



## Aversiveness of husbandry procedures for pre-weaned foals: A comparison using behavioural and physiological indices



Aleksandra Górecka-Bruzda<sup>a,\*</sup>, Zbigniew Jaworski<sup>b</sup>, Mira Suwała<sup>a</sup>,  
Magdalena Sobczyńska<sup>a</sup>, Ewa Jastrzębska<sup>b</sup>, Magdalena Ogłuszka<sup>a</sup>, Carol Sankey<sup>c</sup>,  
Marlena Boroń<sup>d</sup>, Tadeusz Jezierski<sup>a</sup>

<sup>a</sup> Institute of Genetics and Animal Breeding, Polish Academy of Sciences, Postępu 36A, 05-552 Jastrzębiec, Poland

<sup>b</sup> University of Warmia and Mazury, Faculty of Animal Bioengineering, Oczapowskiego 5, 10-719 Olsztyn, Poland

<sup>c</sup> University of Paris Descartes, Institute of Psychology, 71 Avenue Edouard Vaillant, 92774 Boulogne-Billancourt, France

<sup>d</sup> Research Station of Ecological Agriculture and Preservation Animal Breeding, Polish Academy of Sciences, Popielno, 12-220 Ruciane-Nida, Poland

### ARTICLE INFO

#### Article history:

Received 16 September 2016

Received in revised form 2 February 2017

Accepted 5 February 2017

Available online 14 February 2017

#### Keywords:

Aversiveness

Husbandry

Human-animal relationship

HRV

Salivary cortisol

Konik polski horse

### ABSTRACT

Husbandry procedures are necessary for different purposes in horse breeding. The aim of the present study was to assess the aversiveness and effects on the horse-human relationship of a range of common husbandry procedures, in pre-weaned non-habituated Konik polski foals. Our measures included commonly and previously validated behavioural and physiological measures of stress, as well as behavioural responses to an approaching human. Twenty-seven foals (11 colts and 16 fillies) were submitted to four husbandry procedures: hoof trimming, microchip implantation, blood sampling and body conformation measurements. Avoidance behaviours (head shaking, body jerks, withdrawals and stepping, AB), heart rate (HR), maximum heart rate (HRmax), square root of the mean of the sum of squares of differences between adjacent interbeats intervals (RMSSD), low-frequency power to high-frequency power ratio (LF/HF ratio) and salivary cortisol responses were compared between procedures. Moreover, reactivity to a passive and active human (latency to approach a human; flight distance on human approach, probability of touching the horse and probability of flight) was assessed before and after application of procedures. All procedures provoked avoidance behaviours during treatments, as well as an increase in all physiological indices as compared to pre-treatment levels. During treatments, the highest values of HR and HRmax were recorded for hoof trimming. Overall, increase in cortisol levels was greater in fillies ( $199.0 \pm 325.6$  pg/ml) than in colts ( $139.5 \pm 215.1$  pg/ml,  $P < 0.01$ ). However, cortisol concentration was higher after the procedure than it was before for hoof trimming ( $P < 0.01$ ) and blood sampling ( $P < 0.05$ ).

There was no difference between procedures regarding AB, nor regarding cortisol concentration increase. There was no difference in behaviour towards a human following the procedures as compared to pre-procedural measures.

Although eliciting avoidance behaviour and inducing an activation of some physiological stress indicators, these effects were transient (no HR elevation and no alteration of the perception of humans after the procedure) and the procedures conducted routinely by experienced handlers did not cause sensitisation for subsequent procedures.

© 2017 Elsevier B.V. All rights reserved.

### 1. Introduction

Increasing public awareness of animal welfare stimulates improvement of husbandry conditions in animal production, including horses. Public debate, involving animal protection organ-

isations and non-professionals, focuses mainly on behavioural symptoms of discomfort in farm animals. Sometimes, however, behavioural symptoms of distress or fear can be elicited by husbandry practices, which are necessary to preserve the animals' health and welfare. For instance, young horses may display vigorous defence reactions during hoof trimming, which may lead us to regard this procedure as cruel and abusive of their welfare. However, neglecting hoof care may lead, in the long term, to inappropriate leg posture and lameness.

\* Corresponding author.

E-mail address: [a.gorecka@ighz.pl](mailto:a.gorecka@ighz.pl) (A. Górecka-Bruzda).

Although appropriate rearing of foals and young horses is crucial for their future use, it is rarely addressed in animal science. Numerous studies have been carried out to investigate the role of stabling and social aspects of housing on the welfare of young horses (e.g. Christensen et al., 2002; Søndergaard and Ladewig, 2004; Harewood and McGowan, 2005; Visser et al., 2008). Studies on foals mainly focused on the issue of weaning (McCall et al., 1985; McCall et al., 1987; Hoffman et al., 1995; Heleski et al., 2002; Moons et al., 2005; Henry et al., 2012; Górecka-Bruzda et al., 2015). However, pre-weaned foals also have to undergo different husbandry procedures that can be a source of discomfort. Welfare aspects of procedures such as hoof care, blood sampling or body conformation measurements have not been sufficiently studied. To our knowledge, only one paper dealing with stress caused by microchip implantation in very young foals (Erber et al., 2012) can be found in the available scientific literature.

