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Graduate school
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**The Thesis Submitted for M.Sc. Degree of Animal
Breeding and Genetics**

**Study of genetic relationship
between plasma lysozyme activity
with growth traits in quail**

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Abstract

Improving the genetic status of the immune system of birds with high production potential can be the goal of poultry breeding programs. Lysozyme activity is one of the nonspecific safety parameters that has antibacterial activity. Improving this trait by using correlated traits requires knowledge of its genetic correlation with important economic traits including growth traits. For this purpose, the present study aimed to investigate the plasma lysozyme activity using growth models and to study the relationship between model parameters and growth traits on the population. Japanese quail bred at the Livestock Research Institute Zabul University was held. Data on cumulative activity of plasma lysozyme 1985 (1004 females and 360 males) of Japanese quail during two breeding periods in 6 generations was used. 5 growth models were fitted separately on the time data of lysozyme activity and based on the good fit criteria, the most suitable model for males and females was selected. Then, the model parameters suitable for each bird were calculated and the components of variance and heritability of the parameters were estimated using single-trait analysis and the correlation between model parameters and growth traits (daily weight, 25 and 45 days) was analyzed using Multi-trait analysis was calculated. In the present study, the heritability of the appropriate model parameters was estimated in the range of 0.037-0.017, with the lowest heritability related to the initial cumulative activity of lysozyme (w_0) and the highest heritability related to time estimated. The correlation between weight traits and curve variables ranged from -0.769 to 0.494, with the highest negative correlation related to the estimated time (t_i) with 25-day weight and the highest positive correlation related to the turning point (w_i) with Weight was 45 days.

Keywords: Heritability, Innate immunity, Non-linear functions, Quail