

**IMMUNOLOGICAL PARAMETERS AND LAYING PERFORMANCE OF  
NAKED NECK AND NORMALLY FEATHERED GENOTYPES  
OF CHICKEN UNDER WINTER CONDITIONS OF EGYPT**

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The study was undertaken to evaluate and measure some immunological traits and laying performance for two genotypes (heterozygous naked neck and normally feathered) of chicken under low ambient temperature. A total of 120 heterozygous naked neck (Nana) and normal plumage (nana) laying hens (60 each) were used in this experiment. The mean of high and low ambient temperatures recorded during the trial period (mid laying period, from 36 to 56 weeks of age) indoor the house were  $19\pm 1$  and  $12\pm 1$  C°, respectively. Body weight (in grams) was recorded for each hen within the two genotypes at 34 weeks of age. Also, rectal temperature was measured at the same age by inserting the rode of digital thermometer to approximate 3 cm in cloaca. To test cell-mediated immune response against phytohemagglutinin-P (PHA-P) using a wattle injection technique, twenty three mature hens aged 34 weeks were used (12 nana and 11 Nana). Using the same birds, a total of 23 females (12 nana and 11 Nana) were assigned to determine some blood traits. Total protein and albumen were determined by enzymatic methods using available commercial kits (Bio Merieux Sa 69280 Marcy I Etoile-France). Globulin level was calculated as the difference between total protein and albumen. Leucocytes, including granular (heterophils, eosinophils and basophils) and non-granular (lymphocytes and monocytes) were counted at  $\times 1000$  (oil immersion lens) until a total of 250 cells per slide was achieved. The main results can be summarized as follows. The Nana hens had heavier body weight (1584.3 vs. 1453.1g) and slightly higher body temperature as compared to nana one. According to H/L ratio and leucocyte percentages, it could be seen that the nana birds were more stressed than Nana counterparts (0.35 vs. 0.22). The results of PHA-P assay showed that the Nana hens had a significantly greater dermal swelling compared to normally feathered ones. Additionally, the normal plumage hens had a higher mortality and culling rate than heterozygous naked neck hens (11.5% vs. 10%). Concerning egg production and eggshell quality measurements, the nana hens had a better performance than Nana ones. In naked neck hens, there was a positive relationship among egg mass, egg number and cell mediated response occurs at 48 and 72h post-injection. While, in normally feathered genotype, there was a highly positive correlation between egg weight and cell-mediated response at 72h post-injection. In conclusion, under low ambient temperature, the results suggest that the naked neck laying hens showed superior immunoresponsivness and less productive performance than the normally feathered hens.

**Keywords:** Naked neck gene; immunoresponse; laying performance.