ABSTRACT

The present study conducted to improve egg number of Dandarawi chickens by selection for high egg number produced during the first 90 days of production, estimate the correlated responses to selection for some laying productive traits and the phenotypic and genetic correlations between selected and correlated traits. It lasted for one generation (G_1) after establishing the base generation (G_0). Two Dandarawi lines were developed in this study in the G_1: (S) line was selected for high egg number produced during the first 90 days of production and the randombred control line (C) was maintained as non-selected pedigreed.

The following criteria were measured or calculated: Age at first egg recorded in days for each hen (AFE), number of days needed to produce the first ten eggs and egg mass of the same period was recorded for each hen (ND_{10} and EM_{10}), egg number (egg), egg weight (g) and egg mass (g) from maturity up to 90 and 120 days of egg production were recorded for each hen (EN, EW and EM). Number of eggs per clutch of each hen was calculated by dividing egg number by number of clutches ($CS_{90,\ 120}$), number of clutches ($CN_{90,\ 120}$), average length of pause duration the non–production days ($PD_{90,\ 120}$) and occurrence number of pauses ($PN_{90,\ 120}$) were recorded at the end of the first 90 and 120 days of production, the percentages of Albumen (Alb%), Yolk (Y%), Shell (Sh%),Yolk index (YI), Haugh unit (HU), egg shape index (SI) and Shell thickness (ShT).

The results showed that:

1. EN_{90} increased from 50.46 in the base generation to 63.13 eggs after one generation of family selection.
2. The direct response was higher than the expected response (2.94 vs1.14eggs).
3. The realized heritability for EN_{90} was 0.17 in the G_1, whereas the heritability was 0.08 in the G_0.
4. The G1 pullets matured earlier than those of the G_0 by 5.64 days.
5. The G_1 hens had lower periods of ND_{10} than G_0 hens (16.91 vs 17.69 days).
6. EM_{10} was obtained in the G_0 hens exceeded those of the G_1 hens by the difference of 8.91g. Concerning, EM_{90} and EM_{120}, the G_1 had significantly ($p \leq 0.05$) higher values than the G_0 hens.
7. In general, G_1 had higher values of EM than the G_0.
8. Eggs from G_0 hens showed significantly ($p \leq 0.05$) higher SI% than those of the G_1 hens (79.91 vs 76.65%). The G_0 hens had significantly ($p \leq 0.05$) thicker shells than those of the G_1 hens (0.40 vs 0.37mm).

9. S line hens were earlier at AFE than those of C line by 3.90 days.

10. The S line hens had lower ND_{10} than the C line hens (16.18 vs 19.25 days).

11. The S line hens had significant ($p \leq 0.05$) higher EN_{120} than C line hens (79.38 vs 74.03 eggs)

12. The S line hens had significant ($p \leq 0.05$) higher EW_{10}, EW_{90} and EW_{120} than the C line (36.54g vs 32.16g, 39.85 vs 35.37 and 40.36 vs 36.42g, respectively). In general, S line had higher values of EW than their C line.

13. In general, S line had higher values of EM than their C line.

14. In general selected line hens had longer CS_{90} or CS_{120} and lower PD_{90} or PD_{120} than the control line (3.42, and 3.12 vs 2.19 and 3.02 and 1.62 and 1.73 vs 2.69 and 2.22, respectively).

15. Realized correlated responses was positive for EN_{120} (5.35 eggs).

16. Selection for increase egg number during the first 90 days of laying caused improving egg weight and egg mass during the first 90 and 120 days of laying were 4.48, and 3.94 g in egg weight and 574.71 and 506.35 g in egg mass, respectively.

17. Positive correlated responses, with CN (1.10 and 1.95), CS (0.51 and 0.10 egg) and PN (1.08 and 2.13) for 90 and 120 days, respectively were recorded however, realized correlated response was negative of PD_{90} and PD_{120} (-1.07 and -0.49 days).

Selection for egg number in the first 90 days in Dandarawi layers affected mainly egg number, egg weight, egg mass and clutch size and pause traits, while egg quality appeared not to be changed. This means that the selection for one generation is not enough to cause variation in these traits. It is advised to continue the direct selection program for egg number during the first 90 days to achieve more improvement in egg production traits. In conclusion, the results of the present study showed that family selection for egg number in the first 90 days of laying would be an effective criterion to make progress for all studied traits except YI.

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