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Article

Comparative study on growth of different mutants Japanese quail in Bangladesh

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Abstract: This study was conducted to find out the comparative growth performance of six color mutants Japanese quail in Bangladesh. Under this experiment the mortality had shown no significant differences among different isolated plumage color mutants ($p>0.05$). At day- old it is clear that day- old weight was superior in BB- Black than other mutants ($p<0.05$). At 1st week the body weight was higher in BB- Black, intermediate in BB-Dhakaya and BB- Tuxedo and the lowest in BB- White, BB- Fawn and BB- Rosseta ($p<0.05$). At 2nd and 5th weeks of age no significant differences in body weight was found among 6 different isolated plumage color mutants ($p>0.05$). At 3rd week the body weight is higher in BB- Rosseta, intermediate in BB- White, BB- Fawn, BB- Dhakaya and BB- Black and the lowest in BB- Tuxedo ($p<0.05$). At 4th week the body weight was higher in BB- Black and BB- Fawn, intermediate in BB- Rosseta, BB- White and BB- Dhakaya and the lowest in BB- Tuxedo ($p<0.05$). The body weight at marketing age (6 weeks) was higher in BB- Black than other mutants whereas other mutants had shown lower values except BB- Fawn ($p<0.05$). So BB-Black mutants quail is the best one for farming of quail in perspective of growth in Bangladesh.

Keywords: Japanese quail; mutant; growth

1. Introduction

Quail is the smallest and latest domesticated poultry species. Japanese quails are natural inhabitant of Japan. Quails are reared in Japan from the time immemorial. The scientific name of Japanese quail is *Coturnix japonica* under the class Aves and family Phasianidae. There are 17 to 18 varieties of quail in the world, of which Japanese, Bobwhite, King and Stable quail are most important. Japanese quail, a recently introduced economic avian species is ideally suited for meat and egg under intensive management due to their early sexual maturity, higher exponential growth, and higher heat tolerance, fitness for higher density rearing, higher disease resistance and higher egg production than that of other poultry species. Short generation interval and quick business return and the requirement of low investment attracting people to rear them. It appears that quail rearing may be an important to chicken when chicken survived in hostile climates and also for havoc like avian influenza and salmonelloses. The popularity of quail husbandry is increasing all over the world. In Bangladesh quail farming was started more than 2 decade ago. Growth is a trait of prime interest to poultry industry and Japanese quail is considered as a pilot for poultry breeding studies because it is the smallest avian species farmed for meat and egg production (Panda and Singh, 1990). It has also assumed worldwide importance as a laboratory animal (Baumgartner, 1990). In Bangladesh, quail was introduced in 1980s by some interested people solely as a part of hobby. Quail is now being considered as an industrial poultry in Bangladesh because of its unique characteristics. Huque *et al.* (1992) viewed the great scope to popularize quail in this country for

augmentation of Animal protein supply more economically. The faster growth rate, requirement of small amount of feed (20-25g/quail/day), low mortality, less worries for vaccination (high disease resistance), low investment for farming and low space requirement are made encouraging economic traits for quail production. The present study was undertaken to know the growth pattern of different mutants quail for providing the valuable protein as well as quail meat supply to the consumers.

2. Materials and Methods

The experiment was conducted at Bangladesh Agricultural University (BAU) Poultry Farm using the 6 new color mutants of Japanese quail isolated at BAU Poultry Farm (Rahman, 2010). The newly developed color mutants were BB- White, BB- Fawn, BB- Dhakaya, BB- Rosseta, BB- Black and BB- Tuxedo The experiment was completed under comparison of growth and mortality during growing period. Under this experiment total 132 quails cages with 99 females and 33 males of 0 to 6 weeks of age 6 different color mutants were reared for a period of 45 days.

2.1. Experimental design

A total of 132 quails belonging to feather color mutants were divided into 6 treatment of 18 replicates; BB- White (3), BB- Fawn (3), BB- Dhakaya (3), BB- Rosseta (3), BB- Black (3) and BB- Tuxedo (3). Each replicate were consisted of 1 male and 3 female. The replicates were randomly distributed to 18 cage units which provided 7.62 cm^2 cage floor spaces for each quail. The birds of each color replicates were supplied with 25gm/quail/day of feed plus ad libitum clean drinking water. The supplied feed was the commercial broiler and layer mash during growing and laying period respectively having the compositions as mentioned in Table 1. To meet up the micronutrient deficiencies the vitamin-mineral premix were added (Rena WS @ 1g/ liter drinking water) in the diet.

After hatching out of the chicks, their growth rate, body weight and survivability were monitored in three separate batches up to 6 weeks of age. The chicks of all mutants were reared on littered floor supplying commercial broiler diet on ad libitum basis until 6 weeks of age.

2.2. Statistical analysis

All data on laying and growing performance, hatching parameters and mortality rates during growing period were analyzed by the statistical package, Genstat. The data were arranged for a completely randomized design (Steel Torrie, 1980) under analysis of variance (ANOVA). Least significant differences (LSD) were calculated and used to find out the significant difference in color mutants for a parameter.

