

Ethograms for Equitation Science

the use of structural behavioural definitions to study social interactions and selection tests and to develop a reference ethogram for domestic horses

Summary

Equitation science is the scientific discipline that studies the interactions between horses and humans, aiming to improve horse welfare by facilitating more evidence-based practices in horse training and management. As an applied discipline, equitation science overlaps with many existing disciplines, applying their methods to the study of human-horse relations. Applied ethology is one of the main disciplines that contributes to the development of equitation science. Valid and reliable knowledge of the behaviour of domestic horses is fundamental for studies on interactions of horses with humans and for applications that are efficient, safe and horse friendly. The goal of this PhD project was to start a process towards a more standardised use of ethograms in equitation science. Ethograms, basically an inventory of behavioural units, are crucial for all studies or applications of applied ethology.

Behavioural patterns are the measuring units of applied ethology of any organism, including horses. However, there are no generally accepted rules or guidelines for ethograms or for the definition and classification of their behavioural units. Because topics in (applied) ethology are spread over multiple levels of complexity, flexible use of ethograms is necessary. Still, a general reference ethogram for horses would benefit comparability and reproducibility of studies, by providing a starting point for individual study ethograms. Sample sizes of studies in equitation science are often limited for practical and financial reasons, but more compatible studies would facilitate meta-analyses.

The goal of many studies in equitation science is to measure how horses experience certain management or training practices on an emotional and cognitive level, aiming to evaluate their welfare implications. These types of studies apply functional definitions or classifications of behaviours, meaning they are characterised by the consequences or the effects of the behaviours on the horses' environment, including themselves, other organisms or objects. However, before we can reliably distinguish why horses perform certain behaviours, we need to agree on what exactly it is that they do. The need for description before experimentation on function or causes, has been emphasised since the early days of ethology. This research project set out to write a first version of a descriptive reference ethogram for domestic horses that could be the first step towards agreement on how to name and describe equine behaviour patterns.

In preparation of the actual writing of a reference ethogram, three studies were performed that included developing specific study ethograms. The first one was a study on agonistic and affiliative interactions within a particular group of group housed horses, evaluating the influence of fluctuating group composition and variable stocking density. Social contact has

been shown to have a beneficial effect on the health and welfare of domestic horses, but many horse owners still fear aggression and injuries when horses are housed together. In this particular group, social interactions were not affected by age or density. There was no significant correlation between agonistic and affiliative interactions and no significant effect of affiliative interactions on agonistic behaviour, but agonistic interactions had a significant linear and quadratic effect on affiliative interactions. When comparing horses based on relative aggressiveness, the analyses showed that these horses were, on average, 3.7 times more aggressive towards less aggressive horses than to more aggressive horses.

Two other studies focused on the development of custom-made behavioural selection tests for police horses. This was done in collaboration with the mounted section of the Belgian federal police, using their horses and installations. The first phase of this ongoing research project established that the proposed program of personality tests was feasible and safe. Testing of 48 active police horses allowed to form a preliminary reference population for comparison of new horses. An attempt to discriminate between the most suited and the suboptimal horses in the test sample, did not produce many variables with significant differences. However, this could be very different for other horses as those police horses were rigorously selected on temperament and extensively trained to remain calm in stressful situations.

The second phase of the research on the police horses focused on the effect of the activity in the last 30min prior to the personality tests on the behaviour during a shorter version of the original test program. Using a cross-over design with 3 groups of 10 horses each, three different preceding activities were tested for all horses, with a different order of preceding activities for each group. The results showed a significant effect of preceding activity on the majority of variables in the arena test, but not on any variable of the other parts of the test program. Effects of multiple testing were limited and dispersed over the four major parts of the test program.

The experience of these three studies and the reviewing of existing literature on definitions of equine behaviour, allowed to write a first version of a descriptive reference ethogram. A part of it was tested by asking an expert panel of researchers and practitioners to apply it on 30 short video clips. Statistical analysis showed they did this with high reliability and without significant differences between researchers and practitioners. The current version of the reference ethogram will need further development and testing before it could be considered as a widely utilised instrument by equitation scientists and practitioners.