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LIST OF ABBREVIATIONS

ALT(GPT)	**Alanine aminotransferase**
AST(GOT)	**Aspartate aminotransferase**
A/G	**Albumin /Globulin ratio**
FC	**Feed conversion**
FI	**Feed intake**
Glb	**Globulin**
GLM	**General Linear Models**
g/dl	**Gram/ deciliter**
Hb	**Hemoglobin concentration**
Ht	**Hematocrit value**
Kcal	**Kilo calorie**
mg/dl	**Milligram/deciliter**
TP	**Total protein**
Vit	**Vitamin**
WBCs	**White blood cells**
µl/dl	**Microliter/ deciliter**
ng/ml	**Nanogram/ Milliliter**
Dl	**Deciliter (dl = 10^{-2} liter)**
mg	**Milligram (mg = 10^{-3} gram)**
ng	**Nanogram (ng = 10^{-9} gram)**
T_3	**Triiodothyronine hormone**
T_4	**thyroxine**
µL	**Microliter**
Kg	**Kilogram**
WKs	**Weeks**
RBCs	**Red blood cells**
WBCs	**White blood cells**
H/L	**Heterophil/Lymphocyte**
Zn	**Zinc**

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Title of Thesis Improve fertility and immunity of the Japanese quail under hot environment stress in North Africa.

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ABSTRACT

This study was conducted at Agriculture Experiments Station, belonging to Agriculture Faculty, Cairo University, Egypt. The chemical analysis was carried out at the laboratories of Animal Production Research Institute and Animal Health Research Institute.The aim of this work was to investigate the effect of addition of (Ginseng, Methionine, Vitamin E, Folic acid and Zinc) to conventional diet on the fertility and immunity of Japanese quail under hot environment stress during summer season (may -june-july) of Egypt. Birds were fed the basal diet with different additives from 6 to 20 week of age as follow:{control, 300 mg Ginseng, 0.3% Methionine , 200 mgVitamin E, 2 mg Folic acid, 60 mg Zinc / kg basal diet}. A total number of two hundred and sixteen birds of Japanese quail at 6 weeks of age, which distributed randomly into sex treatment groups. Thirty six birds were assigned to each group which divided into three replicates, each containing twelve birds (4 males and 8 females).

The main results obtained from this study can be summarized as follows:all dietary supplementation exhibited that live body weight, feed consumption, feed conversion ratio, egg production (egg weight, egg mass, Fertility and Hatchability) ($P \leq 0.05$) improved significantly compared to their counterparts in control group. But there was not significantly improved in egg quality compared to their counterparts in control group. Also the statistical analysis revealed that, the supplementation of Ginseng, Methionine, Vitamin E, Folic acid and Zinc exhibited no significant effect in each of blood biochemical measurements like Total Protein, Globulin, Total Lipid, Cholesterol, GPT, GOT, Urea, Creatinin, Calcium and Phosphorus or hormones like Progesterone and Testosterone at 20 wks of age comparing to its counterpart in Control group. However, quail laying hens fed diet supplemented with Ginseng, Vitamin E, and Folic acid were exhibited significantly ($P \leq 0.05$) higher T3 (Tri-iodothironine) hormone as compared with its value in facing un-supplemented Control hens. However, Methionine and Zinc supplementation exhibited insignificantly increased T3 (Tri-iodothironine) hormone compared to their counterparts in Control group. Supplementation of Ginseng, Methionine, Vitamin E, Folic acid and Zinc exhibited no significant effect in each of Leucocytes cells (white blood cells) (WBCS) or Erythrocytes (Red Blood Cells) (RBCS) at 20 wks of age as comparing to its counterpart in control group. There were ($P \leq 0.05$) significantly decreased in Heterophil cells and H / L ratio. However, ($P \leq 0.05$) significantly increased in Lymphocyte cells due to feeding Japanese quail laying hens on diets supplemented with Vitamin E as compared with its value in facing Control hens. In the same time, there were ($P \leq 0.05$) significantly increased in Monocyte and Eosinophil cells due to feeding Japanese quail laying hens on diets supplemented with Ginseng, Methionine, Vitamin E, Folic Acid and Zinc, with absence of Eosinophil Cells with Zinc supplementation. Also, Basophil were ($P \leq 0.05$) significantly increased due to feeding Japanese quail laying hens on diets supplemented with Methionine, Vitamin E and Folic acid, with absents of Basophil Cells with Ginseng and Zinc supplementation as compared with its value in facing Control hens. There were no significantly affect in semen chemical analysis measured as calcium, phosphorus, total protein, albumin, cholesterol, urea and creatinine due to feeding Japanese quail laying hens on diets supplemented with ginseng, methionine, vitamin E, folic acid and zinc as compared with its value in facing control hens. In Physical characteristics of diluted fresh semen or of stored, and incubated diluted semen: The supplementation of ginseng, methionine, vitamin E, folic acid and zinc to quail males diets caused ($P \leq 0.05$) significantly enhancement of mass sperm motility (Score), advanced sperm motility (%) and sperm-cell concentration at 18 wks old as compared to un-supplemental control diet. Dead spermatozoa (%), sperm abnormalities (%) and acrosomal damages (%) were ($P \leq 0.05$) significantly improved as affected by feeding quail males diet inclusion of feed additive compared with control diet.Significant improvements were not only in fresh semen but also during chilled storage semen from 1 or 3 days or during incubate the semen from 2 or 4 hours.Testicleshistopathological examination recommended that ginseng, methionine, vitamin E, folic acid and zinc supplementation to quail laying hens diet is the best than control group. Ovary histopathological examination recommended that zinc supplementation to laying hens diet is the best compared with other treatment. It could be concluded from this study that supplementation of Ginseng, Vitamin E, Methionine, Folic acid and Zinc to conventional diet of Japanese quail under hot environment stress during summer season improved fertility and immunity.

Key words: Ginseng, Vitamin E, Methionine, Folic acid,Zinc, Japanese quail, Layer, Performance, immunity.