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Are results of Crib Opening Test connected with efficacy of training horses in a round-pen?

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ABSTRACT

Training the horse is based on human–horse relationship, which requires that the horse shows active, conscious behaviour as well as an ability to learn. It was hypothesized that the horse's learning skill to open the crib is correlated with the effectiveness of training. The aim of the study was to find out whether there is a relationship between the time needed for a naïve horse to open the crib and to accomplish first saddling and mounting. 120 horses were examined: 40 Thoroughbreds (TB), 40 Purebred Arabians (PA), and 40 halfbred Angloarabians (AA). There were 20 colts and 20 fillies in each breed group. The times needed by the horse to open the crib (Crib Opening Test) were assumed as a measure of an aspect of learning skill. The effectiveness of the initial training of the horse was evaluated by the times needed to first saddling and mounting the naïve horse (Saddling Test and Mounting Test) as well as by heart rate (HR) and heart rate variability (HRV) in Saddling Test and Mounting Test. Horse behaviour during the tests was assessed.

It took the TB horses significantly longer to open the crib than it took the AA horses (306 s vs 191 s, respectively). Numerous statistically significant correlations were found between the results of Crib Opening Test and the results of Saddling Test performed by the TB fillies and AA horses: positive with HR, and negative with some HRV parameters. Correlations between the results of Crib Opening Test and Mounting Test were negative with HR and positive with beat-to-beat time (RR) for the PA and AA fillies. It seems that the horses which quickly succeed in Crib Opening Test are calm during the first phase of the initial training until saddling, but they do not willingly accept mounting. However, the relationship between the time of opening the crib and response to the training should be analysed separately in particular horse breeds and sexes.

1. Introduction

The effectiveness of training naïve horses depends on several factors including the horse's attitude toward being trained, human behavior, and external circumstances. The human–horse interactions during training involve the use of body language. Trainers analyse the natural behaviour of the horse and accordingly adjust the course of training to horse reaction. Trainers also use their own visual cues and postures when communicating their intention to the horse (Visser et al., 2009). Therefore, the horse's attention should be focused on the trainer. The horse tries to accomplish the task, in response to the trainer's behaviour (Proops and McComb, 2010; Krueger et al., 2011). However, various training methods use different techniques of

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human-horse communication, and the technics cause differentiated response of the horse to the training. Horses trained using natural methods (also termed sympathetic methods) are calmer and need less time to perform a task in comparison with those trained traditionally (Fureix et al., 2009; Visser et al., 2009; Kędzierski et al., 2012). Since horses are able to respond only to those human pointing gestures which have a stimulating or local enhancement effect (Maros et al., 2008), natural trainers work in close proximity to the horse, inside a round-pen. A training schedule is applied individually for particular horses and adjusted according to the progress achieved (Visser et al., 2009). This human–horse relationship requires that the horse shows active, conscious behaviour as well as an ability to learn.

It is known that individual horses differ in their learning ability and ability to memorise (Wolff and Hausberger, 1996; Lindberg et al., 1999). Individual learning abilities in horses are generally consistent over a time, especially when aversive stimuli are used (Visser et al., 2003). Therefore, it appears that the ability to learn depends on stable individual characteristics (Wolff and Hausberger, 1996; Visser et al., 2003). The learning ability seems to be related to the horse breed rather than to age or sex (Wolff and Hausberger, 1996; Lindberg et al., 1999). Lesimple et al. (2012) showed that individual task-solving skills by horses correlated negatively with the interest shown by the horses towards humans. To the best of our knowledge, the influence of the horse's learning ability on the course and effectiveness of natural training is still unknown.

One way that a horse's learning ability can be established is by the chest opening test (Wolff and Hausberger, 1996; Lindberg et al., 1999; Lesimple et al., 2012). This simple method was successfully used in previous studies concerning the horse's learning performance (Hausberger et al., 2007; Lesimple et al., 2012). Those studies as well as other similar investigations were done on the assumption that performance in one type of test is indicative of general learning abilities (Wolff and Hausberger, 1996; Visser et al., 2003; Hausberger et al., 2007).

The training effectiveness could be measured by the time needed to perform certain tasks as well as by the evaluation of the horse emotional response to the training (Kędzierski et al., 2014). Heart rate (HR) and heart rate variability (HRV) were successfully used to determine the emotional status of trained horses (Visser et al., 2009; Schmidt et al., 2010a; Janczarek and Kędzierski, 2011; Kędzierski et al., 2012; Janczarek et al., 2013a). The heart rate variability (i.e. short-term fluctuations in heart rate), reflects the predominance of sympathetic or parasympathetic (vagal) nervous system activity and is used as an indicator for the stress response of the autonomic nervous system (Schmidt et al., 2010a, 2010b, 2010c, 2010d). The power spectrum of HRV includes some parameters especially useful for assessment of mental stress in horses (Matsuura et al., 2010; Schmidt et al., 2010a, 2010b, 2010c, 2010d). Increased values of beat-to-beat times (RR), standard deviation of RR (SDRR), and the high-frequency component of power spectrum (HF) reflect a shift towards parasympathetic (vagal) activity of the autonomic nervous system. Decreased values of these parameters indicate a shift towards sympathetic predominance (Rietmann et al., 2004; Schmidt et al., 2010a, 2010b). Low frequency component of power spectrum (LF) are mainly attributable to the sympathetic activity (Schmidt et al., 2010a, 2010b, 2010c, 2010d). Thus, the LF/HF ratio is an indicator of the sympatho-vagal balance (Rietmann et al., 2004; Matsuura et al., 2010).

The knowledge of learning skill of a trained horse can be useful for a trainer. It was hypothesized that performing the test of opening the crib, will be useful to evaluate horse training skills. The aim of the study was to find out whether there is a relationship between the time needed for a naïve horse to open the crib and to accomplish first saddling and mounting in a round-pen. The emotional arousal of the horse during the tests (evaluated with the use of HR and HRV) and horse behaviour were also considered determinants.

2. Materials and methods

2.1. Horses

In the study, 120 horses were examined: 40 Thoroughbreds (TB), 40 Purebred Arabians (PA), and 40 halfbred Angloarabians (AA). There were 20 colts and 20 fillies in each breed group. Horses of the three breeds were routinely reared in a similar way. All the horses studied were intended for racing. The Polish horse racing rules take into consideration different rates of particular horse breed growth and development. For this reason, the TBs were to be moved to a race track as two-year-olds, whereas PAs and AAs as three-year-olds. It was at those ages, and just before going to the track, that the horses took part in the experiment. The horses studied did not show clinical symptoms of any illness nor did the fillies show external symptoms of estrus.

2.2. Horse management prior to the experiment

The experiment was conducted on the same stud farm where the horses had been raised. Before, the horses were routinely handled, pastured in sex-segregated groups during the day and not trained. The horses, which had been prepared for presentation shows, were not included in the study. In autumn, the horses were put into individual boxes, a day before the start of the experiment. At first, the learning ability of the horses was tested and afterwards, the saddle training susceptibility was tested.

2.3. Crib opening test

The task in Crib Opening Test consisted of opening a crib with a wooden lid (W-117983 and W-120426 Utility Models) in order to find food. The perimeter of the lid was slightly higher than the perimeter of the crib so that a horse using its muzzle, could lift the lid and then lean the lid on its head. The food used in the study was oats provided on the farms as a concentrate, hence the horses knew the sound of the oats being poured as well as the smell and taste. The test was performed a maximum of one hour before feeding so that the horse expected the concentrate. At the beginning,