering, ventilation, lighting, vaccination and disease control measures were also identical. The house, feeders, waterers and other equipments were properly cleaned, washed and disinfected before use. Fresh dried sawdust was spread initially at a depth of 1.5 cm on the floor as litter material and gradually increased up to 5 cm. Litter was stirred occasionally to minimize dampness and cake formation. Chicks were subjected to 24 hours light during the first 14 days of life. From 2 weeks of age, light was gradually decreased daily and then maintained 12 hrs up to 19 weeks of age and then stimulated gradually up to 15 hours for the remainder of the experimental period. The lighting hours was adjusted depending on the day length. Additional artificial light was provided with natural day length to fulfill the required lighting hours.

The chicks were initially weighed and then weekly as straight-run chicks for the first 2 weeks of age and males and females were weighed separately from 3rd weeks to 22nd weeks of age. From day old to 2 weeks of age, the chicks were fed *ad libitum*. Feed restriction was started from the beginning of the 3rd week and it was continued up to end of the experimental period. Feed was supplied twice a day (morning and afternoon) from 3 to 8 weeks of age and then once in the morning up to 22 weeks of age. Feed management program was set for each week according to guide lines of the breeders considering the achieved body weight. When the average body weight was above target, no extra feed was supplied to the bird and standard feed allowance was maintained. One gram feed was increased for each 50 gram under weight birds when the body weight was below target. Switching over to grower diet from starter diet and pre-breeder diet from grower diet was dependent on the achievement of target body weight. Clean and cool water was provided to the birds *ad libitum*. Strict biosecurity measures were taken in and around parent shed during the experimental period. The birds were immunized against Infectious Bronchitis, Newcastle disease, Gumbro, Fowl Pox and Fowl Cholera. The stocking density of phase-I was 12 birds/m^2 and 4.5 birds/m^2 for male during phase II and III. For female, the stocking density was 9.3 and 4.1 birds/m^2 during phase II and III respectively. Debeaking was done for both male and female birds during phase I and only for female during phase II.

Record keeping and evaluation of data: Data on body weight, body weight gain, feed consumption, temperature, humidity, mortality and uniformity were recorded. Achieved body weight, real feed consumption and uniformity data were compared graphically against standards as suggested by the breeder.

Results and Discussion

Growth performance of females during phase I and II: The initial body weight of Kasila parent chicks was 36g. It was lower in comparison with other parent chicks (e.g. 49g of ISA 30 MPK). When achieved body weight was compared with standard body weight, it was found that the achieved body weight followed the standard curve very closely from 3 weeks and onwards (Fig. 1). The results agreed with Fattori *et al.* (1991) who found a similar trend in growth curve for Arbor Acres parent chicks. Body weight was slightly lower (9g to 16 g/bird lower) from 1st week to 7th week except at 2nd week (29g/bird higher) and at 8th week (7g/bird higher) when it was higher than standards (Fig. 1). However, the body weight of 2 to 8 weeks rearing period was within the standard body weight range except at 2nd week when it was only 6g higher than the target. Fig. 2 shows that feed consumption curve was very close to the standard and the chicks consumed only 2.64g (per bird/day) higher than the standard at 3rd week and 1.53 g/bird and 1.28 g/bird lower at 5th and 6th week respectively. During this period, there was a slight difference between standard and achieved body weight gain (Table 2). This result coincided with the findings of Kwakkel *et al.* (1991). During this time, the chicks were affected by coccidiosis. Strain *et al.* (1965) and Lee *et al.* (1971) also observed that restricted birds were more prone to coccidiosis during their early period of life.

Growth pattern of female during 9 to 22 weeks of age (phase III): Fig. 1 shows that the body weight was little lower (22g to 45g/bird) during 9th to 11th week and at 14th weeks of age as compared to standards. The body weight was very close to the standard at 12th, 13th and 19th weeks of age. The achieved body weight was lower at 14th to 18th week. The highest difference was 144g/bird lower at 16th week. The average body weight of birds at 20th week was 2305 g/bird. The body weight differed from the observation of Asuquo (1994) who found 2624g/bird at 20th weeks of age in 2 lines of Lohmann brown broiler parent. The achieved body weight at 22nd week was 140g higher than the standard. The result contradicts with the findings of Wilson and Harms (1986) who observed body weight 120g below the standard weight at 22 week in one experiment (experiment-1) and similar to standard in another experiment (experiment-2). Brake (1991) reported that half of the broiler breeder females were near the standard and remaining females were below the standard body weight at 22 weeks of age. Fig. 2 shows that the real feed consumption were little lower at 11th to 13th and 19th week and were little bit higher at 16th, 17th and 18th week. Birds consumed higher amount

