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Study of morphometric traits in farmbred geese population

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Abstract

The present investigation was focused to document the morphological traits of farmbred geese population in Tamil Nadu. Body measurements on beak length, beak width, neck length, trunk length, body length, chest width, chest circumference, wing length, tibial length, tibial circumference, metatarsal length, metatarsal circumference and live body weight were recorded on a farmbred geese population maintained at Sheep Breeding Research Station, Sandynallah, The Nilgiris. The mean live body weight (pooled gender) of less than one month, 1-4 month and more than one year age were 0.56 ± 0.27 kg, 2.53 ± 0.36 kg and 3.08 ± 0.30 kg, respectively. The consistent correlation of body length, neck length, chest width and chest circumference with live body weight in both grower and adult stage were observed. The geese variety in Tamil Nadu was studied for its morphometric traits for the first time to generate the basic data that can be used for further characterization of the population which was very much needed.

Keywords: Geese, Morphometric traits, Tamil Nadu, Farmbred

Introduction

Domestic geese (*Anser anser domesticus*) are known for its high growth rate, free range grazing, disease resistance (NRC, 1991) ^[9] and high quality meat (Romanov, 1999) ^[10]. Since, geese are grass foragers and weeders it is suitable for farming in wetlands. Geese farming will give additional income besides its protein rich meat. The practice of geese farming in India, particularly in Tamil Nadu is very much limited even in available wetland areas. The reasons may be due to lack of awareness about geese varieties, feeding, breeding and marketing. Hence, scientific literatures on geese husbandry, research and development in India and in Tamil Nadu are scanty. The available literatures are on the status, growth and production of domestic geese in Kashmir valley (Hamadini, H. *et al.*, 2013, 2014a, 2014b, 2020) ^{[2], [3], [4], [5]}; characterization and performance evaluation of indigenous geese in Assam (Hoque, H. *et al.*, 2023) ^[7]; growth and hatch performance of geese in hilly terrain of Nilgiris (Kumar, A. *et al.*, 2015) ^[8]; In India, the only recognized and registered geese breed is Kashmir Anz (Verma, *et al.* 2017) ^[13]. Characterization of any new population and its recognition requires extensive data on various aspects *viz.* morphology and molecular levels. The present investigation was focused to document the morphological traits of farmbred geese population in Tamil Nadu.

Materials and Methods

Body measurements on beak length (BKL), beak width (BKW), neck length (NL), trunk length (TRL), body length (BL), chest width (CW), chest circumference (CC), wing length (WL), tibial length (TL), tibial circumference (TC), metatarsal length (MTL), metatarsal circumference (MTC) and live body weight (LBW) were recorded on both sexes of 90 geese maintained at Sheep Breeding Research Station (SBRS), Sandynallah, The Nilgiris. The points of measurements were taken as per Szabone Willin (1997) ^[12]. Recorded data were subjected for appropriate statistical analysis (Harvey, W.R., 1990) ^[6].

Results and Discussion

Live body weight and morphometric traits

The mean live body weight (pooled gender) of less than one month, 1-4 month and more than one year age were 0.56 ± 0.27 kg, 2.53 ± 0.36 kg and 3.08 ± 0.30 kg, respectively. Kumar, A. *et*

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al., (2015) [8] reported the body weight of one month and four month age as 0.61 ± 11.30 kg and 2.68 ± 0.04 kg, respectively. The differences observed were may be due to the year, season effect. Also, the differences in body weight of similar age groups between these two studies were not remarkable but

comparable. All twelve morphological parameters were first time documented in the geese from Tamil Nadu (Table 1). It forms the basic morphometric data useful for further characterization of the geese population in Tamil Nadu.

Table 1: The mean value of different body measurements observed in different age groups.

Age	<1 month	1-4 month		>1 year (Male)	
Gender	Pooled (11)	Male (6)	Female (9)	Male (28)	Female (36)
LBW (in kg)	0.56 ± 0.27	2.53 ± 0.41	2.53 ± 0.32	3.32 ± 0.31	2.84 ± 0.29
BKL (in cm)	3.93 ± 0.80	8.03 ± 0.66	7.79 ± 0.68	10.68 ± 0.66	8.65 ± 0.67
BKW (in cm)	2.10 ± 0.54	3.30 ± 0.20	3.30 ± 0.20	3.53 ± 0.19	3.19 ± 0.18
NL (in cm)	11.90 ± 2.36	23.60 ± 1.02	22.80 ± 1.09	33.37 ± 2.01	28.22 ± 1.74
TRL (in cm)	16.36 ± 3.52	27.40 ± 1.20	26.20 ± 1.99	26.51 ± 1.90	24.70 ± 2.18
BL (in cm)	28.27 ± 5.62	51.00 ± 1.79	49.00 ± 2.65	59.89 ± 2.88	52.93 ± 2.85
CC (in cm)	17.90 ± 2.25	34.80 ± 1.60	35.10 ± 2.67	41.33 ± 2.34	38.75 ± 1.89
CW (in cm)	7.04 ± 1.36	11.40 ± 1.28	11.70 ± 0.83	13.57 ± 1.02	12.70 ± 1.39
WL (in cm)	10.54 ± 3.40	22.90 ± 0.80	22.90 ± 2.20	25.62 ± 1.63	24.55 ± 1.36
TL (in cm)	9.45 ± 1.90	13.30 ± 0.42	13.20 ± 0.83	15.42 ± 0.86	13.76 ± 0.84
TC (in cm)	5.22 ± 0.68	7.90 ± 0.70	6.80 ± 0.40	6.78 ± 0.56	6.60 ± 0.52
MTL (in cm)	4.04 ± 0.41	5.00 ± 0.00	4.94 ± 0.17	5.46 ± 0.48	5.11 ± 0.29
MTC (in cm)	5.04 ± 1.12	7.17 ± 0.41	6.94 ± 0.58	7.67 ± 0.56	7.04 ± 0.57

Phenotypic correlations

Live body weight of a goose is determined by size and density of organs at a given age (Brody, 1945 and Saatci, M., *et al.* 2007) [1], [11]. At the age of less than one month, BKL, CC and BL had significant correlation of 0.884, 0.747 and 0.693 with LBW respectively. It may be due to juvenile stage of development of neck, wing, leg, chest and internal organs. Hence, LBW of gosling is primarily determined by hardy beak along with BL. As the bird grows all body parts including neck, wing, leg, chest, internal organs also increase both in size and density. This upward trend continues till bird reaches adult stage of around one year. Present study supported this by revealing significant correlation between almost all body measurements and LBW. Indeed, CW, NL, WL and BL showed correlation of 0.985, 0.974, 0.971 and 0.959 with LBW respectively during 1-4 month of age. Expectedly, CC, BL and NL showed high correlation of 0.864, 0.771 and 0.701 with LBW in adult birds. The consistent relationship of BL, NL, CW and CC with LBW in both grower and adult stage is noteworthy.

Conclusion

The geese variety in Tamil Nadu was studied for its morphometric traits for the first time to generate the basic data that can be used for further characterization of the population which was very much needed. The body weights of the geese at different ages were showed high correlations with BL, NL, CW and CC.

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