

### Summary

This study was Carried out at the Poultry research farm of the Department of animal production , Faculty of Agriculture , Cairo University with cooperation of the Department of Animal and Poultry production , Faculty of Agriculture at Moshtohor , Zagazig University , Benha Branch .

It was intended to study the nature of growth and to estimate the genetic and non-genetic Variances, heritabilities as well as genetic, phenotypic and environmental Correlations for traits of body weight from one day old up to 24 week of age on each sex of pure bred white Pekin ducks produced from two Series of mating system in three generations .

The adjusted data within each generation were statistically analysed by the application of Factorial design with unequal number of subclasses described by Becker (1975). Results obtained in body weight, absolute, relative gain and accumulative increase in body weight at different ages Can be summarized as follows :

1. The nature of growth of this flock could be Classified into three stages. The first stage was characterized by rapid growth during the period from one -day old up the age of eight weeks . Each of absolute and relative gain from one- day to 2 weeks of age were 100.0 grams and 112 % ,while from 6-8 weeks of age they were 180.0 grams and 36%; respectively. In addition body weght at 8 weeks of age was about 17 times that of one-day old.

The second stage of growth from 8-14 weeks of age, was characterized by nearly absolute gain (about 200 grams. ) in body weight during each period of 8-10, 10-12 and 12-14 weeks of age with respective relative gains of 29.3% 25. 3% and 18. 1%. The accumulative increases in body weight at 10 and 14 weeks of age were about 22 and 34 times that of one day old; respectively.

The third stage was during the period from 16-24 weeks of age which was characterized by a gradual decrease in absolute and relative gain which reached 100.0 grams and 9% during the period of 14-16 weeks of age and decreased till it reached about 33.0 grams and 2% during the period of 22-24 weeks of age. In addition body weight at 16 and 24 weeks of age were about 36 and 39 times that of one-day old; respectively.

2. Males were significantly heavier in their body weight than females at all ages. The absolute gain in body weight for males versus females during the period of one- day old to 2 weeks , 6-8 weeks and 12-14 weeks of age were 90 V.S. 78, 196 V.S. 140 and 228 V.S. 169 grams; respectively, and the respective relative gains were 114% V.S. 104. 7%, 40. 3% V.S. 35.3% and 20. 6% V.S. 18.0% . While the accumulative increases were 3.5 V.S. 3.2, 16.4V.S> 13.0 and 34. 3.V.S.28.7 times that of one-day old ; respectively.
3. The obtained results showed that generation had a highly significant effect on body weight at all age. The  $F_3$  progeny were heavier than

each of  $F_1$  and  $F_2$  Progeny. The respective absolute gain during the periods of one-day old to 2 weeks, 6 to 8 weeks and 12 to 14 weeks of age for  $F_1$  Versus  $F_2$  Versus  $F_3$  were 52 V.S. 90 V.S. 156, 144 V.S. 144 V.S. 250 and 196 V.S. 189 V.S. 211 grams. While the respective relative gains were (84, 114 and 139%), (43, 34 and 36%) and (23, 19 and 15%). Meanwhile the accumulative increases were (2.3, 3.6 and 5.5), (10.8, 14.6 and 24) and (26, 32 and 44) times that of one-day body weight ; respectively.

4. The results indicated that there were no significant difference between sires and between group of dams for body weight of males , females and males + females at most ages within each generation . Also , the sire X group of dams interactions were not statistically significant which means that the non-additive genetic component was not of significant effect on body weight , therefore , the sire and the dams were , more or less , genetically homozygous and therefore, inherited their progeny almost similar genetic make up for body weight within each generation .
5. The respective  $6^2_s$  and  $6^2_d$  (over all ages) in male progeny were relatively higher (13.05 % and 11.38%) . than those in female progeny (9.85% and 8.61% ) . In addition sires contributed by about 14.65 % and 9.78 % while dams contributed by about 12.77% and 10.55% of the total variance of body weight of male progeny during the first 14 weeks and during the period from 16-24 weeks of age , respectively .

The respective estimates on female progeny were 9.92 % and 9.72% for sires and 7.58 % and 10.76 % for dams .

6. Maternal effect on male and female progeny was of negligible values. However, sex linkage effect was relatively higher during the first 14 weeks of age in both sexes .
7. Heritability estimates of  $h^2_s$ ,  $h^2_d$  and  $h^2_{s+d}$  in male progeny (over all ages) averaged 0.474 , 0.434 and 0.459 , respectively . while the respective overages in females were 0.343 , 0.317 and 0.346 . The results revealed that the heritability estimates were relatively higher in male than those estimated in female progeny at a relatively earlier ages . Meanwhile the estimates of  $h^2_s$  in males and females were relatively higher than those of  $h^2_d$  and the estimates of  $h^2_{s+d}$  were in between .

In addition the estimates of  $h^2_s$ ,  $h^2_d$  and  $h^2_{s+d}$  in male versus female progeny during the first 14 weeks of age averaged 0.536 , 0.319 and 0.448 V.S. 0.266 , 0.500 and 0.313 , respectively . However , the respective values during the period 16-24 weeks of age averaged 0.380 , 0.389 and 0.432 V.S. 0.475 , 0.406 and 0.410 . Thus , body weight in males is controlled additively more than in females , and therefore , males might be efficiently respond to selection than females .

8. The genetic and the phenotypic correlations coefficients in adjusted sex based on full-sibs among traits of body weight at different ages were possitively low in most cases , while the enviromental correlations were relatively positively high .