CORTICOSTERONE LEVELS IN BLOOD AND FEATHERS OF BROILER CHICKENS USING LCMS METHOD AS AN INDICATOR OF ANIMAL WELFARE

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The growing concern of many citizens regarding animal living conditions have highlighted the need for reliable methods to assess the welfare of animals. Increased blood corticosterone (CORT) is a well-accepted indicator of acute stress in poultry. Nevertheless, the process of obtaining blood samples is recognized as a stressful measurement, where CORT levels may be influenced by the procedures of capturing, handling, and blood extraction. Evaluating CORT in feathers has been proposed as a superior matrix for documenting longer-term stress without being affected by handling stress for taking the samples. The objective of this trial was a first step towards validating the corticosterone in feathers by testing a dose-related response to long-term oral administration of corticosterone. Treatments consisted of daily oral administration of six doses of corticosterone concentration (0, 1, 2, 3, 4 and 5 mg/kg) from 1 to 42d-old. A total of 60 one day-old male Ross 308 slow feathering chicks were allocated to six floor pens, with ten broilers per pen. The chickens were considered as experimental unit and blocked in pens with two doses per pen. For example, the first pen consisted of 5 birds from the first treatment (0 mg/kg) and 5 birds from the second treatment (1 mg/kg). Blood and feathers from the back at d14, 28, and 42 and feathers from the wing and tail at d42 were collected for analysis of corticosterone levels using LCMS. R Studio was used for variance analysis, and when significant, the means were compared by a Tukey test at 5% significance. CORT levels in plasma and tail feathers from 42 d-old chickens, increased with increasing levels of corticosterone administered orally ($P<0.05$). CORT levels in dorsal and wing feathers at 42d also increased with increasing levels of CORT administrated orally up to 4mg/kg but did not significantly increase further at 5 mg/Kg ($P<0.05$). Body weight gain (BWG) was impaired by increasing levels of CORT dosage, which may have affected total accumulated dose animals received. There was no correlation between plasma levels and dorsal feathers at age 14d, 28d, and 42d ($P>0.05$). Plasma and feathers levels of CORT are not comparable. Chronic exposure to increasing CORT levels throughout the lifespan of chickens is reflected in the CORT levels in feathers as measured by LCMS. It still needs to be determined whether repeated exposure to short-term increases in CORT levels equally results in elevated feather CORT levels.