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Aversion to the inhalation of nitrogen and carbon dioxide mixtures compared to high concentrations of carbon dioxide for stunning rabbits

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Abstract

*Stunning by inhalation of nitrogen (N_2) and carbon dioxide (CO_2) mixtures reduces aversion compared to high concentrations of CO_2 in pigs and poultry. The objective of the study was to assess the aversion to 90% of CO_2 (90C) and an alternative gas mixture of 80% N_2 and 20% CO_2 (80N20C) in commercial rabbits (*Oryctolagus cuniculus*). Sixty animals, divided into two groups, were used. During the first day, the rabbits of both groups were lowered in pairs into the pit with atmospheric air and their behaviour was recorded as control. During the second day, one group was exposed, again in pairs, to 90C and the other to 80N20C for 1 min. Exploratory behaviour and general activity were assessed 2 min before the exposure, during the exposure and for 2 min subsequently. During the exposure, signs of respiratory distress, loss of balance, muscle twitching and recovery of balance were also assessed. In the control sessions (atmospheric air), animals did not show respiratory distress or muscle twitching and were less active while the crate was descending than when gas treatments were applied. The percentage of animals with respiratory distress was higher in 90C (97%) than 80N20C (40%). Muscle twitching occurred earlier in 80N20C (97%; 23.9 s) than in 90C (17%; 37.4 s). A second phase of muscle twitching occurred only in 90C at 93.0 s. Mean latency of lost of balance and recovery were lower in 80N20C (24.2 and 98.6 s, respectively) than in 90C (28.2 and 110.2 s, respectively). It is concluded that rabbits showed less signs of respiratory distress to inhalation of 80N20C than 90C but more signs of aversion than when they were exposed to atmospheric air.*

Keywords: *animal welfare, aversion, carbon dioxide, nitrogen, rabbits, stunning*