

Divergent selection for low and high adrenal response to restraint in Pekin ducks: effects on fear responses

I. ARNAUD^{1,2}, B. BASSO³, M.D. BERNADET⁴, M. COUTY², F. DUBOS⁴, G. GUY⁴, J.M. BRUN³ and D. GUÉMENE^{1,2}

1SYSAAF, URA, Centre de Tours-Nouzilly, 37380 NOUZILLY, FR

2INRA-UR83, URA, Centre de Tours-Nouzilly, 37380 NOUZILLY, FR

3INRA-UR631, SAGA, chemin de Borde Rouge, BP52627, 31326 CASTANET-TOLOSAN cedex, FR

4INRA-UE89, UEFG, Artiguères, 40280 BENQUET, FR.

E-mail: guemene@tours.inra.fr

In poultry, fear responses often have negative consequences on productivity and welfare. The aim of this study was to investigate the effects on fearfulness of a divergent selection on adrenal response to physical restraint. Pekin ducks from INRA37 strain were therefore divergently selected for three generations of high (HCort line) or low (LCort line) corticosterone levels measured after being hanged by feet during 10 min. (200 per line and generation) and ducks were concomitantly submitted to different physiological measures (initial level of corticosterone after capture and maximum response capacity of the adrenal glands) and behavioural fearfulness tests (restraint for 10min., new environment in presence of counterparts or of a human which stand up during 1 min.). Physiological data between lines were compared using the parametric T-test whereas behavioural data were compared using the non-parametric Mann-Whitney test. In the third generation, the HCort line ducks showed a higher adrenal sensitivity to capture and to constraint and have a higher adrenal maximum capacity than the LCort line ducks ($p < 0.001$). Regarding the behavioural aspects in third generation, the HCort ducks showed a significantly higher physical activity than the LCort ones, during the restraint test ($p < 0.001$) as well as during the test in a new environment with counterparts ($p < 0.01$). Interestingly, the HCort line ducks also showed a higher level of social motivation than the LCort ones ($p < 0.001$ in second generation, $p < 0.08$ in third generation). In conclusion, changes in the overall adrenal responsiveness, physical activities in stressful situations and social motivation appeared to be associated to the divergent selection program on the adrenal response to restraint in ducks.

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