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**PRODUCTION PERFORMANCE AND SERUM
CONSTITUENTS OF AGED GIMMIZAH HENS AS
AFFECTED BY DIETARY SUPPLEMENTATION WITH
L-CARNITINE**

BY

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Abstract: *This study investigated the effects of different dietary levels of L-carnitine supplementation on the productive, reproductive performances some physiological responses, and economic efficiency in Gimmizah laying hens . One hundred and forty four hens of 60 weeks old were randomly chosen from a large flock with insignificant differences in body weight with laying rate and were divided into 6 groups (each of 24 birds) according to L-carnitine supplementation levels 0.0 , 25, 50, 75, 100, and 125 mg L-carnitine /kg to layer diet, respectively. Birds were housed in individual wire cages during the whole experimental period (60 to 68 weeks of age).*

The results indicated that, egg weight was significantly increased ($P=0.001$), while, egg mass (gm/ hen/ day), feed conversion (gm feed / gm eggs), production efficiency, albumen weight, chick weight at hatch and serum globulin were significantly ($P=0.05$) increased by supplementation of L-carnitine to the layer diets as compared with control. Supplementation of L-carnitine level to the diet significantly increased ($P=0.01$) albumen percentage, Haugh Units score , yolk index, serum total protein and glucose , but yolk weight, yolk percentage , cholesterol and total lipids concentration in serum , cholesterol and total lipids in yolk were reduced significantly ($P=0.01$) and albumen ($P=0.05$). Fertility and hatchability percentages were significantly increased ($P=0.01$), and improved economic efficiency percentage by the addition of L-carnitine to layer diets.

It can be concluded that supplementation of 25 mg L-carnitine /kg diet, improved fertility, hatchability, economic efficiency percentages, and gave the net profit.

EFFECT OF DIETARY ALPHA YEA MIX SUPPLEMENTATION ON BROILER CHICKENS PERFORMANCE

By

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Abstract: *This experiment was conducted to investigate the effect of dietary Alpha Yea Mix (Yeast extract and Digestive enzymes) supplementation at levels of 0.1 and 0.2% on the growth performance of broiler chickens. One hundred and forty seven, one-day Hubbard broiler chicks were distributed in this study into 7 groups, (control and 6 treatments). Each group included three replicates of 7 chicks, each. The seven groups were as follows: Birds in group 1 (T1) fed the control diet from 1 to 42 days of age. Birds in groups 2 and 3 (T2 and T3) fed control diet supplemented with 0.1 and 0.2% Alpha Yea Mix, respectively from 1 to 21 days of age and then birds fed control diet until 42 days of age. Birds in groups 4 and 5 (T4 and T5) fed the control diet from 1 to 21 days of age and then fed the control diet supplemented with 0.1 and 0.2% Alpha Yea Mix, respectively from 22 to 42 days of age. Birds in groups 6 and 7 (T6 and T7) fed the control diet supplemented with 0.1 and 0.2% Alpha Yea Mix, respectively from 1 to 42 days of age.*

At 6 weeks of age, birds fed dietary of T3 recorded the best ($P=0.05$) values of body weight (BW), daily body weight gain (BWG) and cumulative feed conversion (FCR) than other dietary treatments. These improvements were 24.4, 23.7, 16.1, 21.0, 13.4 and 17.1% for BW, 25.0, 24.2, 16.5, 21.4, 13.7 and 21.4% for BWG and 18.0, 19.8, 14.0, 22.1, 19.2 and 18.0% for FCR than that of T1, T2, T4, T5, T6 and T7, respectively. The overall mean of feed consumption (FC) in control group (T1) were decreased ($P=0.05$) by 11.5, 7.1, 8.6, 16.1 and 9.7% as compared with that of T3, T4, T5, T6 and T7, respectively. No significant differences were found among all groups in carcass weight and dressing percentage. The birds fed on T3 group had the best economical efficiency (EE) value by 30% as compared with the birds of control group.

It was concluded that the broilers chicks fed control diet supplemented with 0.2% Alpha Yea Mix from 1 to 21 days of age (T3) and

then fed control diet until 42 days of age had best ($P<0.05$) growth performance and also recorded the best economical efficiency as compared with control birds fed the control diet or other dietary treatments.

EFFECT OF INITIAL CHICK BODY WEIGHT AND DEIT ON THE GROWTH PERFORMANCE OF BROILER CHICKS.

