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The laying hen industry aims to extend the laying production career to 90 weeks or more to increase profitability and promote ethical and environmental benefits. However, this can be challenging due to declining egg production and quality as well as reduced efficiency in aging hens. To investigate persistency in egg production, quality, and feed efficiency, we studied 1024 purebred hens from the nucleus of Novogen between 70 and 90 wk of age.
We recorded daily egg production throughout the period and measured individual feed intake twice a week for three weeks, starting at 70, 80, and 90 wks of age, as well as body weight at the start and at the end of each feed intake recording period. Egg quality was assessed at 70 and 90 wk
Random regressions models were used to study trait variation on a trajectory of time and genotype by time interactions. Among the measured traits, egg weight, feed conversion ratio, weight gain, and Haugh unit showed persistency over the measured period. Daily feed intake, egg mass, residual feed intake, and laying rate decreased over time, while body weight and yolk percentage increased during the late period of production.To assess the viability and ways of selecting for trait persistency (*i.e.* stability over time), we estimated the genetic variance of the slope and its correlation with the intercept. We found that for laying rate and egg weight, the genetic variance of the slope was negligible, indicating that selection for persistency on these traits requires other means. On the contray, for other traits such as residual feed intake, there is significant additive genetic variance in the slope. In addition, the genetic correlation between the intercept and the slope was -0.19, meaning that already decreasing residual feed intake level would also reduce the negative slope and help improve persistency. This can be further improved by integrating the slope in the selection criteria.

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