



Growth and Mortality Patterns in Uttara fowl

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ABSTRACT

A study was conducted to evaluate the growth and mortality pattern of 275 chicks of two ecotype viz., comb and crown sex wise which were obtained in six hatches at Instructional Poultry Farm of G.B.P.U.A. & T., Pantnagar. In the present study overall mortality in a period of 24th weeks in comb female and crown female ecotypes were 12.6 and 10.4 per cent, while in comb male and crown male were 8.5 and 6.8 per cent, respectively. There was no significant ($P < 0.05$) difference of day old body weight of the chicks between two ecotypes of Uttara fowl. The results revealed that there was significant ($P < 0.05$) difference in body weight at 4th and 12th weeks of age between the male comb and crown ecotypes of Uttara fowl. Also there was significant ($P < 0.05$) difference in 16th weeks body weight between the female comb and crown ecotypes of Uttara fowl. Significant ($P < 0.05$) differences in 20th and 24th weeks body weights between the males of crown and comb ecotypes of Uttara fowl as well as in female of both ecotypes. Highest 24th week body weight was found in comb male (1780.18 ± 34.69) than the crown male (1699.43 ± 33.49) followed by crown female (1484.22 ± 19.22 g) than the comb female (1389.12 ± 18.85 g). Average body weights at first egg in comb and crown ecotypes of Uttara fowl differed significantly from each other. Thus Uttara fowl has lower mortality rate and comparable body weights with that of other indigenous breeds of chicken.

Keywords: Body Weight, Comb type, Crown type, Mortality, Uttara fowl

Poultry is the only sector of animal Husbandry which has seen a growth of 12.39% in 19th livestock census as compared to 18th livestock census and has taken a shape of industry. The poultry meat and egg production in India is estimated to be 3.26 million tonnes and 6.93 billion respectively in 2015-16 (DAHD, 2017). Due to indiscriminate crossbreeding for improvement in indigenous breeds has made their purity questionable (Tharkur *et al.*, 2006). To preserve native chicks, there is need for identification, characterization and conservation. Uttara fowl is found in Kumaon region of Uttarakhand with appreciable degree of disease resistance compared to exotic in its natural habitat in free range. Uttara fowl also possess resistance to cold winter stress and thrives well under adverse environments like poor housing, poor management and poor feeding. The predominant colour of Uttara fowl is black with crest/crown and comb type structure on head and feathery shanks. Uttara fowl is

popular among marginal farmers, tribals etc. in hilly regions of Uttarakhand and reared under traditional system. Since this germplasm is unexplored and possess various potential gene combinations responsible for survival in tough conditions of Uttarakhand, there is very little information available on characteristic of Uttara fowl. So the present study was undertaken to study growth and mortality patterns of Uttara fowl.

MATERIALS AND METHODS

Present experiment was carried out at the Instructional Poultry Farm, Nagla of College of Veterinary & Animal Sciences, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar which is situated at 29°N, latitude, 79.3° E longitude and at the altitude of 243.8 meter above mean sea level in foot hill of Himalayas. This area represents the humid subtropical climate with hot humid and cold winter. The experiment was conducted

on two ecotypes i.e Crown and Comb ecotypes of Uttara fowl (Fig. 1, 2) at Instructional Poultry Farm of College of Veterinary & Animal Sciences.



Fig. 1: Crown ecotypes of Uttara fowl (male & female)



Fig. 2: Comb ecotypes of Uttara fowl (male & female)

A total of 275 chicks of the Uttara fowl were generated in 6 hatches out of which there were about 123 and 152 chicks of combs and crown ecotype respectively. Out of 123 comb ecotypes, 57 male and 66 female were taken and from 152 crown ecotypes 58 male and 94 female were taken to study the egg quality traits. The birds used for the experiment were housed under deep litter system with an open-sided house with curtains hanging from the outside during the brooding period. All the housing and managerial conditions were similar for different breeding groups under study. Standard management practices were followed during the brooding, growing, and laying stages. All birds were vaccinated against