Husbandry procedures are necessary for different reasons. Trimming hooves ensures appropriate leg posture and hooves health. Although not painful, trimming hooves requires restraining the foal for a relatively long time and may induce discomfort. Similarly, blood sampling may be perceived as stressful since it involves puncture of the skin, underlying layers and vein wall. This stimulates nociceptors, responsible for the sensation of pain and usually provokes defence reactions from a horse (McDonnell 2000). However, blood sampling is necessary for compulsory parentage confirmation according to studbooks requirements. It is also necessary in different veterinary interventions and is therefore an inevitable procedure, even for very young foals.

Microchip transponder implantation is mandatory in Europe for breeding purposes and epidemiological control of horses, according to the animal identification law (COMMISSION REGULATION (EC) No 504/2008). The transponder should be injected into a nuchal ligament of the horse. This involves the insertion of a needle of about 2.6 mm in diameter into a structure harder than a skin or muscle. This procedure is hypothetically more painful than subcutaneous or intramuscular injections or blood sampling.

Lastly, body conformation measurements are used to monitor physical development in youngstock. Conformation measurements require transient separation of a foal from its dam, manipulations around the animal's legs and chest and immobilisation of the foal on a hard, even surface to ensure high measurement accuracy.

Aversiveness of most husbandry procedure for foals is mainly related to restraint. Foals are usually restrained by a handler holding the head collar or placing his arm around the animal's chest (Erber et al., 2013). For the horse, movement restriction itself can be stressful (Vitale et al., 2013) and if not habituated, a foal may avoid being touched. In fact, restraint is probably part of the reason most husbandry procedures are particularly aversive for young horses (Sankey et al., 2010). In practice, handling procedures are usually done in a rapid and sometimes harsh way. A negative experience of human handling may have long-term effects, including constant avoidance of humans, fearfulness and aggression (Hausberger et al., 2008). Frightening and/or painful experiences may elicit escape or defence reactions in animals. Obviously, reducing fear of humans and improving acceptance of human handling is necessary for future use, as well as appropriate life-long care and handling of horses. Horses may easily develop strong resistance to veterinary treatments (McDonnell, 2000). Measuring the potential long-lasting distress related to these treatments in pre-weaned foals would be important to evaluate the extent of discomfort and to improve horse welfare.

The aim of the present study was to assess the level of aversiveness of selected husbandry procedures, routinely applied to pre-weaned Konik polski foals, by measuring the intensity of behavioural and physiological reactions. Behavioural responses were measured by the frequency of avoidance behaviours (AB)

and for physiological reactions, heart rate (HR), heart rate variability (HRV) and salivary cortisol concentrations were recorded, as well established non-invasive stress parameters in equine studies (e.g. Schmidt et al., 2010a,b; Erber et al., 2012; Yarnell et al., 2013). General reactivity to humans was assessed with passive and active human tests, carried out before and after application of all procedures.

## 2. Material and methods

All procedures were accepted by the 3rd Local Commission for Ethics in Animal Experimentation, Warsaw, Poland. No other than routine husbandry procedures in horse production were applied. During all procedures, handlers behaved as they routinely did, i.e. approaching, touching or speaking to the animals.

### 2.1. Animals

Twenty-seven Konik polski foals, born in 2010 and 2011 (pooled, 11 colts and 16 fillies) at the Research Station of Polish Academy of Sciences, located in north eastern Poland, were used in the study.

Foals were born in their dams' boxes and reared in a traditional manner. They were turned out daily with mares onto a paddock or pasture, depending on their age and on weather conditions, from one to several hours. Apart from pasturing, they received supplementary feed including hay and oats. Foals were subjected to daily contacts with caretakers during feeding, displacing and watering. Since the Station is located in a tourist region, horses were familiar with humans and were used to occasional petting. At the age of about six months, foals underwent the studied husbandry procedures.

### 2.2. Scheme of husbandry and pre-treatment procedures

Procedures were conducted according to on-farm routines for young horses. Procedures were applied in the following order: hooves trimming, electronic transponders (microchips) implantation, blood sampling, and body conformation measurements. For technical reasons, trimming was conducted three weeks before blood sampling, transponders' implantation, and conformation measurements; the last three procedures were conducted on three consecutive days. All procedures took place in the mornings between 8.00 a.m. and 12.00 to minimize the effect the diurnal variations of HRV (Kuwahara et al., 1996) and cortisol (Irvine and Alexander 1994; Erber et al., 2012). In order to habituate foals to the equipment, they were equipped with heart rate monitor (POLAR s810i) on moistened chest area, as recommended by the producer ([https://www.youtube.com/watch?v=3kSf3UF9p\\_M](https://www.youtube.com/watch?v=3kSf3UF9p_M)), fifteen minutes before the procedure. The electrodes were protected by an elastic girth. There were no behavioural reactions to the fitting of HR monitors, except for a slight interest of foals for the device (looking at it, occasionally nibbling it). HR was measured in R-R mode. Subsequently, saliva samples (CORT1) were gently taken with pean forceps on the Salivette® (Sarstedt) tampons. All pre-procedural manipulations were done in the home box without separating the foal from the dam. Then, the experimenter left the box and the foal was left alone with its dam at least five minutes before each procedure.

#### 2.2.1. Hoof trimming

Fifteen minutes after pre-treatment procedures, hoof trimming started with the approach of a familiar handler, who switched on the HR monitor. From this point on, all manipulations in all procedures were defined as treatments. Then, mare and foal were led out of the box into a familiar area in the same building. When both mare and foal were tied close to each other, the first handler held

Download English Version:

<https://daneshyari.com/en/article/5763419>

Download Persian Version:

<https://daneshyari.com/article/5763419>

[Daneshyari.com](https://daneshyari.com)