By

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Abstract: A total number of 216 unsexed one –day old Hubbard chicks were distributed into three 3 main groups (72 chicks each) according to initial chick body weight (39, 44 and 49 gm). Each main group was randomly divided into three subgroups (24 chicks each) and each subgroup contained three replicates (8 chicks each). Chicks in the first sub group were fed on starter and grower diets which formulated to meet the nutrient requirements of broiler chicks (control diet). Chicks in the second and the third subgroups were fed on starter and grower diets which formulated to have 2% less protein (low P diet) and 200 Kcal metabolizable energy (low E diet), respectively than the control group. Results of this experiment could be summarized as follows:

The effect of initial chick body weight on final body weight, daily gain, feed consumption, feed conversion and carcass traits of broilers was not significant.

Chicks fed on Low P or Low E diets showed significantly lighter body weight than those fed on control diets at 3, 5, 6 and 7 weeks of age.

Chicks fed on low P or low E diets had significantly lower daily gain compared with those fed on control diet at 2 -3 and 4 -5 weeks of age, while chicks fed on low P diet had significantly higher daily gain than those fed on control or low E diets thereafter up to 7 weeks of age.

Chicks fed on low P diet consumed significantly lower feed than those fed on low E or control diets at differet age intervals from 4 up to 7 weeks of age.

Feed conversion of chicks fed on low P or low E diets tend to be better than those fed on control diet, but the effect of level of protein or energy on cacass traits was not significant.

**RESPONSE OF BROILER CHICKS TO MICROBIAL
PHYTASE SUPPLEMENTATION IN DIETS DIFFER IN
AVAILABLE PHOSPHORUS SOURCES AND LEVELS.**

BY

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Abstract: *A total number of 840 unsexed one week old Arbor Acres broiler chicks were used in this study to determine the effect of feeding diets low in available phosphorus (AP) and supplemented with different levels of microbial phytase on broiler performance, nutrients digestibility, minerals retention, bone characteristics, and economic efficiency. Two sources of phosphorus (di – calcium phosphate being inorganic and bone meal as organic source), two levels of AP (0.35 and 0.25 %) and three levels of microbial phytase (500 , 750 and 1000 FTU / kg) were used , in addition to the control diets containing 0.45 % AP. Accordingly , chicks were randomly distributed into 14 treatments , each contained 60 birds in 3 replicates , and fed the experimental diets under similar conditions during the experimental period from 1 to 7 weeks of age .*

The best values of body weight gain and feed conversion ratio as well as bone characteristics were obtained from feeding broiler chicks diets based on bone meal at 0.35 % AP compared to those obtained from feeding di – calcium phosphate diets . Also , the addition of microbial phytase at either 750 or 1000 FTU / kg gave the best values of the studied parameters .Results showed that when dietary AP was lowered to 0.25 % , it has a negative effect on either chick performance or bone characteristics. While, the addition of 500 FTU phytase / kg failed to improve these determinations.

However, supplementing the diet with 1000 FTU phytase restore the performance to the level of the control treatment. Moreover, feeding broiler chicks on diets containing 0.35 % AP and supplemented with either 750 or 1000 FTU phytase / kg gave the highest values of economic efficiency.

In conclusion, it is possible to feed broiler chicks on low – AP diets supplemented with adding microbial phytase at 750 or 1000 FTU / kg to obtain the best values of broiler performance and bone characteristics.

**PARTIAL REPLACEMENT OF THE FISH MEAL BY
CRAYFISH (*PROCAMBARUS CLARKII*) MEAL IN DIETS
OF GROWING JAPANESE QUAIL**

BY

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Abstract: *The present study was carried out to investigate the effect of replacing dietary fish meal by different levels of fresh water Crayfish meal on growth performance, chemical and carcass composition of growing Japanese quail at different ages. Four isonitrogenous and isocaloric diets were formulated to cover the nutrient requirements of growing Japanese quail according to NRC (1994). Dietary levels of Crayfish were 0.0 % (control group), 25.0%, 50.0% and 75.0% as a replacement of fish meal protein. Japanese quail were fed the experimental diets during growing period from the 1st-day of age until the end of the 6th weeks of age. A total number of 360 quail chicks were randomly distributed into four experimental group, each in three replicates. Chicks were brooded in electrical batteries at the same conditions. Feed and water were offered ad libitum for birds during the experimental period. Birds received continuous lighting program throughout the experimental period.*

Obtained results indicated that treatment diets recorded significantly higher live body weight and gain at the end of the experiment (6th weeks of age) as compared to control group, although insignificant differences were observed among groups receiving different levels of Crayfish. Results showed that increasing proportion of Crayfish in the diet of growing Japanese quail showed no significant effect on feed consumption, feed conversion ratio, metabolizable energy intake, protein efficiency ratio and mortality rate during the whole experimental period. Concerning carcass characteristics and chemical body composition, the obtained results indicated that there were no significant differences in all parameters among all studied groups at 3 and 6 weeks of age. Heavy metals deposited in the muscles were significantly ($P < 0.05$) increased as the level of Crayfish increased in the diet.

