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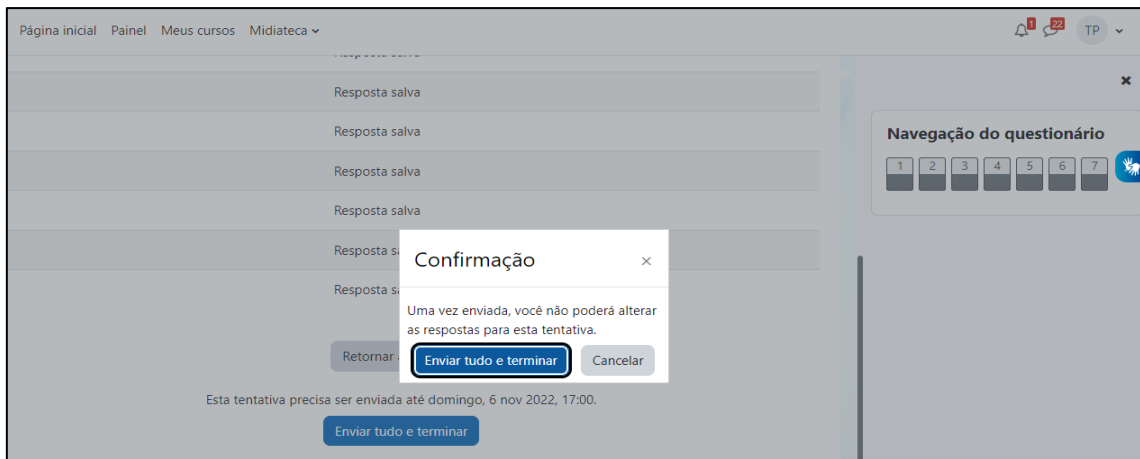
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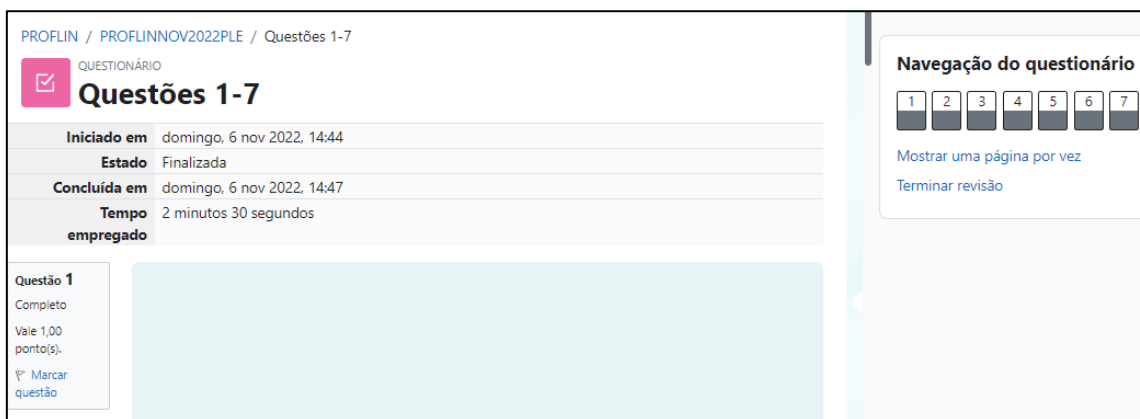
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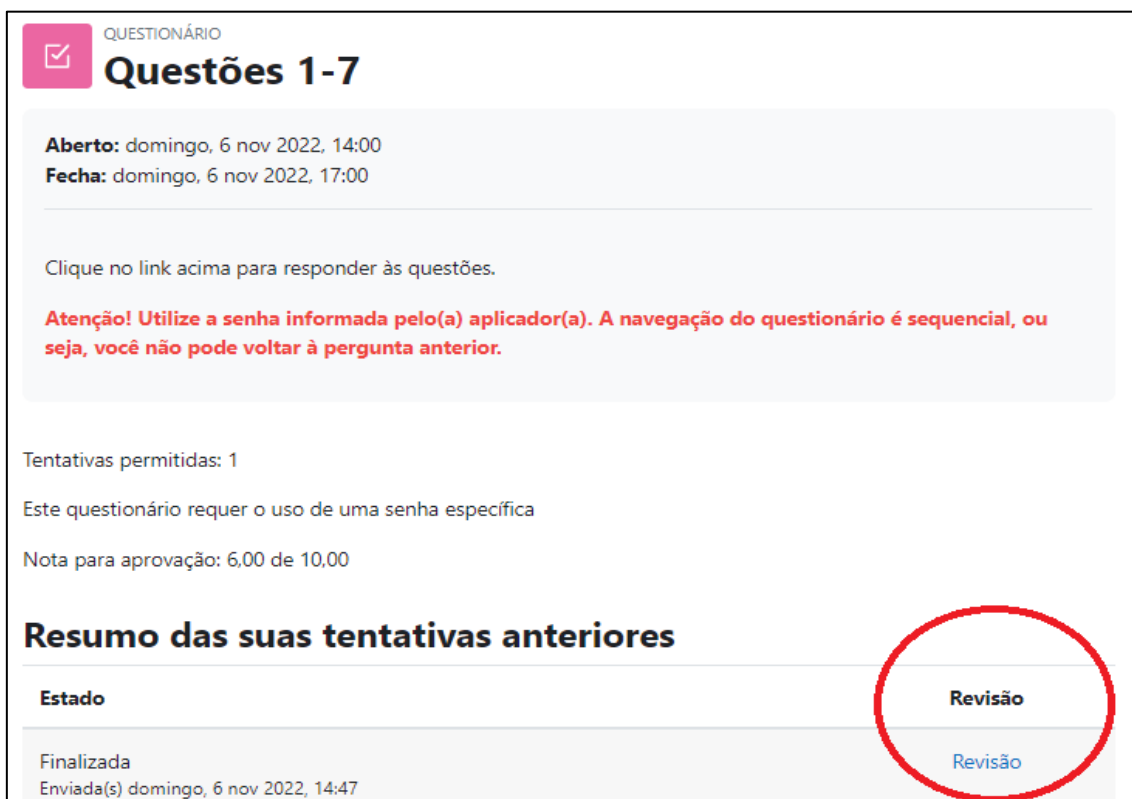
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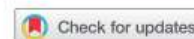
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ARTICLE



