

Effect of some biotechnological methodology on some productive and reproductive traits in fow

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5. SUMMARY AND CONCLUSION The present study was carried out at the Poultry Research Farm, Department of Animal Production, Faculty of Agriculture, Zagazig University, Benha branch. Genomic DNA isolation and purification was fulfilled at a laboratories belonging to the Department of Genetic of the same faculty. The incubation was carried out at incubating station belonging to El-Takamoly Poultry Project El- Fayoum Governorate. The experiment latest a period of three years starting from October 2000 to October 2003. It was aimed to investigate the effect of DNA transformation from the White Leghorn male to embryos of an improved strain for egg production (pp) that originated from native breed Fayoumi. A total number of 1200 eggs from pullets of Fayoumi strain (pp) were subjected to treatments. Eggs were divided into two groups each of 600 eggs. Eggs of the first group were treated just before they were set in the incubator while those of the second group was treated (i.e. at the 72nd hours) of the incubation period. Egg of each group was subdivided into 6 subgroups each of 100 eggs. Eggs of the first three subgroups were injected with three doses of DNA (10, 25 and 40 lig DNA in 20 ml distilled water). While those of the second three subgroups were considered controls (drilled eggs, eggs injected with distilled water (20 pi) and untreated eggs). Results obtained could be summarized as follows: - Hatchability percent did not affected by time of inserting the foreign DNA. Average of hatchability percent mounted 87.47% for eggs treated before incubation and 87.36% in eggs treated at 72nd hrs of incubation period. - Increasing DNA level up to 40 lig significantly decreased the hatchability to a most lower level that reached 78.74% while decreasing this level up to 25 lig significantly increased hatchability than did the level of 10 lig DNA level. - Treating incubated eggs with foreign DNA in general decreased hatchability when compared with controls (untreated, a sham and water treated eggs). - Highest hatchability average was obtained from eggs of a sham group (94.35%) when compared to eggs treated with distilled water (92.72%) or untreated ones (91.66%). - Embryonic mortality was mostly higher when treatments were applied before incubation than when applied at the 72nd hrs of incubation period. - Total embryonic mortality was slightly higher when treatments were applied at the 72nd hrs (12.64%) than when carried out before hatch (12.53%). - Introducing foreign DNA into Fayoumi incubated eggs increased significantly the percentage of embryonic mortality at various stages of incubation period except during the periods from 1 to 7 days of incubation period. - Embryonic mortality as well as percentage of abnormalities increased as the level of foreign DNA injected increased. - The highest mortality percentages were observed when injected DNA level reached 40 lig, while the lowest percentages were found in eggs injected with 25 lig foreign DNA. - Chicks hatched from eggs that treated with 25 lig foreign DNA showed higher body weight at hatch (29.00 g) than those hatched from eggs treated with either 10 lig foreign DNA (28.95 g) or 40 lig foreign DNA (28.87 g). - Chicks hatched from eggs of the three control groups (water injected, sham and untreated eggs showed approximately similarly body weight that ranged between (28.45 g and 28.66 g). - Chicks were hatched from treating eggs at the 72nd hrs of incubation period results in relative higher monthly average bodyweight up to the sexual maturity. - Monthly average body weight significantly decreased as the level of DNA injected into eggs reached 40 lig. It was quite true at all periods of estimation. Monthly body weight seemed better at all periods of estimation as the level of foreign DNA injected increased to 25 lig. - Chicks hatched from eggs

