

## ***ABSTRACT***

This study was conducted at El-Takamoly project belonging to Fayoum Governorate during the period from June 2007 to February 2009. Prior to study, 17 breeds or strains were screened according to their performance as a preliminary stage.

Then ten genotypes were chosen based on their productivity White Leghorn (WL) and Rhode Island Red (RIR) as standard foreign breeds, Golden Montazah (GM), Gimmizah, Salam and Mamorah as developed strains, Fayoumi, Baladi Behairi and Dandarawi as indigenous breeds (Fay, BB and Dand, respectively) and naked neck Sharkasi chickens, to study the effect of genotype and sex on GSH-Px in the washed RBCs, BW, hematology and some plasma metabolites at 56 days of age (Stage 1). Six genotypes: BB, Dand, WL, RIR, Gimmizah and GM were used to confirm relationships between each of genotypes, sex and age with GSH-Px and BW, hematological, plasma constituents and albumin/globulin (Stage 2).

Two genotypes were chosen showing the highest enzyme activity (RIR) and the lowest enzyme activity (Gimmizah). In this stage, two crosses were made: RIR x Gimmizah and its reciprocal cross (Gimmizah x RIR dams) to study the phenotypic variation in the activity of GSH-Px in RBCs in the parental breeds and their crosses, study the crossing effects on variance components of the studied traits with an approach to both potence ratio and genetic distance (Stage 3).

### **The following results were obtained:**

1. GSH-Px activity at 56 days of age may be used as an important criteria since it had significant correlations with most studied traits of productive performance, fitness, hematological and plasma constituents.
2. Crossing between RIR and Gimmizah are associated with existence of positive and high percentages of heterotic effects on most studied traits favoring RIR as a sire and Gimmizah as a dam .
3. Most estimates of direct additive effect were positive and significant therefore, RIR as a sire was superior than Gimmizah for GSH-Px at 56 and 84 days of age, body weight at 5% of egg production, age at sexual maturity, egg number during 90 and 180 days of production, egg weight, egg mass at 90 and 180 days of egg production, yolk weight, shell weight, hematocrit at 5% of egg production, hemoglobin at 56 days of age and at 5% of egg production, red blood cells at 5% of egg production, lymphocytes% at peak of egg production, total protein at 84 days of age, 5% and peak of egg production, albumin at 28, 56, 84 days of age and at 5% of egg production, globulin at 5% and peak of egg production and albumin / globulin at 28 and 56 days of age.
4. Estimates of potence ratio ranged from no dominance to over-dominance for studied traits.
5. Most genetic distance estimates were low which may be due to the lack of additive genetic variation and insignificant differences between parental genotypes that resulted in somewhat lack in genetic divergence which expressed in small genetic distances for several traits.

**Key Words: Genetic evaluation, GSH-Px, crossbreeding effects, potence ratio and genetic distance.**