SERUM CHEMISTRY AND MINERAL CONTENT OF NORMAL AND DEFORMED TARSOMETATARSAL OSTRICH (*STRUTHIO CAMELUS*) CHICKS

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Abstract: *To study leg deformation as a major factor affecting ostrich mortality, tarsometatarsus bones and blood samples were collected from 30 non-deformed and 30 deformed ostrich chicks aged from 2-10 weeks. Blood samples and tarsometatarsus bones were collected from the Ostrich Production Farm of the Atomic Energy Authority, Cairo, Egypt and analyzed for minerals content (Ca, P, Mg, Zn and Mn). Whereas, the following biochemical parameters were determined in the sera: total proteins, albumen, globulin, albumin/globulin ratio (A/G ratio), urea and alkaline phosphatase. The obtained results indicated that:*

1. *Chick mortality during the first 8 weeks after hatch ranged between 10 to 25%. Mortality due to leg deformation represented 5 to 15% of total chicks and 50 to 100% of dead chicks.*
2. *Mortality due to leg deformation (as percentage from total mortality) tended to increase with age indicating that leg deformities were the most important cause of post-hatch chick culling or mortality.*
3. *The levels of calcium, manganese and zinc in deformed tarsometatarsus bones were significantly lower than that in the normal ones.*
4. *Phosphorus and magnesium levels were significantly higher in the deformed tarsometatarsus bones than in the normal ones. As a result, the Ca/P and Ca/Mg ratios were significantly lower in deformed than in normal tarsometatarsus bones.*
5. *The mean serum calcium, manganese, Ca/P ratio, Ca/Mg ratio, and A/G ratio were significantly lower in ostrich chicks with deformed than with normal tarsometatarsus bones.*
6. *The mean serum alkaline phosphatase, urea, total protein, albumin, globulin, phosphorus and zinc were significantly higher in the deformed tarsometatarsus chicks than in normal ones.*

7. *No significant differences were found between mean serum magnesium of ostrich chicks with deformed and normal tarsometatarsus bones.*

SHELL PHYSICAL CHARACTERISTICS AND MINERAL CONTENT OF HATCHED AND NON HATCHED OSTRICH (*STRUTHIO CAMELUS*) EGGS

By

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Abstract: *A total of 100 ostrich eggs were collected to study the effect of egg weight loss during incubation, shell physical characteristics and shell mineral contents on hatchability. Initial and final (after 39 days of incubation) egg weights, egg weight loss during incubation, egg size, egg fertility and egg hatchability were determined. Egg shells were collected from the hatchery and classified into shells from hatched and from non-hatched (late dead in shell) eggs. Egg shell characteristics (egg shell weight as percentage of egg weight, egg shell porosity and egg shell thickness) and shell mineral contents of Ca, P, Mg, Zn, and Mn were determined. The obtained results cleared that:*

- 1- *There were no significant differences between hatched and non-hatched ostrich eggs in mean initial egg mass at set, egg size (length and width in cm), egg shell weight after hatch, egg shell thickness (mm) and mean egg shell porosity.*
- 2- *The hatched eggs had an insignificantly higher porosity than the non-hatched eggs and the percentage of eggs with low porosity (8-12 pore/cm²) was significantly higher in non-hatched eggs (30%) than in hatched ones (5.5%).*
- 3- *The percentage of abnormal egg weight loss (less than 13% and higher than 17%) was significantly higher in non-hatched than in hatched eggs indicating that the reduction in hatchability may be due to low or high egg weight loss during incubation.*
- 4- *At hatching time, weight of the dead in shell embryos was significantly higher (941.1 ± 15.3) than that in hatched chicks (717.3 ± 16.5) may be due to water retention by chick as a result of failure to lose sufficient water during incubation.*
- 5- *The egg shell content of calcium, manganese, and the ratios of Ca to P and Ca to Mg were significantly higher in non-hatched eggs than in*

hatched ones.

