
PAIN ASSESSMENT IN CALVES UNDERGOING RING CASTRATION

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The rubber ring method for the castration of calves is quick, easy, cheap and reliable, but there are several studies indicating that it causes significant pain during and after the procedure [1]. The aim of this study was to evaluate the impact of the ring castration of 2-month-old calves on potential indicators of pain or stress. These indicators included serum cortisol concentration, leukogram, behavioural posture and activity evaluated using the UNESP-Botucatu unidimensional composite pain scale [2], local temperatures and scrotal clinical evaluation. Moreover we used the in-field measurement of Leucocyte Coping Capacity (LCC) on whole blood as a different method to evaluate suffering condition [3]. Twenty healthy calves (90 ± 4 kg of body weight, 2 months of age) were selected for the study and randomly assigned to either sham (n=10) or ring castration (n=10). Calves were handled in a similar manner for analogous amount of time and castrated with rubber rings using an elastrator or not castrated. Behavioural assessment, blood sampling, temperature recording and scrotal evaluation were repeated 1 hour before castration, 30 minutes after ring application and at day 3, 7 and 14 after ring application. The same timepoints were used in the sham group. Chronological changes of cortisol, leukogram, pain scale score, local temperature and LCC were analysed within each group and between groups using the SAS statistical software. $P < 0.05$ was considered significant. After the ring application, the scrotal sac appeared swollen at day 3, mummified and partially detached at day 7 and at day 10 it was surgically removed. Pain scale score showed very little pain in castrated animals at any timepoints (mean score range 0,3-0,6 out of 10) and no pain in sham calves (0 out of 10). No significant differences were recorded between sham and castrated animals among timepoints in pain scores, cortisol concentrations and leukograms. LCC decreased significantly in castrated animals at day 7 compared to baseline values, thus indicating an increase in stress level. A significant difference between groups was observed in LCC values 7 days after ring application (<0.0001). Pain indicators such as serum cortisol, behavioural observation, scrotal temperature and clinical evaluation were unaffected after ring castration. Since LCC presented a significant variation, we considered that this method might represent a more sensitive tool in case of procedures that cause mild pain.

[1] Marti et al. Effect of band and knife castration of beef calves on welfare indicators of pain at three relevant industry age. *Journal of Animal Science*, 95:4367-4380, 2017. [2] de Oliveira et al. Validation of the unesp-botucatu unidimensional composite pain scale for assessing postoperative pain in cattle. *BMC Veterinary Research* 10:200, 2014. [3] McLaren et al. Leucocyte Coping Capacity: a novel technique for measuring the stress response in vertebrates. *Experimental Physiology* 88:541, 2003