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The Effect of Separate-Sex Rearing of Slaughter Quail on Serum Corticosterone Level

Usama T. Mahmoud[1]*, Mootaz A.M. Abdel-Rahman[1], Madeha H.A. Darwish[1], Gamal M.M. Mosaad[2]

[1]*Department of Animal Hygiene, Faculty of Veterinary Medicine, Assiut University 71526, Assiut, Egypt*
[2]*Department of Animal and Clinical Nutrition, Faculty of Veterinary Medicine, Assiut University 71526, Assiut, Egypt*

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Japanese quails are used widely in biomedical and agricultural research as well as for the production of meat and eggs. Separate-sex rearing is commonly employed in the poultry industry because of differences in growth rates and nutritional requirements of male and female chickens (Mine *et al*., 2002). The separate-sex rearing of growing birds allows achieving a better homogeneity with respect to live weight and high production traits (Mincheva *et al*., 2012).

Gender of quails play a role on fattening performance and body weight of quail. Shrivastava *et al*. (1995) reported that the birds grown as separate had a higher live body weight at 5 weeks of age compared to those grown as mixed. Kul *et al*. (2006) suggested that rearing male and female quails separately can be recommended to the producers for a higher live body weight, body weight gain, and carcass weight.

Corticosteroid concentrations in blood have been used as a measure of environmental stress in birds (Edens and Siegel, 1976; Beuving *et al*., 1989). Corticosterone is of particular interest because it is the primary hormone facilitating stress responses in birds, it is functionally important during maturation and ovulation of ovarian follicles (Etches and Cunningham, 1976). Mature males exhibited higher corticosteroid levels in response to ACTH than mature females (Sheila and Cheryl, 1987)

This study was undertaken to determine the effect of growing males and female Japanese quails separate or mixed together on serum corticosterone level. In order to asses whether this system had a stressful effect on the bird health or not.

This study was carried out from October 2008 to December 2008 at the Faculty of Veterinary Medicine, Assiut University, Egypt. Forty five quail chicks at age of twenty one days were divided into 3 groups according to sex: Females only (15 birds), males only (15 birds) and mixed group (7 males and 8 females).

Twenty blood sample (5 from each group except in the mixed one where 10 blood samples were taken, 5 from females and 5 from males). Blood samples were collected in test tubes without anticoagulant to determine the corticosterone levels. The tubes were kept at the room temperature for 30 minutes then stored at a refrigerator for 60-90 minutes and then centrifuged at 3000 r.p.m for 10 minutes and the separated serum was transferred to another Epindoorf`s tube using micropipette. The serum samples were kept at –20 ºC until analyses for its corticosterone levels using AssayMax corticosterone ELISA kits (obtained from ASSAYPRO, catalog number EC3001-1) following the procedure outlined by manufacturer. The results were expressed as the mean ± SE. All data were analyzed using one way analysis of variances (ANOVA) followed by LSD TEST using SPSS 11.0 statistical software (spss, Inc, Chicago, IL,2001).

The previously mentioned results revealed that, males group had a significantly ($p<0.05$) higher level of serum corticosterone than females group (19.48 and 13.16 ng/ml, respectively) or mixed one (12.09 and 12.99 ng/ml for females and males, respectively). The results disagreed with Remage *et al*. (2003) who reported that, group housed birds which were separated from their pair mates and housed in a same sex group exhibited a non-significant increase in plasma Corticosterone in response

*Corresponding author: Usama T. Mahmoud

E-mail address: usamakomsan5@gmail.com

to separation.

Table 1. Effect of sex separation on serum corticosterone level of quail chicks

Group		Serum corticosterone (ng/ml)
females		13.16^{b}±1.26
males		19.48^{a}±1.31
Mixed	female	12.09^{b}±2.11
	male	12.99^{b}±1.54

^{ab} Means with different superscripts in the same column differ significantly ($p<0.05$).

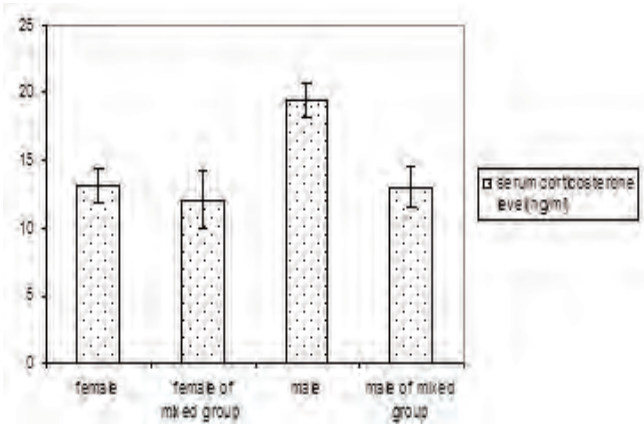

Fig. 1. Effect of sex separation on serum corticosterone level of quail chicks .

The results of the present experiments could be explained as a social frustration that has been shown to elicit hypothalamic-pituitary axis (HPA) activation in mammals (Romero *et al.*, 1995; Lyons *et al*., 2000). It has been established that subordinate male's rats have a reduced serum testosterone and higher corticosterone relative to dominant (Hardy *et al*., 2002). It Could be conlcuded that, when quail used for studying the stress the examined group of birds must include both genders. The lowest serum corticosterone level was for the group which contains both sexes (males and females). Therefore, it is advisable to raise both sexes in the same group. The effect of sex separation as stress factor needs further work

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