

The effects of an ACTH challenge test on lame and non-lame dairy cows

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Chronic lameness is a serious welfare concern due to high prevalence and the pain and stress involved. The phenomenon of „adrenal fatigue” might also be present in animals exposed to long-term stress. The aim of this research was to assess physiological responses to acute stress triggered by ACTH load in cattle suffering from chronic intermittent stress (lameness). Based on locomotion scores (LS), we selected 11 chronically lame (LS: 3-5) and 11 non-lame (control, LS:1-2) animals (lactation number: 4.1 ± 1.0 vs. 4.3 ± 1.6 ; DIM: 190 ± 78 vs. 167 ± 73 , milk yield: 31.8 ± 3.6 vs. 32.1 ± 7.0). Blood samples were taken for cortisol assay 30, 15 and 0 minutes prior to and 10, 20, 30, 40, 60, 120 and 240 minutes after administering 60 μ g synthetic ACTH (tetracosactide, Synacthen inj.). Heart rate variability (HRV) of each animal was also recorded by Polar heart rate monitors. Hair was also sampled for cortisol assay prior to ACTH challenge. Higher cortisol concentrations in hair (10.2 ± 2.5 vs. 7.8 ± 2.2 ; p Chronic intermittent stress caused by lameness had an influence on the HF component of HRV, but did not affect the responsiveness of the adrenal cortex. Authors are grateful for the following grants. VJ.: János Bolyai Research Scholarship (BO/29/16/4); EL.: New National Excellence Program (ÚNKP-17-2-I-ÁTE-4); LK.: János Bolyai Research Scholarship (BO/40/16/4), New National Excellence Program (ÚNKP-17-4-I/SZIE-7), OTKA Postdoctoral Scholarship (NFKIH-6493-1/2016). The research was supported by the EU and co-financed by the European Social Fund (EFOP-3.6.1-16-2016-00024).

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