- 6- *The eggshell content of phosphorus and Magnesium were significantly higher in hatched eggs than in non-hatched eggs.*
- 7- *The significantly higher Mg in hatched than in non-hatched eggshells caused a significantly lower Ca/Mg ratio in eggshells of hatched than in non-hatched eggs.*
- 8- *There was no significant difference between hatched and non-hatched eggs in the zinc content of shell.*
- 9- *Low egg shell porosity and insufficient percentage weight loss during incubation are the main factors caused the reduction in hatchability.*

**PHYSIOLOGICAL AND IMMUNOLOGICAL
ADJUSTMENTS OF DIETARY ASCORBIC ACID AND
ACETYL SALICYLIC ACID IN HEAT STRESSED
JAPANESE QUAIL.**

By

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Abstract: *The effects of dietary ascorbic acid (AA), acetyl salicylic acid (ASA) and their combination on antibody production and some serum metabolites in heat stressed quail were investigated. One hundred eighty 14 day (d) old Japanese quail chicks were randomly divided into six experimental groups of 30 chicks each. The first group was fed on the basal diet (control), while groups 2, 3, 4, 5 and 6 were given a diet supplemented with 500ppm ASA, 500ppmAA, 1000ppm AA, 500ppm ASA plus 500ppmAA and 500ppmASA plus 1000ppmAA, respectively. All groups were exposed to high ambient temperature of $39 \text{ }^{\circ}\text{C} \pm 1.0$ for six hour (h), from 1000 to 1600h, on each of three consecutive d/week from the age of 14 d till the end of experiment at 42 d of age. The results showed that*

- *The rectal temperature (RT) and respiration rate (RR) were significantly reduced in all supplemental groups, especially for those on the combinations of both ASA and AA.*
- *Birds of control group recorded the highest level of both serum total protein and albumin.*
- *The lowest total lipid and cholesterol levels were reported for those on the combinations of ASA with AA compared with the other experimental groups. Similar trend was observed for glucose concentration.*
- *Quail chicks given the high level (1000ppm) of AA separately and those on combination of ASA with either the high or low level of AA had significantly higher level of calcium (Ca) and phosphorus (P) compared with remaining treatments.*
- *AA and/or ASA supplementation improve liver functions in heat stressed quail as expressed by lower serum levels of aspartate aminotransferase (AST) and alanine aminotransferase (ALT).*

- *Serum triiodothyronine (T_3) was increased significantly in quails fed on AA and ASA combinations, but serum thyroxin (T_4) was not significantly affected.*
- *Dietary ASA and/or AA enhanced humoral immunity as indicated by higher total and IgG anti-SRBC's antibodies. Additionally, resulted in higher relative lymphoid organ weights compared to control group.*
- *Better performance of heat stressed quail chicks could achieved through dietary supplementation of AA and ASA combinations comparable to other experimental groups.*

THE INFLUENCE OF GENOTYPE-BY-ENVIRONMENTAL INTERACTION ON PRODUCTIVE PERFORMANCE OF BROILER CHICKENS.

BY

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Abstract: This study was conducted to evaluate the significance of genotype-by-environment interaction for sub-tropic poultry breeding. Three environmental conditions were considered summer (32.6°C, RH, 45.1%), autumn (26.0°C, RH, 50.0%) and winter (24.4°C, RH, 53.0%) seasons. Experimental stock comprised about 500 chicks per season of four genotypes: normal (na/na f/f), naked neck (Na/na f/f), frizzled (na/na F/f) and naked neck-frizzled (Na/na F/f). Summer season had a negative effect on body weight (BW) and weight gain (WG) of broiler chicks compared to normal ambient temperature (autumn and winter seasons). Na allele significantly increased BW5, BW7 and WG5-7 by about 3.9, 4.4 and 3.8% in summer and 3.4, 4.5 and 5.1% in autumn season, respectively. Also, frizzled chicks had significantly heavier BW7 than normal ones in summer and autumn seasons by 3.2 and 2.4%. The combination between Na and F alleles had a better effect on BW7 in summer and autumn season (this superiority estimated by 9.5 and 6.2%, respectively). Moreover, the Na allele-by-season interaction had a significant effect on the BW7. However, similar result was not observed for F allele-by-season interaction. The interaction of season x Na x F was not statistically significant. Feed conversion in summer season was significantly lower by 4.5% than autumn and winter ones. There was a significant season x Na x F interaction where the naked neck and frizzled birds consumed more feed in autumn and winter seasons compared to summer one, while it had a better feed conversion by about 2.56 and 1.78% in summer and autumn. The relatively lower rectal temperature was associated with either Na or F alleles and their combinations (Na/na F/f) during all seasons. However, insignificant interaction effects were observed, where the genotype effect increased with ambient temperature. The Na and F alleles interacted with season for total fat%, which reduced by the Na allele 7.89, 8.58 and 6.72% and F allele 1.89, 3.13 and 0.81% during the three seasons, respectively. Moreover, the combination between Na and F alleles significantly reduced total fat% by 14.22, 10.35, and 9.41%, and increased breast meat% (5.78, 8.13, and

5.50%) and meat yield% (4.43, 6.71 and 4.71%) in the three seasons, respectively.

