Applied Animal Behaviour Science xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Applied Animal Behaviour Science

journal homepage: www.elsevier.com/locate/applanim

Original research paper

Temperament test for donkeys to be used in assisted therapy

Carlos Antonio Gonzalez-De Cara[a], Alejandro Perez-Ecija[a], Raul Aguilera-Aguilera[a], Evagenlina Rodero-Serrano[b], Francisco Javier Mendoza[a,*]

[a] Department of Animal Medicine and Surgery, University of Cordoba, Spain
[b] Department of Animal Production, University of Cordoba, Spain

ARTICLE INFO

Article history:
Received 26 July 2016
Received in revised form 30 October 2016
Accepted 6 November 2016
Available online xxx

Keywords:
Assisted therapy
Behaviour
Donkeys
Sensory tests
Temperament tests

ABSTRACT

Donkeys are used in animal-assisted therapy (AT) for mental disorders or motor disabilities in elderly people and children, but tests for selecting donkeys for AT have not been studied. The aim of this work was to characterize donkey's reaction to sensory (tactile and sound) and temperament (fearfulness and reactivity to human) tests in order to select donkeys for AT. Sound test, tactile tests (stifle-haunch axis test, von Frey filament test and a novel test described by the authors), fearfulness (novel object, surprise and crossing an unknown surface tests) and reactivity to human (unfamiliar passive and active human tests) were evaluated in thirty-six Andalusian donkeys. Descriptive analysis was performed and differences between groups were determined. Donkeys were not very reactive to sound stimuli. Donkeys were more reactive to thinner filaments and instruments, with no body side laterality detected. A cutaneous sensitivity mapping was also established. In relation to temperament tests, donkeys were more reactive to visual than sound stimuli. Donkeys appear to be markedly cautious and an unexpected stimulus disrupts their routine longer time than a stimulus that approaches slowly and gradually. Moreover, donkeys seem to have a reserved character. Age affected human interaction tests, since longer time was needed to finish some tests in older donkeys. In conclusion, aforementioned tests can be used for AT selection, allowing to discard donkeys with undesired traits. Further studies are necessary to investigate age or breed effect on aptitude for AT.

1. Introduction

Donkeys have been historically interwoven with human development, contributing to technical advancements and economic growth (Sgorbini et al., 2013; Ali et al., 2015). Nowadays, donkeys are used for assisted-therapy (AT) in elderly people with mental disorders (Piva et al., 2008; Le Roux and Kemp 2009) or children with autism or motor disabilities (De Rose et al., 2011; Borioni et al., 2012).

Other species are also used for AT such as horses or dogs (Batson et al., 1998; Gehrke et al., 2011), and guidelines for selecting these animals are established (Batson et al., 1998). Although donkeys show excellent skills for AT (Amendola et al., 2012), to the author's knowledge there are no published guidelines for selecting these animals for AT.

The most important characteristic in selection for AT is the temperament, which has been studied with numerous behavioural tests in horses (Wolff et al., 1997; Momozawa et al., 2005). Knowledge on donkeys' normal response to standardized behavioural tests is scarce (French JM, 1993), and extrapolation of data from horses to donkeys has been proved about different topics to be invalid (Mendoza et al., 2011, 2013, 2015).

Currently information regarding dimensions such as sensory sensitivity, fearfulness and anxiety in donkeys is lacking, making it necessary to study them in order to objectively select animals for AT. A proper selection prior to AT is cardinal in order to avoid any danger for human patients and/or stress in the animal. Moreover, the lack of standardization on behavioural tests in this species hinder a more extensive understanding of its idiosyncrasies. We hypothesized that donkeys' response to behavioural tests is different from those reported for other species as horses. Therefore, the aims of this work were to characterize donkey's response to sensory (tactile and sound) and temperament (fearfulness and reactivity to human) tests.

* Corresponding author at: Department of Animal Medicine and Surgery, Campus Universitario Rabanales, 14014, Cordoba, Spain.
E-mail address: fjmendoza@uco.es (F.J. Mendoza).

http://dx.doi.org/10.1016/j.applanim.2016.11.006
0168-1591/

Table 1
Scores for the intensity response during the sound test.

Score	Reaction
0	No reaction. Donkey continued eating.
1	Ear movements. Donkey continued eating the food.
2	Head movement. Donkey turned the head towards the stimulus but continued chewing the food.
3	Head movement and body movement (<1 m). Donkey turned the head and body towards the stimulus and stop feeding.
4	Escape reaction.

Modified from Lansade et al. (2008c).

Table 2
Scores for the intensity response during the Stifle-Haunch axis stimulation test.

Score	Reaction
0	No reaction.
1	Donkey directed the attention to stimulus (ear and eyes). Stand on station. Trembling of the stimulated area.
2	Donkey directed the attention to stimulus (ear and eyes). Stand on station. Moved the leg.
3	Donkey directed the attention to stimulus (ear and eyes). Tail and lateral body movement.
4	Donkey directed the attention to stimulus (ear and eyes). Aggressive reaction/movement.

