

Study on the Performance of Different Genotypes of Ducks under Village Condition

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ABSTRACT : Thirty adults *Desi* and Khaki Campbell ducks were distributed to 6 farmers of Chakcharpur village of Mymensingh district. These ducks were subjected 3 types of mating e.g. *Desi* × *Desi*, Khaki Campbell × Khaki Campbell and Khaki Campbell × *Desi*— having 10 ducks (male:female = 1:4) in each mating group. Each mating group was then divided into two having 5 ducks (male:female = 1:4) and distributed to 2 farmers. After collecting eggs from each mating category, these were hatched by broody hens from which a total of 90 day old ducklings, 30 from each genotype were raised from birth to 90 days after the onset of laying. Although the weight of the day old chicks were similar in all genotypes (40-43 g), body weight was the highest ($p < 0.01$) for Khaki Campbell × *Desi* (1,543 g) before the onset of laying followed by Khaki Campbell (1,522 g) and *Desi* (1,448 g) ducks. Khaki Campbell attained maturity at an earlier ($p < 0.01$) age (147 days) followed

by Khaki Campbell × *Desi*, (154 days) and *Desi* (161 days) ducks. Khaki Campbell laid maximum ($p < 0.01$) number of eggs (46) compared to Khaki Campbell × *Desi*, (30) and *Desi* (18) ducks 90 days after the onset of laying. However, eggs were heavier ($p < 0.01$) in *Desi* (61.9 g) ducks compared to other genotypes. Fertility and hatchability were also higher in *Desi* ducks than the other two genotypes. Mortality was also lower in *Desi* ducks (3.33%) followed by Khaki Campbell × *Desi* (6.66%) and Khaki Campbell (16.66%) ducks. The results presented here indicated the superiority of *Desi* ducks over the other two genotypes with respect to egg weight, fertility, hatchability and mortality under village condition. Pure and crossbreds, on the other hand, were heavier at sexual maturity at relatively younger age and laid more eggs.

(Key Words : Genotypes, *Desi*, Khaki Campbell, Cross Breeding)

INTRODUCTION

Duck is a promising species of poultry in Bangladesh. Nevertheless, it was neglected in the past (Hossain, 1989; Magor, 1986). Attention has been paid now-a-days, to improve this bird through changing genotypes as well as providing better environment because *Desi* (indigenous or local) ducks are poor producer and lay only 60-80 eggs per bird per year against 250-300 eggs of exotic ones (Ukil and Islam, 1991; Sazzad, 1988; Salam and Uddim, 1987). Despite higher productivity, it is generally assumed that the exotic ducks as well as their crossbreds are susceptible to diseases and parasites. Subjected to the adaptability tests, exotic breeds of ducks and their crossbreds can be raised under local condition of Bangladesh. Literature this aspect in Bangladesh is scant because only a few studies so far has been done on

comparative performances of *Desi*, exotic and their crossbreds in village condition (Hossain, 1989).

The study was, therefore, taken to compare the productive and reproductive potentialities of *Desi*, Khaki Campbell and their crossbreds under village condition of Bangladesh.

MATERIALS AND METHODS

The experiment was conducted in Chakcharpur of Mymensingh Sadar, Bangladesh for a period from November 1988 to March 1990. A total of 30 adult Khaki Campbell and *Desi* ducks were purchased from Bangladesh Agricultural University Poultry Farm and local markets of Mymensingh Sadar respectively. These ducks were divided into 3 mating groups for natural mating such as *Desi* × *Desi*, Khaki Campbell × Khaki Campbell and Khaki Campbell × *Desi* having 2 males and 8 females in each group.

Each mating group was then distributed to 2 farmers having 5 ducks (male:female = 1:4) for each farmer (table 1). A total of 150 eggs, 50 from each mating group

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were collected and hatched by broody hens. After brooding, 90 ducklings-30 from each genotype were taken and raised under traditional system of feeding, rearing and management practiced by the villagers. However, besides traditional feeding, the ducks were provided with some supplemental diets (table 2). Data were taken up to 90 days after the onset of laying. Day old weight of chick and fourth weekly weight was recorded. Age and weight

of ducks at sexual maturity were recorded. Daily egg production records of different genotypes from laying of first egg up to the period of 90 days were recorded in nearest gram (g). Regarding fertility of eggs, unhatched eggs were broken to determine their fertility after each hatching. Eggs with dead germ cells including the hatched out eggs were considered as fertile.