EFFECT OF DIALLEL CROSSING ON SOME GROWTH PERFORMANCE, CARCASS TRAITS AND IMMUNE RESPONSE AGAINST NEW CASTLE DISEASE VIRUS VACCINE OF JAPANESE QUAILS.

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Abstract: *Diallel cross experiment was conducted using three colored varieties of Japanese quails (Brown (BB), Golden (GG) and White (WW)) purebreds, and their reciprocal and crossbred offsprings. White Japanese quails (WW) had the highest significant body weight among purebreds at the 6th week of age (168.30 gm), and WG expressed the highest significant body weight among crossbreds (169.62 gm), and while GW had the highest body weight among reciprocal crossbreds (181.39 gm). Positive heterosis recorded for crossbreds and reciprocal on the average (1.76 % and 9.09%). Reciprocal crossbreds had the highest relative growth rate at two and three weeks (52.92 and 44.58 %). Crossbreds showed high average growth rate at 4, 5 and 6 weeks (39.30, 39.37 and 32.40%). Also positive heterosis was recorded across the preceding periods, Reciprocal crossbreds showed higher significant values than purebreds and crossbreds for shank length and keel length at the fourth and fifth weeks of age and had positive overall average heterosis percentage for shank length (6.53 and 3.18% and keel length (9.29 and 5.52%). Carcass traits did not express any significant value between purebreds, crossbreds and reciprocals. But edible percentages were the highest in purebreds (8.99%). White coturnix expressed higher antibody titer among purebreds (349.14), but its reciprocal crossbreds were non-significant high compared to crossbreds and purebreds (107.89, 103.04 and 101.62%; respectively). These results accompanied by positive heterosis of crossbreds and reciprocal crosses (1.40 and 6.20%). It was worth noted that using of White coturnix as a dam or a sire line improved performance and antibody titers against inactivated New Castle Disease (ND) virus vaccine.*

**GENETIC PARAMETERS OF BODY AND EGG WEIGHT
IN JAPANESE QUAILS (*Coturnix coturnix japonica*) USING
PARTIAL DIALLEL ANALYSES**

BY

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Abstract: *Fifty mating groups of Japanese quails (*Coturnix coturnix japonica*) were used in a partial-diallel method to estimate the genetic parameters of body and egg weight characters. Nine crosses, with two hatches each, were conducted for each group. Studied characters were measured on four chicks (offspring) for each hatch. The 450 crosses as well as the 50 groups were found to be highly significant for the five characters, whereas the two hatches were found to be highly significant for egg, hatching and 6-wk weights, significant for 2-wk weight and not significant for 4-wk weight. The highest significant mean of egg weight, hatching weight, 2-wk body weight, 4-wk body weight and 6-wk body weight were found to be 13.37 gm, 8.96 gm, 71.89gm, 116.78gm and 170.45gm, respectively. The highest significant correlation coefficient estimates were between 2-wk body weight and 4-wk body weight characters (0.83), 4-wk and 6-wk body weights (0.77) and between 2-wk and 6-wk body weights (0.69). The genetic correlation coefficients ranged from 0.005 (between egg weight and 2 -wk weight) to 0.19 (between hatching and 4 -wk body weights). The mean of the growth rate was found to be 89.32%±0.01 and it ranged from 86.38% to 91.0%. The higher significant gca value for egg weight and body weight for each of hatching, 2-wk, 4-wk and 6-wk were 0.73, 0.45, 7.67, 10.28 and 13.33, respectively. The additive variance was found to be negative and diminutive in its magnitude for both egg weight and hatch weight characters. Conversely, the dominance variance estimates were relatively higher and they ranged from 0.14 (hatching weight) to 258.33 (6-wk body weight). Heritability estimates were ranged from 0.29 (egg weight) to 0.65 for 4-wk body weight.*

