## SUMMARY

This work was carried out on Dokki-4 chickens (as a native breed) raised in the Poultry Research Farm at Inshas (Sharkia Governorate), Animal Production Research Institute, Ministry of Agriculture, Egypt. A total number of 4057 progeny produced by 35 sires in three consecutive hatches were collected in the period from March 1979 to June 1980. Data of individual body weight (BW) at hatch and biweekly thereafter up to 12 weeks of age were analysed. Other growth traits such as daily gain (DG), absolute gain (AG) and relative growth rate (RG) between 0-4, 4-8, 8-12 and 0-12 weeks of age were analysed separately. Mixed Model analyses were performed in order to quantify the average genetic, phenotypic and environmental variation and covariation of such growth traits and to assess the direct and correlated responses expected from selection for these traits. The following results were obtained:

(1) DG and AG of Dokki-4 chickens increased with the advancement of age. RG was higher (137.45%) at the early stages (0-4 weeks), then decreased gradually with the advancement of age at the interval of 8-12 weeks.

(2) Coefficients of variation (CV) for growth traits are tended generally to increase as the chick advanceed in age . The AG and RG during the period of 0-4 weeks were 19.83% and 7.2% compared to 31.12% and 22.88% during the period of 8-12 weeks, respectively.

(3) Highly significant differences ($P<0.05$ or $P<0.01$ or $P<0.001$) due to effects of hatch, sex and hatch x sex interaction for most growth traits were obtained.

(4) The differences due to sires and dams for all growth traits at different ages were highly significant ($P<0.01$ or $P<0.001$). Percentages (V%) of sire, dam within sire and error components of variance are variable for different growth traits. Small proportions of variation (V%) due to sire effects on BW (2.4%) and on both DG and AG (2.7%) were obtained. However, large proportions of variation due to dam effects were recorded at all ages comparable to those of sire. It ranged from 13.8% to 27.0% for BW (with an average of 19.0%) and 12.8% to 17.9% for both DG & AG (with an average of 14.5%).

(5) No consistent trend for estimates of heritability from paternal half-sibs ($h^2s$) was observed for growth traits. In

general, low estimates of $h^2_S$ for all growth traits were obtained which ranged from 0.041 to 0.153 with an average estimate equal to 0.097. The heritability estimates from maternal half-sibs ($h^2_D$) ranged from 0.553 to 1.079 (with an average equal to 0.760) for BW and from 0.511 to 0.717 (with an average equal to 0.614) for both DG and AG. Estimates of $h^2_D$ for RG ranged from 0.343 to 0.602 (with an average equal to 0.485). The estimates of heritability based on full-sibs ($h^2_{S+D}$) for growth traits at different age intervals were moderate or high which ranged between 0.312 to 0.606 for BW (averaged 0.429), 0.317 to 0.395 for both DG & AG (averaged 0.357) and between 0.227 to 0.360 for RG (averaged 0.289).

(6) All estimates of phenotypic correlation ($r_P$) and both of genetic ($r_G$) and environmental ($r_E$) from paternal half-sib (PHS), maternal half-sib (MHS) and full-sib (FS) components among BW, DG and AG at different ages were positive and of moderate or high magnitude, and tended to decrease in value as the differences between the two ages get larger.

(7) Expected estimates of annual direct genetic progress based on PHS for BW selected for hatch-, 2-, 4-, 6-, 8-, 10- and 12-week weight are 0.12, 0.75, 2.97, 1.74, 3.21, 2.71 and 4.23 grams per chick per generation, respectively. The corresponding estimates based on FS were 0.80, 3.41, 4.98, 7.66, 11.85, 16.42 and 22.62 grams in the same order. Selection for 4-week body weight and for both AG & RG at interval of 0-4 weeks of age have been generally associated with a moderate or high rate of expected correlated response in growth traits at subsequent ages.