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Emotional Response to Novelty and to Expectation of Novelty in Young Race Horses

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ABSTRACT

The aim of this study was to estimate the emotional response to novelty and to expectation of novelty in young race horses. The novelty in this study was the first training on an automated horse walker at a new training center. To estimate the level of emotionality in horses, the telemetric measurement of heart rate (HR) was used. A hypothesis was developed that expectation of novelty can be as exciting for horses as a novelty test. In this study, 40 horses were studied just before and then during their first walk on an automated horse walker. They were divided into four groups, with 10 horses in each group. These groups were as follows: (1) 1.5-year-old Thoroughbred colts, (2) 1.5-year-old Thoroughbred fillies, (3) 2.5-year-old Purebred Arabian colts, and (4) 2.5-year-old Purebred Arabian fillies. HR was measured at rest before exercise, during handling and moving the horse from the stable, while walking on the automated horse walker for about 20 minutes, while moving the horse from the walker to the stable, and at rest after exercise. HR response to the anticipation of novelty was higher in colts than in fillies, particularly in the group of Thoroughbreds.

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1. Introduction

According to a common horse-breeding routine, young warm-blooded horses are brought from their mother stud farms to a training center. At the very beginning of race training, the horses are not submitted to intense exercise. Instead, this time is needed to familiarize the young horses to new objects and situations. When training begins, the novelty for a horse can be a transient social isolation, contact with other unfamiliar horses and with a new appliance like the automated horse walker, or work on a lunge or under the lead of a handler. It is known that exposing a horse to novel stimuli results in the increase in heart rate (HR) [1–4]. Social isolation has also been shown

to cause an increase in HR in horses [5,6]. A common technique which is used to estimate HR in horses is by telemetric measurement [5,7,8]. Moreover, HR of horses is a sensitive indicator of their emotional status [7,9]. On the basis of HR monitoring, an emotional response in horses was recorded before the start of a competition as a result of expectation of future exercise and stress [10]. It was also reported that a small change in the test, such as the presence or absence of a handler, could modify HR in horses [11]. Moreover, when the person leading or riding a horse was nervous, the increase in HR was recorded in both the rider and the horse [12].

The monitoring of the initial phase of training is very important in a horse training routine. First experiences are really significant for horses which are a species endowed with good, long-term memory [13]. Good memory in equines is the reason that the individual experience of a horse has long-term consequences and leads to the formation of an emotional relationship to the horse's environment [13–15].

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Breed, age, and gender of horses can also be important factors influencing their emotional reactions [16,17]. The results of the study by Lloyd et al. [18] identified anxiousness and excitability as the most breed-related components of a horse's personality. The problem of the relationship between gender or breed and the physiological reaction to mental stress in race horses is especially worth noting. Mares and stallions often take part in the same races, regardless of gender. Purebred Arabian and Thoroughbred horses are involved in a similar training routine on a race-track, but they are different from the genetic point of view. In earlier studies, breed-related differences between the two breeds were found in sympathoadrenal and parasympathetic axis regulation in response to exercise [19,20].

The aim of this study was to estimate the emotional response to novelty and to expectation of the unknown in young Purebred Arabian and Thoroughbred colts and fillies. The novel situation in this study was the first walk on an automated horse walker at a new training center. Using an automated horse walker is a basic method applied during the training routine [21]. The hypothesis was developed that expectation of novelty can be as exciting for horses as a novelty test.

2. Materials and Methods

2.1. Horses

This study was part of a larger project designed to investigate the effect of the training-related mental stress of horses. The 40 horses studied were divided into four groups, with 10 horses in each group. These groups were as follows: (1) 1.5-year-old Thoroughbred colts, (2) 1.5-year-old Thoroughbred fillies, (3) 2.5-year-old Purebred Arabian colts, and (4) 2.5-year-old Purebred Arabian fillies. All the horses studied were brought to one of the training centers in Poland. They had been brought to this training center from their mother stud farms 3 days earlier. The Purebred Arabian horses came in groups of seven, six, four, and three, and Thoroughbred horses in groups of eight, six, and six from seven different professional horse breeding stud farms. At the home stud farms, the Purebred Arabian colts had been kept in single horse stalls in separate male stables for about 1.5 years. The other horses had been kept in stalls for about 6 months. They had also been pastured in gender-segregated groups. All horses had been conditioned to being handled, to being led on a rope by their caretaker, and to being moved under the lead of a handler. However, none of the horses studied had been previously trained on an automated horse walker.

2.2. Housing and Caring for the Horses

At the new training center, the horses from each studied group were kept in four different stables. Six to 10 older horses (not included in the study) of the same breed and gender were kept in the same stables along with those under study. Each horse was brought to the racing stable and kept in a single horse stall. They were fed and cared for in a manner which was typical for race horses. To reduce the influence of nonspecific factors on the animals' emotional reaction, all the horses were fed the same diet and were

cared for by only one of the three unfamiliar persons at the training center. All three caretakers were adult men with long-term experience in caring for race horses. To eliminate the influence of the human factor on horse response, the horses from each group were divided into three subgroups, with three or four horses in each subgroup. Each subgroup was under the care of a different caretaker. The first caretaker cared for three Thoroughbred colts, three Thoroughbred fillies, four Purebred Arabian colts, and three Purebred Arabian fillies. The second caretaker took care of three Thoroughbred colts, four Thoroughbred fillies, three Purebred Arabian colts, and three Purebred Arabian fillies. The third caretaker was responsible for four Thoroughbred colts, three Thoroughbred fillies, three Purebred Arabian colts, and four Purebred Arabian fillies. From the start, the horses were unfamiliar with all the caretakers. These individuals had no knowledge about what was being tested.

During the first 3 days of their stay in the new training center, each horse was handled and brought out from the stall by their new caretaker. This procedure was carried out a few times to show the horse to a trainer or owner or to walk the horse to a paddock.

The experiment was performed in midwinter. All horses were without clinical symptoms of any illness. None of the fillies showed external symptoms of estrus during the study. The training course was in accordance with the rules developed by the trainer preparing the studied group of horses for races.

2.3. Training Method

The study lasted for 1 day. The day of the study was the horses' first day of race training. HR was measured at rest and during each of the actions mentioned later in the text. Before the horses started their training session, an elastic belt with a transmitter for telemetric HR registration (POLAR RS800CX, OY ELECTRO, Kempele, Finland) was put around the chest of each horse. After activation of the telemetric set, the horses were left alone in the stalls for about 5 minutes to achieve the resting values of their HR. Then the horses were handled and moved from their stall to the automated horse walker. For all subjects, HR was continuously measured in 15-second intervals until 5 minutes after their return to the stalls. To identify the beginning and the end of each action, the human being had to press the lap bottom of the telemeter on starting and terminating the activity. This was done to identify the area of analysis. The data were downloaded from the transmitter to a computer using interface. To analyze the obtained HR data, Polar Precision Performance™ program (Kempele, Finland) was used.

On the day of the study, the horses were handled only by the caretaker who had cared for them for the last 3 days. They were moved from the stable to the automated horse walker. Two identical walkers with places for six horses each were used. The walkers were located very close to each other. On each automated walker, five of the studied horses were walked. The horses were put on and tied to this device in a random order. After they were on the automated walker, they walked without the presence of any caretakers or other horses not under study. They walked on the horse walker for about 20 minutes. The speed of the

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