HETEROSIS FROM LINE CROSSES OF TWO SELECTED
LINES OF JAPANESE QUAIL:
?- GENETIC VARIANCE COMPONENTS

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Abstract: *The statistical methods for estimating the variance components based on examination of F_2 and backcrosses of a cross between two selected lines of Japanese quail (one was selected for increase egg production and the other was selected for high 6-wk body weight) were used for some productive traits. The aim was to understand the genetic basis of the studied traits. Insignificant additive genetic variances (s^2A) were estimated being 0.0026, 0.2358, 1.7432, 2.0882, 2.066, 4.271, 0.3424 and 0.0032 for body weights at hatch (W0), 2 weeks (W2), 4 weeks (W4), 6 weeks of age (W6), body gain from 2-6 weeks of age (BG2-6), body weight at sexual maturity (BW_{SM}), age at sexual maturity (ASM) and egg weight (EW), respectively. Significant additive genetic variances 0.5175 and 59.6 were estimated for egg number (EN) and total egg mass (EM) at the 1st 90 d of production, respectively. The dominance genetic variances (s^2d) for all the studied traits appear to be larger than additive ones. Significant dominance genetic variances (27.8092, 19.0929 and 36.0387) were found for W2, BG2-6 and ASM, respectively. Otherwise, the significant epistatic relations such as additive x additive type of epistatic variances (s^2i) were 0.246 and 16.803 for W0 and BG2-6, respectively. While the significant additive x dominance gene interaction variances (s^2j) were 1.7972, 2.9184, 2.7015 and 88.1 for W4, W6, BG2-6 and EM, respectively. Also, the significant dominance x dominance gene interaction variances (0.067, 44.5755, 2.435, 110.902 and 0.0822) were estimated for W0, W4, W6, body weight at sexual maturity and EW, respectively. These results suggest that selection would be effective for both egg number and total egg mass, and crossing would be effective for improving the rest of the studied traits.*

PHYSIOLOGICAL RESPONSES AND PRODUCTIVE EFFICIENCY OF CHICKENS REARED UNDER SIWA OASIS CONDITIONS

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Abstract: *The present study was carried out in Siwa Oasis Research Station, Desert Research Center. The experiment started in July 2004 up to June 2005. The aim of this work was to evaluate the physiological responses and productive efficiency of Siwa Oasis (SO) and Fayoumi (F) chickens under Siwa Oasis conditions. Two hundred- one day old of SO and F chicks (100 chicks of each) were reared in open system from one day old to up 6 months of egg production. Blood samples were taken at 18 weeks (pre-laying), 21 weeks (sexual maturity) and 34 weeks (peak of egg production).*

Higher plasma glucose and cholesterol levels were determined ($P<0.05$) in the blood of SO than that of F chickens. While, there is no significant difference between SO and F chickens in the concentration of plasma total protein and total lipids. On the other hand, plasma glucose, total protein and total lipids concentrations increased ($P<0.05$) at sexual maturity and at the peak of production status than that of pre-laying status. While, plasma cholesterol did not significantly changed as a result of productive status.

Total white blood cells significantly increased in F than that of SO chickens, it's significantly increased at sexual maturity than that of pre-laying status then significantly decreased at the peak of production. Heterophils and lymphocytes ratio significantly lower in F than that of SO chickens, it's significantly higher at sexual maturity and at peak of production than that of pre-laying status.

There were insignificant differences between SO and F chickens in age at sexual maturity, egg number and feed conversion. Body weight at sexual maturity and peak of production, first egg weight, average egg weight, egg mass and feed consumption values of SO were significantly higher than that of F chickens.

Results of this study declared that, there was a similarity in the most of physiological responses and productive efficiency of Fayoumi and Siwa Oasis chickens under Siwa Oasis conditions.

GENETIC TRENDS AND EVALUATION FOR SOME PRODUCTIVE TRAITS IN ALEXANDRIA CHICKENS

By

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Abstract: *This study was carried out on data obtained from the experimental stocks at the Poultry Research Center, Faculty of Agriculture, University of Alexandria, during seven successive years. The experimental stocks comprised two developed lines of Alexandria chickens originated from the base population, through individual selection for high (HL) and low (LL) body weight at 8-week and one population of the Fayoumi (FA) flock kept closed without selection for any trait and used as a control breed.*

Data of 6989, 9128 and 2349 chicks produced from LL, HL and FA populations, respectively, were recorded for traits of body weight at hatch (BWH), 8-weeks (BW8), sexual maturity (BWSM) of age, number of day alive during the period from hatch up to 8 weeks (DL0-8) of age and age at sexual maturity (ASM). Single trait animal model was used to analyze the data. Results showed that estimates of Heritability (h_a^2) for body weight were higher at hatch for the Alexandria HL (0.62) and FA breed (0.36) than at 8-weeks of age (0.29 and 0.17, respectively). While the reverse was true for the LL of Alexandria chickens. Estimates of h for AGSM were about the same for the LL line (0.06) and FA breed (0.06). While the FA line had higher estimate of h_a^2 (0.09). Estimates of genetic correlations (r_G) between productive traits were generally negative and low. It ranged from -0.35 to 0.301 in LL, -0.25 to 0.23 in HL and -0.96 to 0.22 in FA populations. The corresponding estimates of the phenotypic correlations (r_p) were -0.43 to 0.42, -0.43 to 0.34 and -0.89 to 0.362 in the same order.