Table 1: Body weight of Kasila broiler parent stock at different weeks

Age	Sex	Standard body weight (g/bird)	Standard body weight) range (g/bird	Achieved body weight (g/bird)
Day old	Straight- run chick	#	-	36
2 wks	Female	225	203-248	254
	Male	265	239-292	292
8 wks	Female	845	761-930	855
	Male	1010	909-1111	994
22 wks	Female	2500	2250-2750	2640
	Male	2963	2669-3262	3255

= Standard was not available

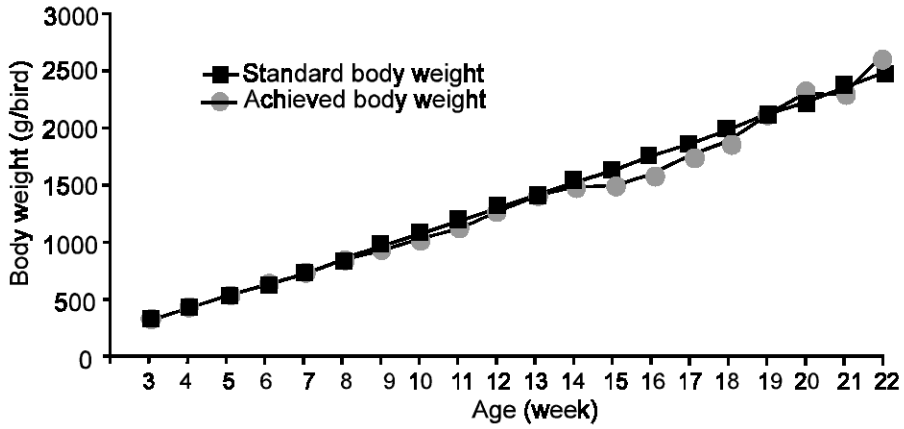

Fig. 1: Growth curve of Kasila female broiler parent chicks (standard Vs. achieved)

(7.66 g/bird more) of feed at 18th week. At 22nd week, the birds consumed 4% more feed which was similar with the finding of Powell and Gehle (1976) who found 2 to 4% more feed consumption at 22 weeks of age. The result indicates that except little exceptions, it is possible to obtain target body weight by feeding the birds according to the standard feed allocation.

Growth pattern of Kasila male broiler parent chicks during phase I & II: The body weight at first week was lower (32 g/bird lower) than the standard. This might be due to lower feed consumption (13.6 g/bird lower) during the first week. But at the end of 2nd week, chicks gained 27 g/bird more body weight than the standard. The results indicated that feed management influences feed consumption and body weight. The achieved body weight was lower (60 g/bird lower) than the standard at the end of 3rd week (Fig. 3). The growth curve showed little higher trend at the end of 7th week. During the period (3 to 8 weeks), achieved body weight was within the standard body weight ranges. The feed consumption followed the standard curve closely (Fig. 4). The results are consistent with the findings of Savory *et al.* (1996) who found similar weight gain in Ross 1 parent stock compared with the standard. During this period, the achieved body weight gain was slightly lower (43 g/bird lower) than the standard and the livability was 100%. The results indicate that it is possible to obtain target body weight by feeding the parent stock according to the standard feed allocation.

Growth pattern of Kasila male broiler parent chicks during 9 to 22 weeks of age (phase III): During phase III, achieved body weight curve showed a lower trend during 8 to 12 weeks and then upward trend up to 22 weeks except at 15th week (Fig. 3). The upward trend of body weight from the standard body weight was more clearly visible from 16th week to 22nd week, but it was always within the standard ranges except at 17th, 18th and 20th week, which were higher (283 g/bird to 429 g/bird). Achieved body weight shows maximum variations at 11th and 20th week of age (142 g/bird lower and 429 g/bird higher respectively). Pearson and Herron (1981) and Zhang *et al.* (1999) reported that there was no significant difference in body weight at 22 weeks of age than that of standard. The result of this study contradicts with the findings of Hocking (1988) and Strighini (1993) who reported that restricted feeding reduced body weight. But Vieira (1997) found no significant effect on body weight with different feed restriction programmes.