Ranikhet disease. Baby Chick Ranikhet Disease Vaccine (BCRDV) was administered one drop in each eye at 4th and 25th days of chicken and at 14th day for Infectious Bursal Disease. Birds were transferred to individual layer cages in the open-sided house at about same age, when the first egg in the flock was noticed. The standard feeding and management practices were adopted during experiment and veterinary care was also provided as and when required. The chicks were provided with *ad libitum* chick starter ration (2,600 kcal/kg of ME and 20% CP on a calculated basis) up to 8 week of age, grower ration (2,500 kcal/kg of ME and 16% CP on a calculated basis) from 9 to 20 week of age, and layer ration (2,600 kcal/kg of ME and 18% CP on a calculated basis) from 20 week onward. The chicks from each group were weighed individually with the help of weighing balance up to 0.1 g accuracy at day old, 4th, 6th, 8th, 12th, 16th, 20th and 24th week of age. Sex-wise body weight was recorded up to 24th week of age. Body weight at first egg laying was also recorded in two different ecotypes viz. crown and comb types of Uttara fowl

RESULTS AND DISCUSSION

Mortality

In any poultry farm livelihood of birds is an important economic factor. Lesser the mortality more is the profit. In the present study overall mortality in a period of 24th weeks in comb female and crown female ecotypes were 12.6 and 10.4 percent, while in comb male and crown male were 8.5 and 6.8 percent, respectively. The mortality observed in present study were found lower than the report of Aggarwal *et al.* (1971) in RIR, desi, RIR × desi and desi × RIR birds, Ali *et al.* (1981) in R.I.R., Australorp and Aseel, Gupta *et al.* (2006) in indigenous birds, Halima *et al.* (2006) in RIR, and Khawaja *et al.* (2012) in RIR, Fayoumi, RIR × Fayoumi and Fayoumi × RIR, respectively.

Day old body weight

Average day old body weights of chick at hatching in different ecotypes have been presented in Table 1. There was no significant ($P < 0.05$) difference of day old body weight of the chicks between two ecotypes of Uttara

Table 1: Least-squares means (\pm SE) of body weights at different ages in different ecotypes of Uttara fowl

Age(weeks)	Body weights (g)			
	Female		Male	
	Comb	Crown	Comb	Crown
Day old	36.71 \pm 0.52 (11.38)	36.86 \pm 0.39 (9.99)	37.92 \pm 0.68 (13.46)	36.98 \pm 0.58 (11.47)
4 th	126.12 \pm 3.07 (19.49)	130.84 \pm 2.62 (18.91)	160.34 \pm 6.16 ^a (28.51)	146.43 \pm 5.83 ^b (28.99)
8 th	406.71 \pm 7.09 (13.94)	413.34 \pm 7.55 (17.24)	458.32 \pm 7.51 (12.16)	445.03 \pm 9.59 (15.6)
12 th	684.51 \pm 10.94 (12.79)	716.50 \pm 11.69 (15.39)	852.98 \pm 17.67 ^a (15.37)	810.32 \pm 16.35 ^b (14.69)
16 th	954.82 \pm 18.00 ^b (15.08)	1018.78 \pm 13.33 ^a (12.34)	1227.78 \pm 22.04 (13.31)	1180.98 \pm 25.07 (15.45)
20 th	1175.85 \pm 17.67 ^b (12.02)	1271.59 \pm 17.61 ^a (13.06)	1571.63 \pm 32.00 ^a (15.13)	1435.39 \pm 25.66 ^b (13.01)
24 th	1389.12 \pm 18.85 ^b (10.86)	1484.22 \pm 19.22 ^a (12.22)	1780.18 \pm 34.69 ^a (14.45)	1699.43 \pm 33.49 ^b (14.34)

Values given in parenthesis represent coefficient of variation; Values having different superscripts in the same row differ significantly ($p < 0.05$) with each other.