Table 1. Mating system of ducks

Mating group	Farmer group	Ducks		Total ducks
		Male (n)	Female (n)	
M ₁	F ₁	<i>Desi</i> (1)	<i>Desi</i> (4)	5
		<i>Desi</i> (1)	<i>Desi</i> (4)	5
M ₂	F ₂	Khaki Campbell (1)	Khaki Campbell (4)	5
		Khaki Campbell (1)	Khaki Campbell (4)	5
M ₃	F ₃	Khaki Campbell (1)	<i>Desi</i> (4)	5
		Khaki Campbell (1)	<i>Desi</i> (4)	5

Table 2. Composition of supplemental diets

Ingredients	Amount (kg)	Crude Protein (%)	Metabolizable energy (kcal kg ⁻¹)
Wheat crushed	50.0	5.00	1,625
Rice polish	28.0	3.36	784
Til oil cake	8.0	2.80	208
Fish meal	10.0	4.50	264
Oyster/egg shell	3.5	—	—
Common salt	0.5	—	—
Total	100	15.66	2,881

Fertility of the eggs was calculate in percentage. Hatchability of the eggs was calculated in percentage on the basis of number of eggs set for incubation and number of ducklings hatched. Mortality of ducklings was recorded as and when occurred.

Data were analysed in Randomized Block Design (RBD) except the data on mortality which was analysed following Chi-square test. Least significant difference was done to identify the significant means. All statistical analysis was done following Steel and Torrie (1980).

RESULTS AND DISCUSSION

Body weight of different genotypes

The weight of day old duck was slightly higher ($p > 0.05$) in *Desi* ducks (43 g) followed by Khaki Campbell

× *Desi* (42 g) and Khaki Campbell ducks (40 g). At the end of the first fourth week, the body weight of Khaki Campbell × *Desi* ducks (175 g) was highest ($p < 0.01$), while there were no differences between Khaki Campbell (162 g) and *Desi* (158 g) ducks. At the end of the 20th week, the weight of Khaki Campbell (1,543 g) was the highest ($p < 0.01$) followed by Khaki Campbell (1,522 g) and *Desi* (1,448 g) ducks (table 3). After that period, all of the ducks came into production.

Age and weight at sexual maturity

The mean age at sexual maturity of different genotypes of ducks was 161, 147 and 154 days for *Desi*, Khaki Campbell and Khaki Campbell × *Desi* respectively (table 4). Age at sexual maturity was the lowest ($p < 0.01$) in Khaki Campbell ducks compared to

the *Desi* and their crosses. Early sexual maturity in Khaki Campbell duck may be attributed to the inherent potentialities of the breed which agreed with the results of Huque and Haque (1991). The mean weight at sexual maturity was 1,560, 1,620 and 1,683g for *Desi*, Khaki Campbell and Khaki Campbell \times *Desi*, respectively. The highest ($p < 0.01$) weight at sexual maturity was found for Khaki Campbell \times *Desi* followed by Khaki the heterotic effect of the character under study (Jalil, 1990). The result also agreed with Huque and Haque (1991).

Table 3. Mean and standard error of body weight of different genotypes of ducks at different periods

Age	Genotypes		
	<i>Desi</i>	Khaki campbell	Khaki campbell \times <i>Desi</i>
Day old	43.0 \pm 3.49	40.0 \pm 1.87	42.0 \pm 1.77
4th week	158.0 \pm 3.52 ^b	161.5 \pm 38.78 ^a	174.8 \pm 8.66 ^a
8th week	451.5 \pm 18.89 ^b	467.5 \pm 38.78 ^{ab}	483.5 \pm 14.57 ^a
12th week	846.0 \pm 24.15 ^b	866.8 \pm 27.63 ^{ab}	875.6 \pm 42.43 ^a
16th week	1,197.0 \pm 14.42 ^b	1,206.0 \pm 14.42 ^{ab}	1,220.0 \pm 39.10 ^a
20th week	1,448.0 \pm 39.56 ^c	1,522.0 \pm 29.83 ^b	1,543.0 \pm 14.18 ^a

^{abc}Means having dissimilar superscripts in the same row differs significantly ($p < 0.01$).

Table 4. Performances(mean \pm SE) of different genotypes of under village condition

Parameters	Genotypes		
	<i>Desi</i> \times <i>Desi</i>	Khaki campbell \times Khaki campbell	Khaki campbell \times <i>Desi</i>
Age at laying (days)	161.0 \pm 13.4 ^a	147.0 \pm 2.64 ^c	154.0 \pm 2.04 ^b
Weight at sexual maturity (g)	1,560.0 \pm 9.57 ^c	1,620.0 \pm 12.42 ^b	1,683.0 \pm 12.4 ^a
Egg production (no's; 90 days)	18.2 \pm 1.53 ^c	45.6 \pm 1.58 ^a	30.3 \pm 1.33 ^b
Egg weight (g)	61.9 \pm 0.84 ^a	57.0 \pm 0.78 ^c	60.5 \pm 0.50 ^b
Fertility (%)	85.33 \pm 1.68	82.66 \pm 1.43	83.33 \pm 0.97
Hatchability (%)	85.03 \pm 1.05 ^a	77.42 \pm 0.96 ^c	83.2 \pm 1.17 ^b
Mortality (%)	3.33	16.66	6.66

^{abc}Means having dissimilar superscripts in the same row differs significantly ($p < 0.01$).