The real feed consumption curve was irregular during this period. Fig. 4 shows that the feed consumption was slightly lower (2 g to 5 g/bird) than the standards at 11th,

Table 2: Body weight gain of Kasila broiler parent stock at different phases

Phase	Age	Sex	Achieved body weight gain (g/bird)	Standard body weight gain (g/bird)
I	Day-old-2 week	Straight-run chick	223	#
II	3-8 week	Male	702	745
		Female	601	620
III	9-22 week	Male	2261	1955
		Female	1785	1655

= Standard was not available

Table 3: Feed consumption of Kasila broiler parent stock at different phases

Phase	Age	Sex	Real feed consumption (g/day/bird)	Standard feed allocation (g/day/bird)
I	Day-old -2 week	Straight-run chick	23	#
II	3 - 8 week Male		44	44
		Female	44	44
III	9 - 22 week	Male	79	77
		Female	80	77

= Standard was not available

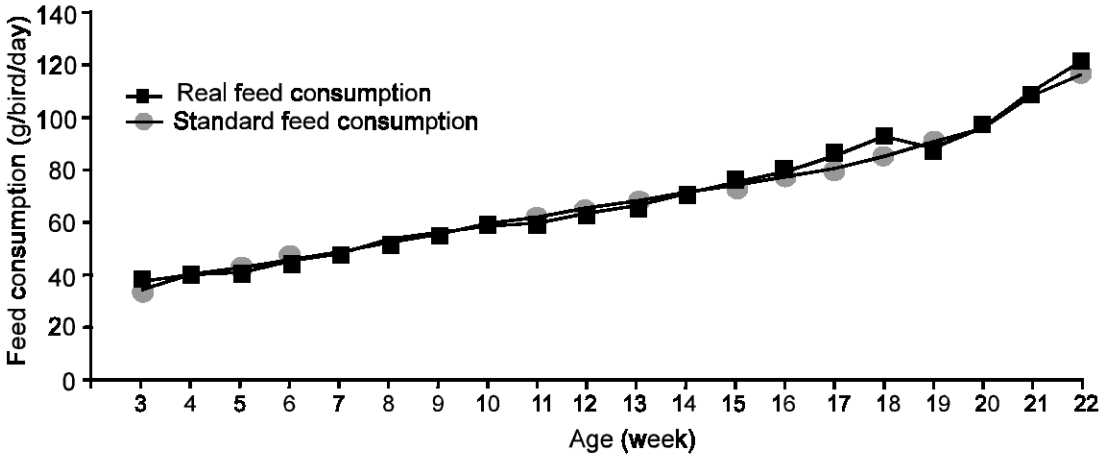

Fig. 2: Feed consumption of Kasila female broiler parent chicks (standard Vs. real)

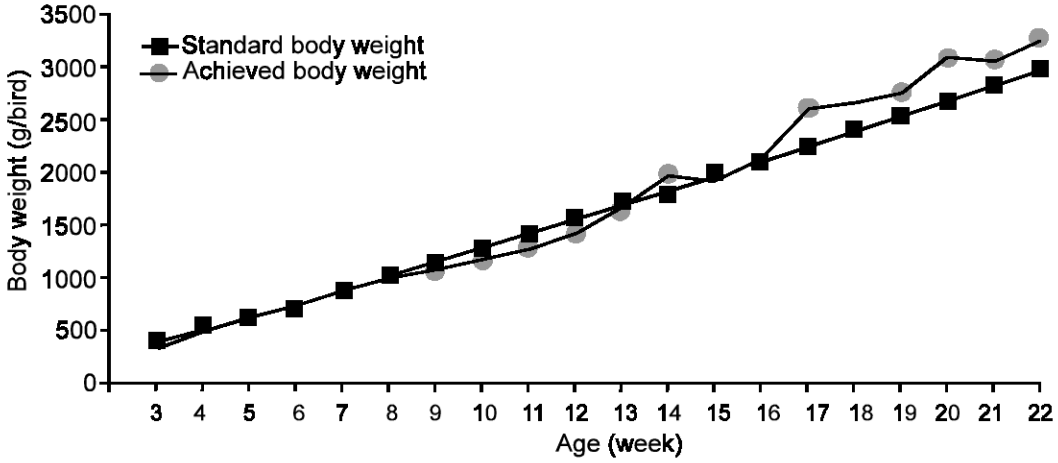

Fig. 3: Growth curve of Kasila male broiler parent chicks(Standard Vs. achieved)