2. Material and methods

2.1. Animals

Thirty-six female non-pregnant donkeys, Andalusian and cross-bred, with a mean age of 5.79 ± 2.71 years old, were included in this study. Jennets came from six different farms with similar handling and feeding premises.

Inclusion criteria were: clinically healthy and accustomed being handled by an operator (haltered and tethered). All animals had similar handling and previous human contact before of study. All animals received humane care in compliance with the national guide for the care and use of laboratory and farm animals in research. This study received approval from both local and regional Welfare Committees.

2.2. Test arena and animal habituation

Every animal was introduced alone into the arena in order to become used to the test conditions. Habituation phase finished when the subject stayed in the arena without any reaction. Each donkey was introduced in the arena several times in order to check habituation. This process was performed always by the same operator and in a similar manner in every donkey.

The test arena consisted of a sand-bedded pen (6 × 3 m) delimitated and divided into three zones (Fig. 1A). The same protocol was followed in each farm following the same testing order: reactivity to human, followed by fearfulness tests and finishing with sensory tests. All donkeys were fed early in the morning (7 am) and tests were performed over the course of the morning (from 9 am to 2 pm). For tactile tests, donkeys were held by one observer while another one performed the tests. All tests were recorded for later analysis by three independent observers (results are expressed as mean of these three observations) (Dalla et al., 2015; Minero et al., 2016).

2.3. Sensory tests

2.3.1. Sound test

A transmitter (Unitec. Murcia, Spain) was placed at 6 m from the animal and a 70 db sound was played during 1.5 s while the donkey was eating (Fig. 1A). All animals had been feed early in the morning prior to begin the tests. The food introduced into the bucket was the same as that used for feeding every day. Reactions were scored using a modified grade scale (Table 1) (Lansade et al., 2008c). Time to resume feeding after the stimulus was recorded. Test duration was 600 s and a value of 601 was assigned to donkeys not finishing the test (also applicable to temperament tests). Test was considered unfinished if the animal spent more than 10 min without returning to feed.

2.3.2. Tactile tests

- Von Frey filaments test (VFF). Different von Frey filaments (Stoelting. Dublin, Ireland) – 0.008, 0.02, 0.16, 0.6, 8, 60 and 300 – were applied to: front, neck, withers, back, forelimbs, ribs, stomach, rumps, buttocks and hind limbs of both sides of the body (Lansade et al., 2008c). Reaction was coded as response (trembling similar to non-painful panniculus twitch) or not.
- Stifle-haunch axis stimulation test (SHAS). 3-cm wide instruments of different hardness: wood, hard paintbrush, plastic and rubber were moved upwards along the stifle-haunch axis keeping the pressure constant. The reaction intensity was graded using a modified scale based on a previous report by Lansade et al. (2008c) (Table 2).
- Combined test. A combination of the previous tests was standardized by our group. Same instruments of SHAS were applied to body areas described for VFF. Reactions were recorded as response (twitch) or not.

2.4. Temperament tests

2.4.1. Fearfulness tests

- Static novel object test (SNO). Following previous descriptions (Forkman et al., 2007), a black tripod was placed near the food bucket (Fig. 1B) for 10 min. Time to cross the arena and begin to eat was determined. Additional behavioural variables were recorded (Table 3).
- Crossing an unknown surface test (CUS). A black plastic was placed on the zone B (Fig. 1C) (Gorecka-Bruzda et al., 2011). Time to step onto the unknown surface, time spent over it and time to reach the food bucket were recorded. Additional behavioural variables were collected (Table 3).
- Surprise test. Subjects were allowed to eat for 3 s and then a black umbrella was opened in front of them (Gorecka-Bruzda et al., 2011) (Fig. 1D). Time between surprise and return to feeding as well as additional behavioural variables were recorded (Table 3).

2.4.2. Reactivity to human tests

- Unfamiliar passive human test (UPH). An experimenter without previous contact with the donkeys entered the test arena and stayed motionless in zone C (Fig. 1C) for 600 s. Test ended when the animal touched the experimenter or 601 s were reached (Seaman et al., 2002). Behavioural variables were recorded (Table 3).
- Unfamiliar active human test (UAH). An unfamiliar experimenter (another different to previous experimenter) moved slowly (approximately 1 step/s) from zone A (at a distance of 6 m) towards the donkey, trying to touch the back for 1 s and the muzzle for 3 s (Seaman et al., 2002). Time for every parameter was recorded and behavioural variables were collected (Table 3).

Please cite this article in press as: Gonzalez-De Cara, C.A., et al., Temperament test for donkeys to be used in assisted therapy. Appl. Anim. Behav. Sci. (2016), http://dx.doi.org/10.1016/j.applanim.2016.11.006