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Part VI

XV CONVEGNO SO.FI.VET

GLUCOCORTICOIDS IN HAIR, FECES AND URINE OF FARMED REPRODUCING EUROPEAN BROWN HARES

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Included within minor farmed species, hares started to be farmed by '60s but rearing systems are still not standardized and few information is available on the stress level of animals in captivity. In general, chronically elevated stress levels affect metabolism, immune response, reproduction and/or survival (Boonstra et al., 1998; Sheriff et al., 2009). The present study aimed at measuring corticosterone and cortisol concentrations as stress indicators in hair, feces and urine of farmed reproducing hares in different moment during farming. The pairs were housed in a commercial farm (Venice, Italy), in outside roofed cages (1 m long, 1.60 m wide, 70-80 cm high). Ten pairs at their first reproductive cycle were used: five with dams previously kept in mixed-sex groups and five with dams kept in female groups. Feces, urines and hair of all pairs were collected 1, 7 and 14 days after pair forming, 1 day after partum and after weaning offspring (at 25 d). Feces and urines were collected by a net and a bowl put under the cage 24 hr before sampling while hair was individually collected by gentle pulling hair from the hare back. Corticosterone and cortisol were measured by specific microtitre radioimmunoassays (RIAs) as detailed by Bertotto et al. (2011) upon steroid extraction by diethyl ether (urine and hair) or ethanol (faeces). To validate RIAs, parallelism and intra-assay tests were performed. The data were analyzed by PROC MIXED (SAS, 2013) with sex composition of origin group (mixed-sex or only females), sampling time and their interaction as fixed effects. RIA validation tests showed acceptable parallelism for extracts in all matrices and steroids and the intra-assay coefficients of variation were always below 10%. The sex composition of the origin group had no effect on glucocorticoid levels in various matrices, whereas cortisol (124, 29, 37, 86, 39 ng/g at 1, 7, 14 day post pair forming and in post partum and post weaning, respectively; $P < 0.001$) and corticosterone (86, 54, 59, 69, 78 ng/g at 1, 7, 14 day post pair forming and in post partum and post weaning, respectively; $P < 0.10$) concentrations in feces changed with the sampling time. In the present study, both cortisol and corticosterone concentrations were successfully measured in all matrices. Pair forming resulted as the highest stressful time, but the glucocorticoid decrease in feces after 7 d indicates that the stress occurred for a relatively short period. Feces resulted an optimal non invasive matrix for measuring stress in hares, while hair did not both for the lack of differences in glucocorticoid levels and the invasiveness of sampling.

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Bertotto et al. (2011) *Gen Comp Endocrinol*, 174: 44-50; Boonstra et al. (1998) *Ecol Monographs*, 68: 371-394; Sheriff et al. (2009) *J of Anim Ecol*, 78: 1249-1258.