



## Phenotypic Characterisation of Local Chicken Ecotypes Indigenous to Semi-arid Areas of Central Tanzania

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### Abstract

Optimal productivity of local chicken population is limited by poor genetic material and lack of appropriate breeding strategy, poor housing management, poor feeding and nutrition, and incidences of diseases. A study was carried out in Kongwa and Kiteto districts of central Tanzania to characterize local chicken ecotypes with high meat production potential based on objectives: (1) to assess qualitative traits, and (2) to quantify phenotypic characteristics of selected local chicken ecotypes. Chickens indigenous to selected sites of the two districts were screened for qualitative traits mainly plumage colour, comb type, shank colour, and physical parameters, namely, body weight, chest circumference and shank length. Data on chicken qualitative traits were analysed for simple descriptive statistics using SPSS. Data on quantitative traits were analysed into means and standard errors using analysis of variance (ANOVA) of SAS. Results revealed variable plumage colour ranging from white, brown, white as well as comb type. The chickens exhibited highly variable body weight (BWT), body length (BL), chest circumference (CC) and shank length (SL) attributes suggesting high variability in economic traits both between and within ecotypes. Phenotypic measurements show notable variations in live BWT, BL, CC and SL between ecotypes ( $P<0.001$ ), study villages ( $P<0.001$ ) and due to the interaction effects of ecotypes and study villages ( $P<0.001$ ). Mean BWT ranged from 1.1 to 2.8 kg (mean; 1.8 kg). The BL, CC and SL varied from 32.2 to 44.5 cm, 26.3 to 35.5 cm and 7.5 to 9.8 cm, respectively. Body measurements were positively correlated with body weight. There were clear variation in terms of phenotypic performance between sexes with cocks having higher measurements than hens and pullets. Local strains with promising characters include chickens with less feathered bodies locally known as 'Kuchi' strain. Kuchi strain is characterised by higher body weight than other local strains. Chickens with naked neck- gene suggest both high meat and egg production potential. Chickens with frizzled feathers locally known as 'Sasamala' were appearing at low frequency in the village rural chicken population probably suggesting being of less stable gene. The SL was positively correlated with BWT ( $r= 0.55$ ). The SL was positively correlated with BWT ( $r=0.43$ ). Similarly, SL was positively correlated with BWT ( $r=0.31$ ). Cross-bred chickens represent a strain with promising high production potential in terms of carcass weight. This potential could be further improved through controlled cross breeding. It is further recommended to carry out a genetic analysis to isolate the concerned quantitative traits.

**Keywords:** Plumage color, body weight, domesticated chickens, Central Tanzania, local chicken ecotypes

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