injected with foreign DNA at the 72nd hrs of incubation period showed significantly higher body weight average at sexual maturity (1309.22 g) and at the peak of egg production (1384.96 g) than chicks hatched from eggs treated just before incubation (average body weight mounted 1262.79 g at sexual maturity and 1333.72 g at peak of eggproduction).- The interaction between time and level of injecting foreign DNA was found to be of highly significant importance on the average body weight of hatched chicks at sexual maturity and at the peak of egg production.- Chicks hatched from eggs treated with various levels of foreign DNA at the 72nd hrs of incubation period had relatively higher average of body weight at either sexual maturity or at the peak of egg production than did chicks hatched from eggs treated just before incubation.- Highly significant differences were found between average body weight at molt for chicks of a shim group (1495.35 g) and of those hatched from either untreated eggs (1376.86 g) or treated with distilled water (1373.06 g) which showed approximately similar average.- Applying treatment at 72nd hrs of hatch resulted in higher body weight gain than did applying treatment just before the onset of incubation.- Inserting White Leghorn DNA into Fayoumi incubated eggs significantly increased body weight gain of hatched chicks all over the period up to age of sexual maturity.- Applying foreign DNA at a level 25 pg had better result in increasing average of body weight gain than did applying the level of 10 pg, while the level of 40 pg decrease body weight gain but remained higher than that obtained from controls.- The effect of interaction between time and level of the DNA injected on average body weight gain was found to be of significant value all over the experimental period.- Chicks hatched from eggs treated before incubation had higher average of body weight gain at sexual maturity (91.96 g) than those hatched from eggs treated at 72nd hrs of incubation (83.56 g). Opposite result was obtained at the peak of egg production. Average body weight gain mounted 70.93 g and 75.75 g in chicks hatched from eggs treated either before incubation or at the 72' hrs of incubation, respectively.- Body weight gain at sexual maturity and at the peak of egg production was significantly affected by the level of foreign DNA injected.- Injecting eggs at the 72nd hours after incubation increased the rate of growth in hatched chicks than did injecting then before incubation up to the fourth month of age.- Chicks hatched from eggs treated before hatch showed higher growth rate during the period from the 5th month of hatch up to sexual maturity than those hatched from eggs treated at the third day of incubation.- Chicks hatched from eggs injected with 25 lig foreign DNA showed the highest growth rate till the 2nd comparing with those injected with the other two levels applied (10 and 40 p.g).- The effect of interaction between time and level of the DNA injected on average growth rate was found to be of significant value all over the period of estimation except at 3rd and 4th months of age.- Chicks hatched from eggs treated with 25 lig foreign DNA had the higher growth rate at either peak of egg production or at molt follow by those treated with 10 viz there by chicks of 40 lig foreign DNA injected.- Treatment applied showed its significant effect on average of feed consumption only at the 4th and 5th months of age as well as at age of sexual maturity and when the egg production rate reached its peak.- The higher average of feed consumption was obtained at the 4th and 5th months of age in birds hatched from eggs injected with 40 1.1g foreign DNA. It mounted 116.19 and 116.38 g/bird/day.- The higher average of feed consumption estimated at sexual maturity and at the peak of egg production was obtained from group of birds hatched from eggs treated with 25 vtg foreign DNA.- During the period from the first up to fifth month of bird's age average of feed conversion was better in birds hatched from eggs treated with foreign DNA just before incubation time.- Injected incubating eggs with 25 lig foreign DNA almost improved the average of feed conversion in birds hatched from, that was approximately true all over the intervals of estimation.- Chicks hatched from eggs injected with White Leghorn DNA after 3 days of incubation period sexually matured earlier (after 190.10 days) than those treated just before incubation (matured after 193.93 days).- Chicks hatched from treated eggs with any level of foreign DNA matured 7.5 to 13.9 days earlier than chicks of differ control groups, the earliest age at sexually maturity (182.30 days) was recorded for chicks hatched from eggs treated with 25 p.g foreign DNA while the latest age (189.90 days) was found in chicks of 40 p.g foreign DNA, while age at sexual maturity of chicks hatched from eggs treated with 10 ilg foreign DNA lies intermediate to the previous two mentioned the time of applying foreign DNA injection.- Pullets hatched from eggs treated just before incubation showed significantly higher egg production percentage (45.28%/hen/day) when compared to those treated at the third day

