

Modelling of growth alteration in Japanese quail after a selection experiment for body weight at 4 weeks of age.

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ABSTRACT

The current study investigated the influence of selection for body weight (BW) on growth curve parameters in two lines of Japanese quail through a mixed model approach. Live BWs of 1400 Japanese quail were recorded at 3-day intervals from hatching to 42 days of age. Birds were distributed equally across lines (selected and control) and sexes (male and female). The asymptotic weight parameter (β_0) values were always higher in Gompertz than Richards models in both lines. The values of β_0 were higher in the selected than control lines and in females than males across models. Differences were found in the inflection point for age and weight across lines and sexes. Values of the growth rate parameter (β_2) ranged from 0.06 to 0.10 in both models, favoring males over females in both lines. Lower weights at the inflection point of both models were observed in the control line. Determination coefficient (R^2) of both models in different genetic groups and sexes was similar. Mean square error (MSE) values of the Gompertz model were lower for females in selected v. control lines. In contrast, MSE values of the Richards model were lower for selected males v. control males. According to the criteria of choice (highest R^2 and lowest MSE, Akaike information criterion and Bayesian information criterion), the Richards model was considered the best fitting model for the growth data of males, while the Gompertz model was the best for growth data of female quails in both lines.

Key words: Gompertz, growth curves, Japanese quail, mixed model and Richards