Heart rate measures in goats affected by small ruminant lentivirus (SRLV): a pilot study

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Small ruminants lentivirus (SRLV) provokes caprine arthritis-encephalitis (CAE) which manifests with joint and udder soreness and, at final stages, emaciation and death. However, the illness can develop sub-clinically for several years, provoking no obvious symptoms. It is not known if affected goats without clinical symptoms of CAE do not experience pain when milked. Twenty dairy goats (10 infection-free, 10 SRLV-positive), without clinical symptoms of CAE, were subjected to daily milking. Heart rate (HR) was measured with HR monitor (Polar 810i, Finland) 10 minutes before (Phase 1), during (Phase 2) and after (Phase 3) morning and evening milking. HR files were corrected with moderate error correction filter in Polar Pro-trainer software. Only files containing less than 10% of errors were retained for the analysis, due to higher than recommended number of artefacts, HRV analysis was omitted. Mean HR and HRmax were submitted to multi-factorial ANOVA with random animal effect. The models included goat's health status (healthy vs infected), time of day (morning vs evening), phase (Phases 1 – 3) and their interactions as fixed effects. HR measures did not differ between healthy and infected goats ($P>0.05$ for both HR and HRmax). Milking increased the HR (Phase 1, LSM=114.2±2.88 bpm vs Phase 2, LSM=124.3±2.88 bpm; $P=0.01$ and Phase 2 vs Phase 3, LSM=117.7±2.88 bpm; $P<0.01$) and HRmax (Phase 1, LSM=134.5±3.85 bpm vs Phase 2, LSM=153.8±3.85 bpm; $P<0.01$ and Phase 2 vs Phase 3, LSM=139.2±3.85 bpm; $P<0.01$). Also, during evening milking both cardiac measures were higher than during morning milking (HR, morning, LSM=111.7±2.69 vs evening, LSM=125.8±3.04, $P<0.01$; HRmax, morning, LSM=138.6±3.48 vs evening, LSM=146.4±4.08, $P=0.04$) which can be explained by greater relaxation of goats in morning hours. Although health status was not detectable, other effects (e.g. husbandry procedures), resulting in emotional or locomotor responses could be monitored by HR measurement for welfare assessment in goats. All procedures were accepted by the Commission for Ethics in Animal Experimentation.