of incubation period (41.40%/hen/day).- The average percentage of egg production increased as level of injected foreign DNA increased up to- Pullets hatched from eggs injected with foreign DNA just before the onset of incubation laid eggs significantly heavier (43.18 g) when compared with those hatched from eggs treated at the third day of incubation (42.45 g).- Pullets hatched from eggs injected with 25 μ g foreign DNA had the highest average egg weight (44.92 g) compared with those injected with 10, 40 μ g DNA by average egg weight (44.31 and 44.13 g, respectively).- The egg mass was higher in pullets hatched from eggs treated before incubation (19.65 g/hen/day) when compared with pullets hatched from eggs treated at the 72nd hr from incubation period 17.68 g/hen/day.- Egg mass increased as dose of injected foreign DNA increased from 10 μ g to 25 μ g while it decreased when dose increased to 40 μ g. Egg mass averaged 18.25, 20.86 and 19.07 g/hen/day for birds hatched from eggs injected with 10, 25 and 40 μ g foreign DNA, respectively.- Level of foreign DNA injected had highly significant effect on both absolute and relative egg albumen weight. Absolute and relative egg albumen increased as level of injected foreign DNA increased up to the level of 25 μ g while they decreased as this level increased to 40 μ g.- Relative egg albumen weight increased significantly in eggs produced from pullets of a sham group when compared with those produced from pullets injected with different levels of foreign DNA.- Pullets hatched from eggs injected with foreign DNA just before incubation laid eggs with higher absolute yolk weight (13.07 g) than those hatched from eggs injected at the 72nd hrs after incubation (12.89 g).- Relative egg yolk weight increased as level of foreign DNA increased up to 40 μ g. While absolute egg yolk weight increased, as level of foreign DNA injected increased to 25 μ g then decreased thereafter.- Time of injecting foreign DNA seemed to affect significantly the proportional egg shell weight only.- Pullets hatched from eggs treated just before incubation laid eggs with relatively low proportional shell weight (12.93%) than those hatched from eggs treated at 72nd hrs of incubation (13.10%).- The shell thickness of egg laid by pullets hatched from eggs treated at the 72nd hrs of incubation period was significantly higher (31.38 mm) than of those hatched from eggs treated before incubation (31.02 mm).- High significant variation in total calcium absorption in mg/hr due to intestinal portion within time of injecting foreign DNA (I x P).- Calcium absorption per each (cm) length per (hr) was found to be significantly affected with the intestinal portion and varied in different portions of the small intestine within time of injection foreign DNA (I x P).- Calcium absorption per each gm dry matter of different intestinal regions differed significantly due to the level of injected foreign DNA and the different intestinal portions.- The time of inserting foreign DNA and level of insertion had significant effect on the albumin/globulin ratio in blood plasma.- The A/G ratio in the birds hatched from eggs treated with 10 μ g foreign DNA was higher (1.22) than in that hatched from eggs injected with either 25 μ g (1.15) or 40 μ g (1.14).- The interaction between injecting time and estimation time showed significant effect on ($P < 0.01$) on average plasma total proteins, albumin and globulin levels.- Chicks hatched from eggs with 40 μ g foreign DNA and chicks of a sham group (hatch from eggs that was just drilled) had the highest plasma level of total lipids (averages mounted 253.80 and 244.26 mg/100 ml, respectively) when compared with chicks of other groups.- The highest plasma cholesterol levels were found in chicks hatched from eggs injected with distilled water, untreated eggs and eggs of a sham groups (the corresponding averages were 125.30, 124.42 and 124.34 mg/100 ml, respectively) when compared with chicks of the other experimental groups.- Significant effects were found due to level of injected foreign DNA on both plasma total lipids and cholesterol contents.- The interaction between injection time and treatments applied showed significant effect ($P < 0.05$) on average of plasma levels of total lipids.- Chicks hatched from eggs injected with foreign DNA after 72 hrs of incubation had the highest average of plasma GOT (57.14 U/L) when compared with those hatched from eggs injected before incubation (56.40 U/L).- Highly significant effect ($P < 0.001$) due to the time of injection foreign DNA on plasma GOT only.- Chicks hatched from eggs injected with 25 μ g foreign DNA had the highest values of plasma GOT and GPT (59.75, 15.77 U/L, respectively) when compared with those of other treatments applied.- Highly significant effect ($P < 0.001$) was found on plasma level of GOT and GPT due to treatments applied.- Highly significant effects were found due to the level of the foreign DNA injected into the incubated eggs on plasma alkaline phosphatase, calcium and inorganic phosphorus.- Plasma calcium level was significantly affected with the interaction between time of

injecting foreign DNA and the level of injected and between level of injected foreign DNA and time of estimation (bird's age).- No significant structural abnormalities occurred as the treatment applied.- Significant higher average of haploid and total numerical abnormalities in chromosomes the examined spreads.- Chicks hatched from eggs injected with different levels of foreign DNA had the higher chromosomal abnormalities than control groups (eggs injected with distilled water, eggs drilled only and untreated eggs). This was quite true if injection was carried out either before incubation or after 72 hrs from incubation.