3. Results and Discussion

Results on body weight gain in different age have been shown in Table 2. At day- old it is clear that day- old weight was superior in BB- Black than other mutants ($p<0.05$). At 1^{st} week the body weight was higher in BB- Black, compare to BB-Dhakaya, BB- Tuxedo, BB- White, BB- Fawn and BB- Rosseta ($p<0.05$). At 2^{nd} and 5^{th} weeks of age no significant difference in body weight was found among 6 different isolated plumage color mutants ($p>0.05$). At 3^{rd} week the body weight was higher in BB- Rosseta than other BB- White, BB- Fawn, BB- Dhakaya, BB- Black and BB- Tuxedo ($p<0.05$). At 4^{th} week the body weight was higher in BB- Black and BB- Fawn compared BB- Rosseta, BB- White, BB- Dhakaya and BB- Tuxedo ($p<0.05$). The body weight at marketing age (6 weeks) was higher in BB- Black than other mutants whereas other mutants had shown lower values except BB- Fawn ($p<0.05$). The mortality rate during growing had shown no difference among different plumage color mutants ($p>0.05$). Body weight found to be different among the colored mutants which is supported by Aboul-Hassan (2001a) and Rahman *et al.* (2010). Besides Such result partially supported by Marks (1971) and Sefton and Siegel (1974). The mortality during growing had shown no significant differences among different isolated plumage color mutants ($p>0.05$) which is shown in Table 3. Such result partially supported by Rahman *et al.* (2010) who reported that the mortality during laying period is not influenced by color, sex or their interactions. Analysis of all the result revealed that the newly developed color mutants; BB- White, BB- Fawn, BB- Dhakaya, BB- Rosseta, BB- Black and BB- Tuxedo were remarkably different for majority of the parameters measured. But, none was singly superior or inferior for all of these characters measured. However, it is shown that the BB- Black was superior for better growth than other mutants.

Table 1. Composition of supplied feed.

Name of the Component	Composition	
	Grower diet (Day-old to 6 week)	Layer mash (6 week onward)
Metabolize energy (Kcal/kg)	2900	2900
Crude Protein (%)	22	20
Crude Fat (%)	4.5	5
Calcium (%)	2	3
Available Phodphorus (%)	1	1.5
Moisture (%)	11	11

Table 2. Body weight gain (g) in different color mutants of Japanese quail during growing period (day-old to 6 weeks).

Age (week)	Color mutants of Japanese quail						Level of Significance
	BB- White	BB- Fawn	BB- Dhakaya	BB- Rosseta	BB- Black	BB- Tuxedo	
Day-old	6.09^{BC}	6.27^{AB}	5.62^{D}	5.85^{DC}	6.44^{A}	5.18^{E}	*
1	17.85^{B}	18.19^{B}	20.90^{AB}	19.03^{B}	23.06^{A}	20.27^{AB}	*
2	31.67	37.13	34.88	38.38	38.74	33.57	NS
3	52.50^{AB}	55.58^{AB}	54.64^{AB}	58.95^{A}	57.37^{AB}	50.43^{B}	*
4	73.67^{AB}	81.59^{A}	76.08^{AB}	78.92^{AB}	81.47^{A}	70.93^{B}	*
5	100.79	109.53	107.35	107.33	112.83	102.74	NS
6	118.52^{B}	123.97^{AB}	123.26^{B}	122.79^{B}	133.77^{A}	118.76^{B}	*

NS, $p>0.05$; *, $p<0.05$
NS= Non-significant

Table 3. Mortality in different color mutants of Japanese quail.

Parameter		Color mutants of Japanese quail						Level of Significance
		BB- White	BB- Fawn	BB- Dhakaya	BB- Rosseta	BB- Black	BB- Tuxedo	
Mortality (%) during laying	M	16.67	11.11	33.33	0.00	0.00	0.00	NS
	F	11.11	7.41	16.67	16.67	33.33	16.67	NS
Mortality (%) during growing	Both M & F	14.90	13.88	12.04	10.01	25.21	16.66	NS

NS, $p>0.05$
NS= Non-significant

4. Conclusions

An experiment was conducted with six mutants; BB-Dhakaya, BB- White, BB- Fawn, BB- Tuxedo, BB-Rosseta, and BB- Black aged 6 weeks having 18 replications to compare the growth performance of 6 color mutants of Japanese quail isolated at BAU for their growth. Under the experiment, the weekly body weight gain and mortality during growing were compared. The mortality had shown no significant differences among different isolated plumage color mutants ($p>0.05$). The body weight at marketing age (6 weeks) was higher in BB- Black than other mutants whereas other mutants had shown lower values except BB- Fawn ($p<0.05$). The result suggested that the newly isolated color mutants of Japanese quail were dissimilar for majority of the growth measured, but further trial is needed for testing their adaptability at farmers' condition before disseminating them among the rural beneficiaries.

Conflict of interest

None to declare.

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