SUMMARY AND CONCLUSION

The present study was carried out during 1996-1998 at Cell Biology Department, Genetic Engineering and Biotechnology Division, National Research Center (NRC) Dokki, Giza and the poultry research farm (quails project), Animal Production Department, Faculty of Agriculture, Cairo University, Egypt. The purpose of this study was the transfer of ducks growth hormone gene and total DNA to fertilized eggs of Japanese quails as a trial for producing strains with large body size and good quality.

The ducks have some advantages: -

It is economical foods among poultry, grow quickly, having high body weight and high percentage of protein and lipids in meet.

The Japanese quails have some advantages: -

a. It is capable of processing post translational modification; b. It is an economical food among poultry, c. Grow quickly, time of generation 6 weeks, d-The eggs protect from asthma disease and meat relish good. Finally Japanese quails have been utilized as research animal to establish genetic relationships that may be present among other poultry species.

The plan of work included many steps, which can be summarized as follows: -

1-The purification and measurement of ducks growth hormone gene.

2-The isolation of genetic material (DNA) from pituitary gland ducks and measured.

3-Injection of ducks GH gene and DNA in air sac in egg Japanese quails with 10 and 20µg/egg of F_1.

4-Injection of ducks GH gene and DNA in embryo Japanese quails with 10and 20µg/egg of F_1.

5- The effect of combined effect (Li+ electroporation) with ducks GH gene and DNA on Japanese quail eggs of F_1.

6-Production F_2 and F_3 from F_1 in all treatments.

7- Measurement of fertility, hatchabilty percentage, hatch body weight, (one day age) body weight at 2 weeks, 4 weeks and 6 weeks in all treatments and control birds in F_1, F_2 and F_3.

8-Measurement of GH level of control and treatments (air sac, embryo eggs and combined effect) in F_1, F_2 and F_3.

9- The determination of total protein using spectrophtometric method.

10-The gel SDS - PAGE of total protein.

11-The agarose gel electrophoresis of DNA bands.

12-Cytological examination to estimate the chromosomal changes of all treatments and control from F_1, F_2 and F_3.

The results of this work indicate the following: -

1-Transgenic quails injected with ducks GH gene and DNA gain larger weight than that of control quails.

2-Transgenic quails injected with ducks GH gene gain larger weight than that injected with ducks DNA.

3-Transgenic quails combined effect Li+ Electro., with ducks GH gene gain larger weight than that combined effect with ducks DNA and non transgenic quails

4-The hatching percentage was higher by using combined effect than micro-injection but it was higher in injection in air sac than embryo.

5-The larger size of quails was stable genetically from F_1 to F_3.

6-In addition to the increase in body weight there was a new feather appeared with injection of DNA only. But the increase in body size was greater by injection with GH gene.

7-The level of GH was higher through injection with ducks GH gene injection in air sac, embryo and combined effect than through DNA and control, but the increase level of GH was within the normal range of GH for birds. This means that the transfer of GH gene is safe.

8- Total protein percentage was higher through injection with ducks GH gene than through ducks DNA and control showing stable inheritance from F_1 to F_3.

9-The SDS-PAGE of protein showed an increase of new three bands in the treated quails than control showing stable inheritance from F_2 to F_3.

1o-The agarose gel electrophoresis of total DNA using the restricted enzyme (E coRI) showed an increase of new one band in treatments, F_1, F_2, F_3 and donor. In addition it showed a smeared pattern intensity appeared on the gel in donor, treatments, F_1, F_2 and F_3 than control and stable from F_1 to F_3.

11-The numerical change percentage was higher than structural changes percentage in; F_1, F_2 and F_3 birds. But this increase was non-significant.

12-The chromosomal changes percentage was higher in treatments (air sac, embryo and combined effect) than control.

13-The haploid percentage showed the highest numerical changes in all groups compared monosomic, dimonosomic, tetrasomic and triploid percentages.

14-The centromeric attenuation showed higher percentages in structural changes in all groups than break percentage.

15-The highest chromosomal change percentage was observed through injection with ducks DNA followed by GH gene in embryos, air sac and combined effect.

16-The highest chromosomal changes percentage was observed in F_1 among all generations examined.