

## ABSTRACT

Data of three lines of Japanese quail were used in this study. The first and second lines were selected over three generations for high six weeks-body weight ( $HBW_6$ ) and high 0-6weeks growth rate ( $HGR_{0-6}$ ) respectively, whereas the third randombred control line (RC) was kept without selection in order to facilitate comparison among lines. This study was performed to investigate the effects of :

1. Sex, line and age on hematological, growth and carcass traits.
2. To estimate correlations among the studied trait.
3. To predict the growth and carcass traits of six weeks old quail using data of plasma constituents of three weeks old through stepwise regression .
4. To partition the variability in growth and carcass traits of three lines of Japanese quail differing in genetic background through path analyses.

Chicks at six weeks of age had significantly higher values of live body weight ( $BW_6$ ), carcass%, dressing%, boneless meat% (BLM%), fat%, protein%, red blood cells (RBCs), growth hormone (GH), total proteins (TP), globulin (Glob), triglycerides (TG) and total lipids (TL) than those at three weeks of age. However, birds at three weeks of age had the highest hemoglobin (Hb), white blood cells (WBCs) and albumin (Alb). The  $HGR_{0-6}$  line had higher  $BW_6$ , performance index (PI), carcass%, dressing%, BLM%, TP, Alb , TL, triiodothyronine ( $T_3$ ) and ratio of  $T_3$  to thyroxine ( $T_3/T_4$ ) than other lines.

Females had significantly higher  $BW_6$ , PI, TP, Alb, Glob, TG and TL than males. Although males had significantly higher carcass% and BLM%, their PI was poorer than females. Males had significantly higher GH than females.

Significant line by age interactions were found for  $BW_6$ , carcass%, dressing%, fat% , protein%, Hb, PCV%, RBCs, GH, TP, Alb, Glob,  $T_3$ ,  $T_4$  and  $T_3/T_4$  . In conclusion, selection is considered to have a central role in variations in plasma constituents, hematological parameters and carcass traits which are related to differences in age and sex of Japanese quail.

There were no apparent trend with regard to age nor did there appear to be a systematic difference between unselected and selected lines. There were significant asymmetrical inconsistent correlations either in direction or magnitude ranging between medium to high between males and females for each of the studied lines. Therefore, either certain studied hematological values or plasma constituents at three weeks of age in studied lines of both sexes could be used to predict carcass and growth productive traits in Japanese quail with appropriate precision and low error.

Results of the stepwise regression analyses revealed that either certain studied hematological values or plasma constituents at three weeks of age in studied lines of both sex groups could be used to predict carcass and growth productive traits in Japanese quail with high precision and low error.

The results of path analyses revealed that the studied plasma constituents measured at three weeks of age in both sexes could be used to predict carcass traits and growth productive performance in Japanese quail. Each of GH, TG, TL, Alb, TP and  $T_3/T_4$  was the first contributors of studied productive traits in line by sex groups indicating direct effects which ranged from 0.530 to 0.763, 0.504 to 0.945, 0.887 to 0.906, 0.513 to 0.990 and 0.609 to 0.892, respectively.

Plasma constituents showed higher indirect coefficients of determination for their effects on all studied productive traits than their direct effects. This suggests that a part of the variations in these traits could be attributed to a trait or more, not counted for in this study and may diminish the random error variation when considered.

**Key words: Hematology, plasma constituents, growth, carcass traits, short-term selection, variability, Japanese quail.**