Estimation of Heritability and Genetic Correlation of Quantitative Traits as a Basis for Selection Program of Indonesian Native Chickens

Suyatno Suyatno[1], *Sujono* Sujono[2], *Aris* Winaya[2,*], *Lili* Zalizar[2], and *Ravindran* Jaganathan[3]

[1]University of Muhammadiyah Malang, Jl. Raya Tlogomas No 246, Malang 65144, East Java, Indonesia
[2]Department of Animal Science, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Malang 65144, East Java, Indonesia
[3]Department of Preclinical, Microbiology Unit, Faculty of Medicine, Royal College of Medicine, Universiti Kuala Lumpur, Jl. Greentown No. 3, 30450 Ipoh, Perak, Malaysia

Abstract. Native chicken is a potential genetic source to produce new superior and productive strains. The genetic parameter information is needed as basis data for the selection program to improve the genetic quality of native chickens. This study aimed to estimate the heritability and genetic correlation of quantitative traits in local Indonesian chickens. The material used is the offspring from outbreeding, crossbreeding, and reciprocal crosses of four native chicken lines: White, Lurik, Wareng, and Ranupane. The traits observed were Body Weight (BW), Body Height (BH), Body Length (BL), Body Circumference (BC), Wing Length (WL), Beak Length (BeL), Head Circumference (HC), Thigh-Shank Length (TSL), and Thigh Circumference (TC). The ANOVA and ANCOVA were used to estimate heritability and genetic correlation based on the mating lines of each cage/pen. The mating line significantly affected all the measured traits ($P < 0.05$). The highest heritability was obtained for BW ($h^2 = 0.25$, moderate category). A positive genetic correlation was found between BW and all other traits except for BeL and HC. In conclusion, body weight can be considered for early selection because it has the highest heritability and positive genetic correlation with other traits related to body size.

Keywords: Body measurement, *Gallus domesticus* (Linnaeus, 1758), genetic parameter, mating lines.

* Corresponding author: winaya@umm.ac.id