Handling of Laboratory Rats

Impact of Handling Method and Duration on the Behaviour and Weight Development of Rats

G. Cramer, P.-P. Tsai, H. D. Stelzer, H. Hack Barth
Institute of Animal Welfare and Behaviour (Pets, Laboratory Animals and Horses), University of Veterinary Medicine Hannover, Germany

INTRODUCTION

Within the development of laboratory animal science, increasing attention has been given to the possible influence of handling as an elictor of distress. Different methods of lifting and fixing rats have been established in laboratories. The aim of this study is to investigate the impact of nature and duration of manual contact on the behaviour and physiological parameters of rats.

ANIMALS, MATERIAL AND METHODS

DA rats were chosen due to particular fearfulness (Mechan 2001). 15 male and 17 female DA/ZTM rats of three weeks of age were divided into 4 groups of 8 animals. Temperature-sensitive microchips (IPTT-100, Fa. Plexx, The Netherlands) were implanted into the abdominal cavities of the rats.

Animals of Group “G5” and “G1” were gently stroked for five (G5) or one minutes (G1) each (Figure 1), Group S was tail-lifted without any further contact to humans (Figure 2), Group K acted as a control group, which was lifted by grabbing the chest without any further contact as well (Figure 3). All animals were handled twice a week.

One minute prior to and following the handling procedure, body temperature was measured with a sensor-notebook-system (DAS 5002, Fa. Plexx, The Netherlands, Figure 4). Body weights were measured before animal were put into fresh bedding.

After five weeks, a double blind test was performed by experienced and inexperienced personnel. As movement, noise and defecation were concerned as signs of aggression and fear, those behaviours of all rats during lifting, grabbing and fixing were observed.

At the end of the experiment, all animals were sacrificed by CO₂-Euthanasia for other measurements.

RESULTS

Figure 5 visualizes evidence of aggression in the evaluation of behaviour. On a scale of 1-5 with 1 meaning “no signs of aggression”, and 5 “very aggressive”. The rank of aggression of inexperienced personnel was significantly higher than of experienced personnel (p=0.0155). The experienced personnel ranked male rats as similar aggressive as females, whereas inexperienced personnel evaluated female rats as more aggressive (p=0.0418).

Body weight gain was compared at the end of the experiment (Figure 6). A significant difference (p=0.0320) was found between groups, due to the difference between G1 and K group (p=0.0780) and the difference between G1 and S group (p=0.0661). It should be mentioned that for both genders tail-lifting groups had less weight gain than others and that female G1 rats gained much more weight than other female groups, while G5 male rats showed more body weight gain than other males.

CONCLUSION

The presented data indicated that the handling procedures can affect the response of the animals, including the physiological parameter and behaviour and that the reactions of males and females are different.

Moreover rats reacted differently to experienced and in experienced personnel. It demonstrated that an appropriate education of the people, who are involved with animals such as animal caretakers, technicians, veterinarians and students, is necessary.

Further research to determined more information about the influences of handling is still needed.