Phenotypic characterization of Tswana chickens based on quantitative traits in Kweneng and Southern Districts, Botswana

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Abstract

The objective of this study was to characterize both sexes of the naked-neck, dwarf, rumpless, normal-feathered and frizzled strains of Tswana chickens in the Kweneng and Southern districts of Botswana using some quantitative traits. A total of eight (8) quantitative morphological traits such as shank length, shank circumference, spur length, comb length, wattle length, wing length and wingspan were measured using flexible measuring tape, and live body weight was measured using a Spring-Dial Hoist weighing scale.

Data were analyzed using mixed models procedures of SAS and the model included fixed effects of strain and sex and their interaction. Normal-feathered males had significantly higher shank length (9.94±0.23 versus 8.35±0.20), shank circumference (0.99±0.02 versus 0.84±0.02) wing length (20.61±0.51 versus 18.60±0.48), wingspan (41.22±1.03 versus 37.19±0.96), comb length (6.30±0.30 versus 3.48±0.26) and wattle length (3.44±0.16 versus 2.40±0.14) than their female counterparts. Normal-feathered males had the highest live weight and rumpless males had the lowest live weight.

Normal-feathered, naked- neck, frizzled and rumpless females had similar shank length and shank circumference which were all significantly higher than those of their dwarf counterparts. Only naked-neck and normal-feathered females had significantly higher wingspan and wing length than dwarf females. Finally it was noted from this study that various strains of Tswana chickens had the same quantitative traits except for shank length and shank circumference which were significantly smaller in dwarf strain compared to the other four strains. This research work will also play an important role by provision of current information on quantitative traits of Tswana chicken strains.

Key words: *morphological measurements, quantitative traits, Tswana chickens*

Introduction

In Botswana, indigenous chickens are referred to as Tswana chickens. They are classified into five strains: dwarf, rumpless, frizzled, naked-neck and normal with the most common strain being the normal (Badubi *et al.*, 2006). The terms backyard, local, traditional, village, scavenging or family chickens are used synonymously to refer to indigenous chickens. Tswana chickens are usually produced under the extensive farming systems where the birds mostly scavenge for feeds, picking food items such as food scraps and insects around the households with little or no supplementation and uncontrolled breeding (Aganga *et al.*, 2000; Moreki, 2000; Badubi *et al.*, 2006). Indigenous chickens are subjected to challenging selection pressure due to the unsuitable management conditions under which they are reared and represent an important reservoir of genetic variation that is supposed to be conserved (Guèye, 1998). Indigenous chickens are underestimated because of their poor performance under traditional free running system (Getu *et al.*, 2014). Most village farmers however prefer family chickens as they can survive better in local environment with available limited feed resources (Cabarles, 2013). These types of birds need minimal management to produce eggs and meat basically for household consumption and local markets (Magpantay *et al.*, 2006).

Indigenous chickens can be recognized as gene reservoir, especially for those genes that have adaptive values in the tropical conditions (Aklilu *et al.*, 2013). In Botswana, family chickens are the most widespread animals where