

## **Abstract**

The immune system is a mechanism that protects the body against Pathogenic factors. As a weakened immune system increases due to the losses and damages, it's improvement may have a negative effect on growth performance. Therefore, having sufficient information regarding the genetic parameters such as heritability and genetic correlations related to the immune system and growth traits in Japanese quail to provide successful breeding program, in order to promote health and quality of eggs and quail meat seems necessary. Therefore the present study, evaluates genetic structure in two successive generations of Japanese quails in Poultry Research Center, Faculty of Agriculture, University of Zabol. Therefore, genetic parameters related to body weight and ADG traits during two generations for 1533 and 446 quails, respectively, the traits related to the immune system response against SRBC and Newcastle virus vaccine for 591 and 541 quails, and genetic parameters related to the activities of plasma and egg white lysozymes for 560 and 319 quails, respectively, were registering and estimated through BLUP F90 software. All of the genetic parameters were estimated using bivariate animal model. The highest and lowest heritability estimates for growth traits among 15 weight and 14 ADG traits were 0.44 and 0.11 which were related to 10 and 35 days and the heritability of ADG50-55 and ADG25-30 were estimated to be 0.46 and 0.01, respectively. Heritability estimates of humoral immune system such as total antibody titer, IgY, IgM, and Ab.NDV were 0.25, 0.23, 0.04 and 0.02, respectively, and heritability estimates and innate immune of plasma and egg white lysozyme activity were 0.21 and 0.04, respectively. In this study, the genetic correlations among growth traits were positive and high, ranged between 0.420 to 0.999, and among ADG traits were ranged between  $-0.999$  to 0.999. There was a genetically positive correlation (0.118 to 0.995) among humoral traits including Ab.NDV, IgY, IgM and there was a negative correlation ( $-0.457$ ) between total antibody titer and Ab.NDV. Likewise, there was a negative correlation ( $-0.078$  to  $-0.945$ ), between humoral immune traits and plasma Lysozyme activity. Also, there were negative correlation between egg lysozyme and humoral immune including antibody titer and Ab.NDV ( $-0.099$  and  $-0.509$  respectively) and they were positively correlated with IgM and IgY (0.741-0.418). Furthermore, there was a negative correlation between immune traits with weight and ADG over the study which was located among 0.995 to  $-0.983$  and 0.999 to  $-0.999$ , respectively.

**Keywords:** Antibody titer, ADG, SRBC, Genetic correlation, Body weight



University of Zabol  
Graduate school  
Faculty of Agriculture  
Department of Animal Science  
The Thesis Submitted for M.Sc. Degree of Animal Breeding and  
Genetics

**Estimation of genetic parameters of growth, humoral and  
innate immunity traits in Japanese quail**

**Supervisor**

Dr. Ali Maghsoudi  
Dr. Farzad Bagherzadeh Kasmani

**Advisers**

Dr. Mohammad Rokouei  
Dr. Hadi Faraji Arough

**By**

Ayoub Mohammadi

January 2017