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Analysis of cortisol in hair samples as an indicator of stress in pigs

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Abstract

Detection of cortisol is one of the most widely used methods to assess stress in animals because it provides information about hypothalamic–pituitary–adrenal axis activity. The most common biological samples are plasma, saliva, urine, faeces, milk and hair. Hair cortisol analysis could be a good non-invasive procedure to detect chronic stress since cortisol is incorporated and stored inside growing hair. The aim of this study was to determine whether cortisol could be detected in pig hair and could serve as a proper chronic stress indicator. Hair samples from two regions (cranio-dorsal (D) and dorso-lumbar (L)) of twenty crossbred entire male pigs were taken at 8, and 22 weeks of age. The pigs were subjected to a weekly remixing procedure. The mean cortisol level for the hair samples was 19.30 ± 0.63 pg/mg (range 6.4-43.88). Hair for second sampled day had higher cortisol values (P=0.002) than hair from first sampled day. Furthermore, L region had higher values than D region at every age measurement (P<0.001). Significant positive correlations were found between first sampled day and second sampled day in both region D (r=0.442 P=0.019) and region L(r=0.523 P<0.001). There were also correlations between both regions for first day (r=0.595 P<0.001) and for second day (r=0.523 P<0.001). Thus, cortisol could be detected in pig hair. However, some methodological improvements and constraints were detected, and further studies are required before recommending its use as a chronic stress indicator.