



SHORT COMMUNICATION

Association between Plumage Colour and Body Weight in Native Chickens

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ABSTRACT

A study was conducted using 800-day old native chickens were procured from Veterinary College Hebbal. The chickens body weight was weighed, wing banded and reared under same environmental condition under deep litter system. The vaccination was performed against Newcastle Disease (ND) on 7th day and Infectious Bursal Disease (IBD) on 14th day and booster on 21st and 28th day, respectively. The two hundred (200) each chick of White, Brown, Black and Mixed Plumage pattern of native chicks were selected for the study. The average day-old body weight was 31.10 ± 1.10 , 30.20 ± 1.32 , 31.08 ± 0.89 and 28.70 ± 1.40 gm white, brown, black and mixed plumage pattern, respectively. The body weight was recorded in 2nd, 4th and 6th week of age showed an average body weight of 106.44 ± 11.97 , 111.68 ± 11.53 , 118.36 ± 9.08 and 108.68 ± 11.53 gm in 2nd week, 204.60 ± 27.60 , 212.40 ± 27.07 , 225.90 ± 21.00 and 202.12 ± 18.40 gm in fourth week and 361.80 ± 56.00 , 382.50 ± 54.00 , 407.12 ± 35.76 and 366.48 ± 54.36 gm in sixth week of age for white, brown, black and mixed plumage pattern respectively. The highest body weight was observed in black plumage-coloured birds followed by brown plumage and there was no significant difference between white and mixed coloured plumage birds. This study revealed that the darker coloured plumage chickens could be selected for future breeding programme at an early age and also increase the body weight of the birds.

HIGHLIGHTS

- Plumage colour and body weight plays a significant role for selection of birds at an early age.
- Selection of birds at an early age improves the socio-economic status of the poor farmers.

Keywords: Desi Chicken, Plumage colour, Body weight, Early selection

In India, poultry production has developed as one of the fast-budding sectors among various livestock sectors from its transformation from traditional backyard system to organized commercial farming over the last few decades. This sector includes low, medium and high input/ output systems of rearing and is providing employment to over 7 million people, apart from household income and nutritional security to numerous small poultry keepers in rural and tribal areas of the country. It contributes about 0.5% to the national GDP (Gross domestic product) and about 10% to the livestock GDP in our country. Technological support is, therefore, crucial for the sustainable growth of the poultry sector. In poultry, desi

chickens play very crucial role in rural economy people and also it improves the socio-economic status of the poor and landless farmers.

The domestic fowls (*Gallus gallus domesticus*) were abundantly available in Karnataka state. These birds are mainly suitable for backyard farming system. The plumage colour pattern plays an important role of keeping the local birds not only for egg and meat production

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**Table 1:** Different age group of White, Brown, Black and Mixed Plumage of native birds and their body weight

Sl. No	Plumage colour	Day old	2 nd week	4 th week	6 th week
1	White	31.10 ± 1.10	106.44 ± 11.97	204.60 ± 27.60	361.80 ± 56.00
2	Brown	30.20 ± 1.32	111.68 ± 11.53	212.40 ± 27.07	382.00 ± 54.00
3	Black	31.08 ± 0.89	118.36 ± 9.08	225.90 ± 21.00	407.12 ± 35.76
4	Mixed	28.70 ± 1.40	108.68 ± 11.53	202.12 ± 18.40	366.48 ± 54.36

*Body weight are taken in grams.

but also to satisfy their visual appeal and to meet their cultural and religious needs (Dana *et al.*, 2010). In our country, backyard poultry system has supports to poor landless farmer, tribal, and other backward classes people to enhance their livelihoods to climb the poverty ladder as well as asset growth (Islam *et al.*, 2021). The local chicken shows striking morphological variations like plumage colour (Hassaballah, *et al.*, 2014). The plumage colour of poultry has been widely used as a morphological genetic marker for selection of birds at an early age and also considered as an important economic trait that caters to consumer preference (Yang *et al.*, 2019). The genetic variation in local birds helps in selecting the birds (Benitez, 2002). Hence, the present work was carried out to find the association between the body weight of birds with different plumage (white, brown, black and mixed plumage) colour.

The study was performed at livestock farm complex of veterinary college, Hassan. Hassan district of Karnataka state is lying between 12° 13' and 13° 33' north latitudes and 75° 33' and 76° 38' east longitude, Hassan district has a total area of 6826.15 km². The geography is mixed with mountain region to the west and south west called Bisle Ghat and plains regions in north, south and east.

The present study was does not involved any intervention of sample collection or the tissues from the birds.

The study comprises of eight hundred (800) desi day-old chicks were procured from the veterinary college, Hebbal, Bengaluru. All these birds were wing banded and weighted at day old of hatching. Nearly, two hundred (200) desi day-old birds were grouped into 4 groups based upon their day-old plumage colour as white, brown, black and mixed. The body weight was recorded (in gm) on day old birds followed by 2nd, 4th and 6th week of age using kitchen weighing balance.

The statistical data package for social science (SPSS, Version 17) was used to analyse the data at 5% level of significance.

The average body weight of white plumage birds (around 200) of 31.10 ± 1.10, 106.44 ± 11.97, 204.60 ± 27.60 and 361.80 ± 56.00, at day old, 2nd week, 4th week and 6th week, respectively. The average body weight of Brown at day old, 2nd, 4th and 6th week of age was 30.2 ± 1.32, 111.68 ± 11.53, 212.40 ± 27.07, and 382.50 ± 54.00, respectively. Similarly, the average body weight of Black and mixed plumage at day old, 2nd, 4th, and 6th week age were 31.08 ± 0.89, 118.36 ± 9.80, 225.90 ± 21.00 and 407.12 ± 35.76 for black and 281.70±1.40, 108.68 ± 11.53, 202.12 ± 18.40, and 366.48 ± 54.36 for mixed type, respectively. The highest body weight was observed in black plumage colour followed by brown plumage and there was no significant difference between white and mixed coloured plumage birds.

Abbass *et al.* (2017) reported that the effect of plumage colour and body weight of the semen quality in naked neck chicken. The Black colour plumage birds contributed significantly more semen volume (0.21 ± 0.02 ml) and sperm concentration (1.88 ± 0.06 × 10 ml) as compared to light weight (light = < 1600 gm) group and also, he reported that black plumage colour could be used to increases the fertility rate in naked neck chicken. Similarly, Rizzi (2017) access the growth performance and carcass quality in Padovana chicken breed based on the plumage colour pattern. The study consists of two variety of plumage colour like chamosis and silver. It was concluded that chamosis plumage chicken had higher carcass weight than silver plumage colour chicken. The silver plumage chickens reported to be higher incidence on body weight of head and neck, and feet. Nie *et al.* (2019) indicated that white plumage chickens had significantly

higher aggressiveness as comparison to the red plumage in chasing, attacking, pecking, and threatening behaviour traits. The few literatures are available regarding association between plumage colour and body weights in native birds. Different age group of White, Brown, Black and Mixed Plumage of native birds and their body weight are mentioned in Table 1.

CONCLUSION

The study predicts that the darker coloured plumage can be selected at early age for future purposes to increase the body weight. There by helping the farmers for early selection of birds and improving their socio-economic status. However, as a complex trait, plumage colour is determined by complex pathway system and multiple interactive patterns; further studies would be helpful to confirm this conclusion.

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