Effects of selection for fast growth rate on Japanese quail laying performance and fitness traits

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Egypt. Poult. Sci.(2020) (Accepted). In Press.

ABSTRACT

This work aimed to study the effects of selection for fast growth rate on some laying and fitness performance in Japanese quail using 1157 females (706 for the selected line and 451 for the control line). The most important results obtained as follows:

Generation significantly affected all egg studied traits indicating that the 4th generation (G_4) had the earliest age at first egg (AFE) and age at the first ten eggs (AGE_{10}) accompanied by the heaviest body weight at first egg (BW_{AFE}**)** and desirably had lower days needed to produce the first ten eggs (DN_{10}) and laid heavier average egg weight (AEW_{FM}) (48.98 day, 60.87 day, 260.77 g, 13.12 day and 11.88 g respectively) and had higher number of eggs (EN_{FM}), heavier egg mass for the first month of production (EM_{FM}), and favorably lower pause duration length (PDL_{FM}) than other generations being of 24.53 egg, 291.32 g and 1.76 day, respectively. Moreover, the G_4 had higher fertility (88.20%) and hatchability (85.42%) associated with preferably lower early and late embryonic mortality% than other generations.

The selected line attained AFE at earlier age (50.63 day) with heavier BW_{AFE} (260.59g) and lower DN_{10} (14.06 day) and AGE_{10} (64.44 day), laid more EN_{FM} (22.63egg), higher EM_{FM} (263.67g), earlier age after first month of production (AGE_{FM}, 80.63 day), larger clutch size (CS_{FM}, 5.20) and shorter PDL_{FM} (1.89 day) and had preferably higher fertility (80.69%), hatchability (74.14%) but undesirably higher early embryonic mortality% (2.68%) than the control line.

There were favorable negative correlations between growth rate during 1-21 days of age (GR_{1-21}.) and each of AFE, DN_{10}, AGE_{10}, PDL_{FM} and AGE_{FM} and had preferably positive rg's with each of BW_{AFE}, EN_{FM}, EM_{FM}, clutch number for the first month of production and CS_{FM}, it seemed these traits can be indirectly improved through the selection for fast GR_{1-21}.

Key words: Japanese quail, fast growth rate, egg production, fertility and genetic gain.