Egg production

The average number of eggs produced by *Desi*, Khaki Campbell and Khaki Campbell \times *Desi* 90 days after the onset of laying were 18, 46 and 30 eggs respectively (table 4). Khaki Campbell produced the highest ($p < 0.01$) number of eggs compared to the other genotypes of which *Desi* had the lowest production. Like the age at sexual maturity, Khaki Campbell ducks possessed the inherent capability of producing more eggs compared to other genotypes, although Huque and Hossain (1991) observed higher egg production in Khaki Campbell \times *Desi* ducks.

Egg weight

Egg weight of *Desi*, Khaki Campbell and Khaki Campbell \times *Desi* were 61.9, 57.0 and 60.5 g respectively

(table 4). From the results, it was observed that the egg weight of *Desi* ducks was the highest ($p < 0.01$) followed by Khaki Campbell \times *Desi* and Khaki campbell respectively. Huque and Hossain (1991) observed similar egg weight of Khaki Campbell (55.85 g) though they observed much lower egg weight for *Desi* (52.27 g) and Khaki Campbell \times *Desi* (52.92 g) ducks. The result of the study indicated that the *Desi* ducks have good genetic potential for the trait, egg weight.

Fertility

Fertility of different genotypes of ducks is also presented in table 4. The average fertility of *Desi*, Khaki Campbell and Khaki Campbell \times *Desi* egg was 85.33, 82.66 and 83.33% respectively. Though higher fertility was observed in the *Desi* ducks, there was

no difference between the genotypes for fertility. Hamid et al (1988) observed similar fertility level for Khaki Campbell ducks (82.5%) but they observed comparatively lower fertility for the *Desi* ducks (78.75%) than the present study.

Hatchability

Hatchability of *Desi*, Khaki Campbell and Khaki Campbell \times *Desi* ducks averaged 85.03, 77.42 and 83.20% respectively (table 4). Like fertility, hatchability was the highest ($p < 0.01$) for *Desi* ducks followed by Khaki Campbell \times *Desi* and Khaki Campbell ducks which was the lowest. Hamid et al. (1988) however, found lower hatchability of *Desi* (65.5%) and Khaki Campbell (67.88%) ducks than the present study. Higher hatchability of eggs in the present study may be that the eggs were hatched by natural incubation (by broody hens) while Hamid et al. (1988) hatched their eggs by artificial incubation.

Mortality

Mortality of different genotypes of ducks is given in table 4. Mortality from the onset of hatching up to 90 days of laying period was lower in *Desi* ducks (3.33%) followed by Khaki Campbell \times *Desi* (6.66%) and Khaki Campbell (16.66%) ducks but chi-square test reflected no differences in mortality between genotypes. Nevertheless, the data indicates that the *Desi* ducks to be more resistant to diseases and parasites and can be adapted to adverse conditions than those of exotic and crossbred ones. The results on mortality agreed with the results of Hamid et al. (1988) where they found lower mortality in *Desi* ducks.

CONCLUSION AND RECOMMENDATION

The results presented in the paper reflected the superiority of *Desi* ducks under village conditions over other two genotypes (Khaki Campbell and their crossbreds) in many of the investigated characteristics. However, *Desi* ducks were inferior to Khaki Campbell and their crosses for age and weight at sexual maturity and egg production. They were, however, superior to different reproductive characteristics such as fertility and hatchability and also in egg weight. Again, mortality was lesser in *Desi* ducks. Taking advantages of these superiority of *Desi* ducks, a selection and breeding program can be initiated to improve those characte-

ristics for which these ducks are inferior.

On the other hand, pure breed and crossbreeding reduced the age at sexual maturity with heavier weight and also produced significantly higher eggs than those of *Desi* ducks. Such improvement of pure and crossbred Khaki Campbell ducks over *Desi* ones may be attributed to the inherent potentiality and heterotic effect respectively. It is, therefore, suggested that crossbreeding program should also be conducted along with the selection and breeding program for the improvement of *Desi* ducks.

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