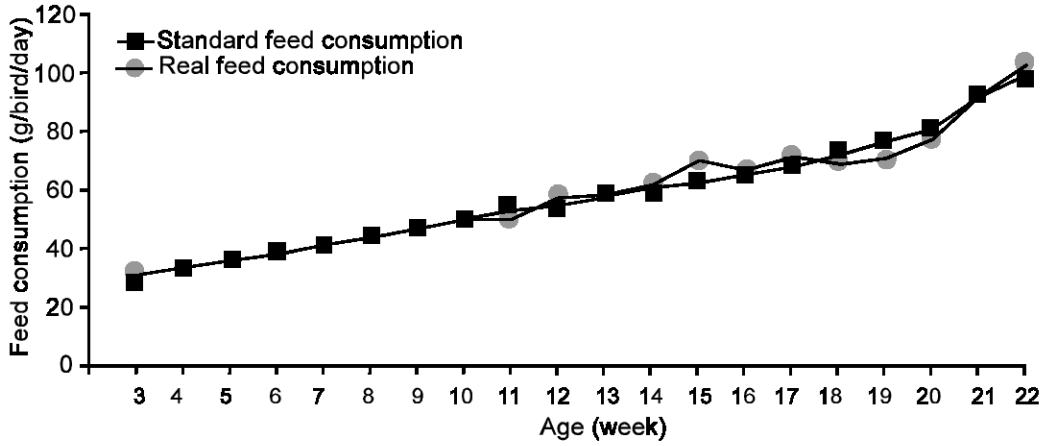

Fig. 4: Feed consumption curve of Kasila male broiler parent chicks (standard Vs. real)

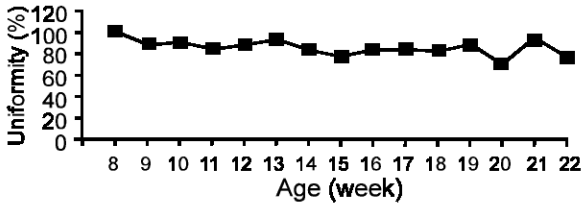

Fig 5: Uniformity curve of Kasila female broiler parent chicks

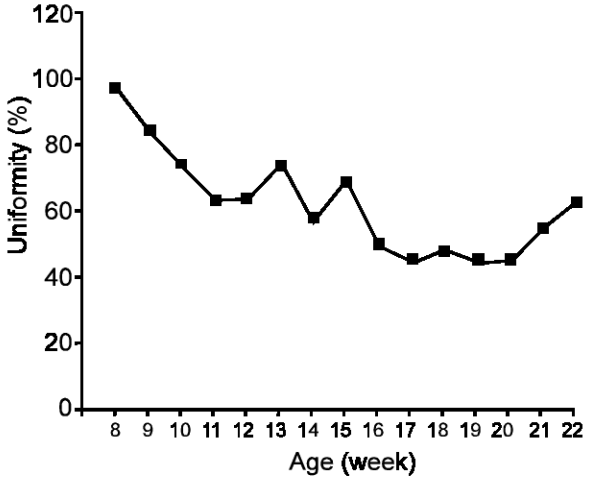

Fig. 6: Uniformity curve of Kasila male broiler parent chicks

18th and 20th week. The feed consumption was 6.9 g lower per bird at 19 weeks of age. The real feed consumption curve was higher during the rest of the week except at 9th and 10th week, which were very close to the standards. The highest amount of feed consumption was observed at 15th week. Fluctuation of growth curve was observed during this period, but this was not considerable. This result disagreed with Goerzen *et al.* (1996) who found considerable fluctuation of male growth curve. Feed consumption during this period showed no remarkable difference. The results once again suggest that target body weight could be obtained by standard feed allocation. During phase III, mortality of Kasila male and female chicks were higher due to Mycoplasmosis-Colibacillosis complex. The result agreed with the observation of Borges *et al.* (1999) who reported that the birds affected with Mycoplasmosis during rearing period increased mortality. However, the situation in this study was brought under control by proper medication. This indicates that Mycoplasmosis and Colibacilosis were the major disease problem affecting survivability of broiler parent chicks under Bangladesh condition.

Uniformity of Kasila broiler parent chicks: The uniformity of Kasila female parent chicks are shown in (Fig. 5). The uniformity of female birds over the period (8 to 22 weeks) were within the breeder's acceptable level (80% or above) except at 20th weeks of age. The highest uniformity was found at 8th week (99%) but Bartov *et al.* (1988) found higher uniformity at 11th week. The lowest uniformity was found at 20th week (69%) but Savory *et al.* (1996) found poor uniformity in female breeder at 22 week of age. Fig. 6 shows that the uniformity of Kasila male broiler breeder chicks were within the acceptable weight ranges (80%) at 8th, 9th, 10th and 13th week. The 100% uniformity was found at 8th week. The uniformity curve went downward after 15 weeks of age. It was slightly increased from 20th week to end of the period but failed to reach the acceptable level. The fluctuation of uniformity curve was higher during this period because of their illness (Mycoplasmosis) when more feed was supplied (2 to 5g/bird excess). Results of the present study coincide with the findings of Fattori *el al.* (1991) who found poorer uniformity during rearing period.

The results indicated that Kasila broiler parents are adaptable under Bangladesh condition in late autumn and spring but the birds specially the males are very sensitive to extreme cold and diseases. It might be suggested that efficient heating device and strict biosecurity coupled with an effective vaccination program are the keys for successful growing.

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