ABSTRACT

Innate immunity plays significant role in combating disease. Improvement of any trait including resistance to disease and infection requires identification of genetic and nongenetic sources of variation. This study aimed at deciphering the factors (both genetic and non-genetic) that confers variation in natural antibodies titres values in indigenous chicken of Kenya. The study was conducted at the Smallholder Indigenous Chicken Improvement Program Research Unit at Egerton University, Kenya. The meta data involving several factors (genotypes, ecotypes, cluster, sex, plate and breed) were analysed. The natural antibodies titre values were measured by indirect enzyme linked immunosorbent assay. Two sample t test for means and variance were compared for breed (RIR and IC) and sex (male and female) using IgG, IgA and IgM natural antibody isotypes titre values as dependant variables. One factor linear model was used to determine source of variation. A mixed model fitting chicken as random variable was used as the final model. For the two sample T test, there was significant difference on means for breed and sex ($p=0.05$) for all immunoglobulins isotypes. The T test showed significant difference in variance of breed ($p=0.05$) but not sex. However, the indigenous chicken and male chicken had higher variance estimates. Breed effect was significant for IgA ($P=0.0323$) but not IgG and IgM. Sex was significant for IgG ($P=0.0279$) but insignificant for IgA and IgM. Genotype and ecotype were insignificant while plate was significant respectively for both isotypes. Cluster was significant for IgA but not IgM and IgG. The variance estimate for chicken components were high and significant for IgM ($p=0.003$), IgG ($p=0.0001$) and IgA ($p=0.0001$). The residual variance estimates were small and insignificant for all the isotypes. The results implied the male had higher NAbs titres values for all isotypes and could be used in selection of male line. The big variance estimate within the IC imply genetic improvement in NAbs against plethora of pathogens could be achieved through selection and crossbreeding.

Keywords: indigenous chicken, determinants, natural antibodies, variation