Estimation of genetic parameters for partial egg production periods by means of random regression models

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ABSTRACT. We estimated genetic parameters for egg production in different periods by means of random regression models, aiming at selection based on partial egg production from a generation of layers. The production was evaluated for each individual by recording the number of eggs produced from 20 to 70 weeks of age, with partial records taken every three weeks for a total of 17 periods. The covariance functions were estimated with a random regression model by the restricted maximum likelihood method. A model composed of third-order polynomials for the additive effect, ninth-order polynomials for the permanent environment, and a residual variance structure with five distinct classes, was found to be most suitable for adjusting the egg production data for laying hens. The heritability estimates varied from 0.04 to 0.14. The genetic correlations were all positive, varying from 0.10 to 0.99. Selection applied in partial egg production periods will result in greater genetic profit for the adjacent

periods. However, as the distance in time between periods increases, selection becomes less efficient. Selection based on the second period (23 to 25 weeks of age), where greater heritability was estimated, would note benefit the final egg-laying cycle periods.

Key words: Longitudinal data; Poultry; Random regression