fowl, though the results showed a higher chick weight at hatching in comb male (37.92 \pm 0.68 g) and crown male (36.98 \pm 0.58 g) followed by crown female (36.86 \pm 0.39g) and comb female (36.71 \pm 0.52 g). The variation in chick body weights may be due to their genetic potential and environmental action. The higher body weight at day old of age under study indicated that these two ecotypes of Uttara fowl have genetic potential for further improvement for this trait. The average day old male and female chick body weight in two ecotypes of Uttara fowl under study was higher than those reported by Thakur *et al.* (2006), in Kadaknath, Sharma and Narayankhedkar (2004) in crosses of Kadaknath \times Rhode Island Red, Sharma (2009) in Local hill fowl, Singh *et al.* (2009) in Ankaleshwar, Faruque *et al.* (2010) in Non-descript Desi, Hilly and Naked Neck, Pushkar (2013) in comb and crown variety of Uttara fowl. The average day old chicks male and female body weight of comb and crown ecotypes of Uttara fowl under study was found lower than the reports of Bhardwaj *et al.* (2006) in Brown Cornish. The present study results were in agreement

with the reports of Kumar and Singh (2008) in Local hill fowl.

Body weight at 4th week of age

Average 4th weeks body weights in comb and crown ecotypes have been presented in Table 1. The results revealed that there was significant ($P < 0.05$) difference in 4th weeks body weight between the male comb and crown ecotypes of Uttara fowl. The results revealed higher 4th week body weight in comb male (160.34 \pm 6.16 g) followed by crown male (146.43 \pm 5.83 g) whereas it was found higher in crown female (130.84 \pm 2.62 g) than comb female (126.12 \pm 3.07 g). The values in the present study were higher than as reported by Thakur *et al.* (2006) in Kadaknath, Sharma *et al.* (2009) in Local hill fowl. The result obtained in present study was found lower than the reports of Singh *et al.* (2009) in Ankaleshwar and Pushkar (2013) in Uttara fowl. The differences in body weights at 4th weeks of age may be due to the genetic reason and which can be improved by further selection and suitable breeding program.

Body weight at 8th week of age

Average 8th weeks body weights of both sexes have been presented in Table 1. Analysis of variance showed no significant ($P<0.05$) differences in between two ecotypes of Uttara fowl. The 8th week body weights in comb male and crown male was 458.32 ± 7.51 and 445.03 ± 9.59 g, respectively. While higher body weight was reported in crown female (413.34 ± 7.55 g) than comb female (406.71 ± 7.09 g) of Uttara fowl. The mean 8th weeks body weights reported in both sexes of two ecotypes of Uttara fowl was higher than the reports of Kaur (2007) and Sharma (2009) in local hill fowl. The result obtained in present study was found lower than the reports of Azharul *et al.* (2005) in Sonali and Fayoumi except male comb ecotype of Uttara fowl, whereas the value recorded by Pushkar (2013) in comb ecotype of Uttara fowl was higher from the present study but the value of crown ecotypes are found lower than the crown and comb male ecotypes of Uttara fowl from the present study.

Body weight at 12th week of age

Average 12th weeks body weights in comb and crown ecotypes for both sexes have been presented in Table 1. The results revealed that there was significant ($P<0.05$) difference in 12th weeks body weight between the male crown and comb ecotypes of Uttara fowl. The results revealed higher 12th week body weights in comb male (852.98 ± 17.67 g) than crown male (810.32 ± 16.35 g) whereas crown female has higher body weights i.e. 716.50 ± 11.69 g than the comb female (684.51 ± 10.94 g). These values in the present study was found higher than as reported by Kaur (2007), Sharma *et al.* (2009) in local hill fowl, Thakur *et al.* (2006) in Kadaknath, Kumar and Singh (2008) in Local hill fowl. Whereas the average value of estimated 12th week body weight in present study were found in agreement with the findings of Pushkar (2013) in crown variety of Uttara fowl and Enaiat *et al.* (2010) in Silver Montazah and Matrouh. The present study was found lower than the reports of Lwelamira *et al.* (2008) in Kuchi. The higher values for both of the sexes of both ecotypes need attention for selection and suitable breeding program for development of good germplasm.

