SUMMARY

This study was carried out to evaluate genetic parameters and to estimate response of mass selection for 6 generations to improve body weight in a native breed of White Baladi chickens. A total number of 20 males and 200 females was taken at random for the original population. Each male was mated with 10 females in individual breeding pen. Two hatches were obtained from the same parents. The first hatch made up the selected population and the second hatch made up the random-bred population. At 8 weeks of age, mass selection based on body weight applied on the progeny of each generation of the selected population in such a way that the heaviest 20 males and 200 females were selected. The pedigreed randombred population was reproduced each generation along with the selected population. However, the 20 males used as parents were chosen at random, one male from each previous sire. Each male within each population was mated to 10 females with only a restriction that no full or half sib mating was avoided to prevent inbreeding depression. On hatch, all produced chicks were wing-banded to keep their pedigree and weighed at 8 and 12 weeks of age. Males of each generation of selected and randombred populations were slaughtered at 12 weeks of age to evaluate dressing, edible meat, blood and feather percentages.

The collected data were adjusted for sex effect within population and generation and were statistically analysied by the application of nested design with unequal number of subclasses. Tests of significance for the differences between means of populations and between generations were done according to Duncan's Multiple Range Test.

Heritabilities of the studied traits as well as Genetic, environmental and phenotypic correlations among the traits were estimated on the basis of sire, dam and sire + dam components of variances. The expected genetic gain per generation of selection; also, the expected correlated response were derived from the three components of variances.

The obtained results can be summarized as follows:

Heritability estimates for 8 and 12 week body weights, dressing and feather percentages were larger than those of edible meat and blood percentages; indicating that the first four traits were highly heritable.

Heritability estimates for all traits in the selected population were lower than those in random population; indicating that selection decreased genetic variations through fixation of genes.

Heritabilities estimated from the dam component were much higher than those derived from the sire component for the majority of the studied traits in both populations; indicating the presence of maternal effects.

Most of the genetic correlations among the studied traits based on sire components were generally positively higher than those obtained from dam components in both populations; indicating that sires inhereted their linked and/or pleiotropic genes additively to most of the traits.

The genetic relationships between 8 week body weight and each of the other traits were positively higher in random population than in selected

population; indicating that selection reduced the genetic variabilities among the studied traits.

Higher genetic correlations were obtained between 8 and 12 week body weights; also, between feather percentage and each of 8 and 12 week body weights; indicating that improving body weight by selection will be followed by improving feather development.

The genetic correlations between dressing percentage and each of 8 and 12 week body weights were lowerly negative in selected population and highly positive in random population; indicating that selection for heavier 8 week body weight did not accompany by higher dressing percentage.

The genetic and the phenotypic associations between dressing percentage and edible meat were positively higher in both populations; indicating that correlations between those two traits were automatic.

Results, also, indicated that males, females and males + females were heavier in selected population than in random population for 8 and 12 week body weights; indicating that the White Baladi breed of chickens responded largely to selection for improving body weights. However, percentages of dressing, edible meat, blood and feather were almost equal in both populations.

The average of realized progress over all generations for males + females (48.4 grams) was nearly equal to the expected genetic gain (44.1 grams). Also, the corresponding realized heritability (0.537) was nearly equal to the estimated heritability (0.489). However, the realized

genetic gain was much higher than the corresponding expected genetic gain within each generation of selection; indicating that selection for improving body weight of White Baladi breed which contains considerable amount of additive variance is unlikely to reach a selection limit in the forseeable futures.

The results, also, indicated that males responded effectively to selection than females; this was due to intensive selection pressure subjected to males (5.5%) than that of females (51.5%).

The results, also, showed that the change in 8 week body weight due to selection was associated positively with a change of about 45, 13 and 11 grams in 12 week body weight based on sire, dam and sire + dam components of variances, respectively. However, the correlated response of each percentage of dressing, edible meat, blood and feather at 12 weeks of age was rather small. This indicated that correlated response of the unselected traits with moderate heritability estimates was found when the genetic correlation with the selected trait was large, but not when it was low.