Genetic trends in LL, HL and FA populations indicate that PBV were mostly positive for all the studied traits. But the plots in LL line showed that the minimum of predicted breeding values for BW8 reached at

the 3rd generation of the study and the plateau reached soon at the 4th generation. While, the plots in HL line indicate that the plateau for BW8 and BWSM reached soon at the 2nd generation, then trends fluctuated to show second plateau at the 5th generation. For FA breed, the plots for BW8 and BWSM were gradually increased to reached the maximum point at the 7th generation. This is due to no selection was practiced in this population. On the other hand, genetic trends for traits of BWH, DLO-8 and AGSM indicate that the change in plots were very low and it had stability after the 2nd generation.

ROLE OF CHICKEN INTERLEUKIN 2, IN SOME IMMUNOLOGICAL AND PRODUCTION PERFORMANCES OF FAYOUMI CHICKENS

By

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Abstract: *A study was carried out to determine the impact of chicken interleukin 2 rich supernatant (ChIL2-rich supernatant), simultaneously injected with antigens, on humoral immune responses, and its side effects on production performance. Chicken IL2-rich supernatant was co-administered with SRBC and NDV antigens to 40-week old Fayoumi chickens. The control birds were injected with saline. Data were collected during the period from 40 to 45 weeks of age, for parental birds, and for the first three weeks of age, for their progeny.*

The results indicated that ChIL2-rich supernatant injection enhanced the humoral immune response against SRBC and NDV antigens throughout the experimental period. It also, increased the relative spleen weight. On the other hand, ChIL2-rich supernatant injection did not influence hen day egg production, egg weight, fertility or hatchability. The positive effect of ChIL2-rich supernatant, injection on maternal antibodies was observed, only, just at the day of hatch of chicks from eggs collected from days 8 to 13 post ChIL2-rich supernatant injection.

The results in this study demonstrated that, ChIL2-rich supernatant injection could be safely used as an adjuvant to enhance the humoral immune response and maternal immunity against an experimental antigen (SRBC) or a pathogen (NDV).

EFFECT OF INCUBATION AND BROODING TEMPERATURES ON SOME PHYSIOLOGICAL RESPONSES AND HEAT SHOCK PROTEIN70 IN MUSCOVY DUCKS

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Abstract: 750 Muscovy duck eggs were submitted to normal (37.8°C), low (36.8°C) or high (38.8°C) temperatures during the last 7 days of incubation. After hatching at day 5, ducklings of each treatment were divided into two groups. First group (control) was kept under normal ambient temperature during the experiment and second group (early acclimation) was exposed to 38°C for 24hr at day 5 of age. All groups exposed to high temperature (42°C) for 4hr at 9 weeks of age.

Ducklings incubated at high temperature had significantly higher in body temperature as compared to other treatments at one day of hatching, however, gene expression of HSP70 significantly decreased in birds obtained from eggs incubated in high or low incubation temperatures as compared to normal incubation temperature at 1d post-hatching.

At 9 weeks of age, respiration rate and gene expression of HSP70 were higher in all early acclimated birds as compared with control birds during heat stress. There were no influences of incubation temperatures on plasma total lipids and packed cell volume % (PCV%) at one day of hatching, while, low incubation temperature caused an increase in T₃ concentration as compared to other treatments. While, at 9 weeks of age total lipids, T₃ concentrations and PCV% were significantly decreased in early acclimated birds as compared to control groups during heat stress.

The opposite trend was observed in body temperature as compared to non-acclimated birds after heat stress.