Body weight at 16th week of age

Average 16th weeks body weights in comb and crown

ecotypes for both sexes have been presented in Table 1. The results revealed that there was significant ($P<0.05$) difference in 16th weeks body weight between the female comb and crown ecotypes of Uttara fowl. The results revealed higher 16th week body weight was reported in comb male (1227.78 ± 22.04 g) than the crown male (1180.98 ± 25.07 g) and crown female (1018.78 ± 13.33 g) than the comb female (954.82 ± 18.00 g). The results further indicated that proper selection and breeding of these ecotypes will be helpful for further development of this germplasm. These values in the present study was higher than as reported by Sharma *et al.* (2009) in local hill fowl, Thakur *et al.* (2006) whereas the value reported by Jha and Prasad (2013) in Vanaraja and Gramapriya were higher from the present study.

Body weight at 20th week of age

Average 20th weeks body weights of males and females different ecotypes have been presented in Table 1. The results revealed that there was significant ($P<0.05$) difference in 20th weeks body weight between the males of crown and comb ecotypes of Uttara fowl as well as in female of both ecotypes. The results revealed that 20th week body weight was 1571.63 ± 32.00 g in comb male and 1435.39 ± 25.66 g in crown male whereas in 1175.85 ± 17.67 g in comb female and 1271.59 ± 17.61 g in crown female, respectively. The average 20th weeks body weights in comb and crown ecotypes has been found lower than those reported by Halima *et al.* (2006) in RIR, Jha and Prasad (2013) in Vanaraja and Gramapriya. Whereas the values obtained under study were found higher than reported by Thakur *et al.* (2006), Sharma *et al.* (2009) in Local hill fowl. Kumar and Balvir (2008) finding in local hill fowl at 20th week of age are higher from the comb and crown female ecotypes of Uttara fowl but lower value from the male of different ecotypes of Uttara fowl. This may be because of environmental factor operating at that time.

Body weight at 24th week of age

Average 24th weeks body weights of males and females different ecotypes have been presented in Table 1. The results revealed that there was significant ($P<0.05$) difference in 24th weeks body weights between the males of crown and comb ecotypes as well as females of both ecotypes of. The results revealed that higher 24th week

body weight in comb male (1780.18±34.69) than the crown male (1699.43±33.49) followed by crown female (1484.22±19.22g) than the comb female (1389.12±18.85 g).

Table 2: Least-squares means (±SE) of body weight and age at first egg in different ecotypes of Uttara fowl

Ecotypes	Age at first egg (days)		Body weight at first egg (g)	
	Mean±S.E.	C.V.	Mean±S.E.	C.V.
Comb	171.05±2.18 ^b	5.7	1350.40±35.35 ^b	11.7
Crown	161.5±3.05 ^a	8.4	1422.50±31.21 ^a	9.8

Values having different superscripts in the same column differ significantly ($p < 0.05$) with each other.

The value of the female and male of different ecotypes in the present study was higher than as reported by Singh *et al.* (2009) in Ankaleshwar female and male whereas Haunshi *et al.* (2011) in Aseel also reported higher male body weights than the corresponding male value found under the present study but lower value was recorded by them in Kadaknath. Thus, result showed that these ecotypes have potential for further genetic improvement.

Body weight at first egg

Average body weights at first egg in comb and crown ecotypes of Uttara fowl have been presented in Table 2. Average body weights at first egg in comb and crown ecotypes of Uttara fowl were found significantly differed from each other and were found as 1350.40±35.35 and 1422.50±31.21 g, respectively with coefficient of variation 11.7 and 9.8 percent, respectively. The average body weight at first egg in comb and crown ecotypes of Uttara fowl under study was found higher than the reports of Faruque *et al.* (2013) in hilly (H) and naked neck (NN) (1228.6±154.1 and 1154.8±95.2 g, respectively and Chatterjee (2013) in Nicobari fowl (1276±54 g) respectively. The differences in weight at sexual maturity can be due to differences in genetic makeup of Uttara fowl.

CONCLUSION

Thus Uttara fowl has lower mortality rate and comparable body weights with that of other indigenous breeds of chicken.

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