EFFECTS OF DIVERGENT SELECTION FOR PRIMARY ANTIBODY TITERS AGAINST SHEEP RED BLOOD CELLS ON SOME IMMUNOLOGICAL AND PRODUCTIVE PERFORMANCE OF CHICKENS

By

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Abstract: *Three lines of Fayoumi chickens were immunized against sheep red blood cells (SRBC) and Newcastle Disease Virus (NDV) antigens, at 40 weeks of age. Two lines were divergently selected for high (H-line) and low (L-line) antibody response to SRBC at 50 days of age for four generations. The third was a random bred line, and served as a control (C-line). Data were collected during the period from the onset of production to 45 weeks of age on the parents stock, and the first three weeks of age on their progeny. Antibody titers against SRBC and NDV antigens in hens and their progeny of the three lines were obtained. Hen-day egg production, egg weight, fertility and hatchability were also evaluated.*

The results indicated that the H-line had the highest secondary immune response to both SRBC and NDV antigens. This in turn enhanced the amount of antibodies transferred from the hens to their progeny. The divergent selection for primary antibody titers against SRBC did not influence the hen-day egg production. However, the Lline produced significantly heavier eggs than the H-line, and had significantly higher fertility and hatchability than the C-line.

It could be concluded that antibody response to SRBC antigen could be included in selection indices as a selection criteria. This is to produce commercial chicken strains that are more immune responsive.

ASSESSMENT OF BOOSTER RE-VACCINATION OF GRAND-PARENT HENS WITH INACTIVATED VACCINES, DURING EGG PRODUCTION

By

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Abstract: *The important question addressed in this study was to determine whether booster re-vaccination of grand-parent hens, with inactivated vaccines against some viral diseases, during the production period, improve their ability to transmit antibodies to their progeny. The immune response of hens and their productive performance were evaluated. For this purpose a total number of 200 hens and 20 males of Hubbard grand-parents' female lines were used.*

At 21 weeks of age, the birds were randomly divided into two groups, each of 100 females and 10 males. The first group was vaccinated at 21 and 42 weeks of age (re-vaccinated), using inactivated tetravalent oil based vaccine (NDV+ IBDV + IBV + Reo virus). The second group was vaccinated only at 21 weeks of age by using the same inactivated tetravalent vaccine and served as a control group. Data were collected from 34 to 66 weeks of age.

The results indicated that, the re-vaccinated grand-parent hens, with tetravalent inactivated vaccine, had more uniformity and higher specific antibody titers, as compared to the control ones. Hen-day egg production, fertility or hatchability was not affected by vaccination program. In addition, booster re-vaccination of grand-parent hens allowed them to produce chicks with significantly higher maternal antibody levels and less number of chicks without detectable maternal antibodies (unprotected chicks), as compared to the control ones.

It could be concluded that a booster re-vaccination of hens with inactivated vaccines, during egg production period, was a useful tool to keep the hens' antibody titers in uniform high levels. These high levels resulted in producing chicks with high maternal antibody titers, and it minimized the number of unprotected chicks.

**AN ATTEMPT TO ALLEVIATE HEAT STRESS OF
BROILER CHICKS (DURING SUMMER SEASON)
THROUGH STOCKING DENSITY, DIETARY ORGANIC
SELENIUM (SEL-PLEX) AND VITAMIN E-SELEMIUM**

By

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Abstract: *This study was conducted to alleviate heat stress and to determine the effects of organic selenium (Sel-Plex) and vitamin E selenium (E-Sel) on performance, blood constituents and feathering scores of broiler reared under chronic heat stress during summer season (30.0-43.5°C). A total of 180, one-day-old broiler chicks were randomly assigned to two stocking density and three selenium treatments, with two replicates of 15 birds each. A 3 x 2 x 2 factorial design was used, factors were received vitamin Sel-Plex, E-Sel and basal diet as control, two stocking densities of 10 and 8 bird/m². Body weights and feed conversions were determined at hatch, 2, 4 and 6 weeks of age, and mortality was recorded on a daily basis. Scores of feather tracts were scored subjectively on the basis of feather size and skin surface covered at 21, 28, 35, and 42 d of age. Birds received organic selenium (Sel-Plex) in their diets had been improved body weight, feed conversion and livability compared to E-Sel and control groups. Selenium supplementation increased feathering, with organic selenium (selenised yeast) being superior to inorganic selenium (sodium selenite). Sel-Plex induced the fastest whole body feathering. The influence of Sel-Plex was evident from 21 through 42 d of age. Feathering of broilers in the low stocking density was slightly faster than the feathering of broilers in the high stocking density. The levels of triiodothyronine (T₃) and thyroxine (T₄) were significantly lowered in the control group as compared to selenium treatments groups. Plasma concentration of glucose, cholesterol, total protein and globulin were significantly higher in the control group as compared to selenium treatment groups. From this study, it could be concluded that supplementation of organic Se (Sel-Plex) or vitamin E+Se (E-Sel) showed better growth improvement in the performance of broiler*

chicks reared under heat stress and these additives are considered as a protective management practice in broiler diets to alleviate the adverse effects of heat stress under hot climates.