The Effect of an Irregular Feeding Schedule on Equine Behavior

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ABSTRACT

We used eight horses 1 to 12 years old to investigate the influence of irregular feeding times on the behavior. The animals were housed in individual boxes, fed with hay *ad libitum* and barley-oat mixture at three set times; 05:00 (earlier feeding) on Thursdays, 07:00 (delayed feeding) on Saturdays and 06:00 (regular feeding) on other weekdays. Direct observations took place in 10 continuous weeks; they started 1 h prior to feeding and lasted for 2 h. Long-term behaviors (i.e. hay and concentrate consumption, resting) were recorded every 5 min, short-term behaviors (i.e. kicking, pawing the ground, comfort behavior, taking a look toward the door) were recorded continuously. Compared to the regular feeding time, horses spent less time consuming hay, more time resting and less often took a look toward the door during the earlier feeding, whereas during the delayed feeding horses more often performed pawing the ground, kicking, comfort behavior, and took a look toward the door ($p < .05$). Our results indicate that deviations from the regular feeding schedule affected the behavior of horses and compromised their temporal predictability.

KEYWORDS

Horse; behavior; anticipation; predictability; feeding

Introduction

A temporal predictability of management routines, such as feeding, has been found to enable animals to better cope with their environment (Johannesson & Ladewig, 2000) while unpredictable and/or uncontrollable situations are often perceived as stressors by animals (Koolhaas et al., 2011). If an animal is not able to foresee or control negative as well as positive events, it may perceive such a situation as stressful. This leads to behavioral and physiological stress response indicating that animal welfare is compromised (Wiepkema & Koolhaas, 1993). However, the results of studies, which focus on the effect of an unpredictable feeding time on animal behavior and welfare, are rather inconsistent or even contradictory; some of the studies suggested unpredictable feeding time to reduce abnormal behaviors (Bloomsmith & Lambeth, 1995) and prevent stress (Waite & Buchanan-Smith, 2001), while the others emphasized the importance of predictable feeding time to reduce aggression (Carlstead, 1986; Jones, Noble, Damsgard, & Pearce, 2012) and stress (Gottlieb, Coleman, & McCowan, 2013; Uyan et al., 2006). Furthermore, the majority of studies has been done in captive wild animals, e. g. chimpanzees (Bloomsmith & Lambeth, 1995), stump-tailed (Waite & Buchanan-Smith, 2001) and rhesus macaques (Gottlieb et al., 2013), fish (Jones et al., 2012) and only seldom in farm animals (Carlstead, 1986; Johannesson & Ladewig, 2000), including horses.

In horses, it is highly recommended to avoid sudden or large changes in their daily routine, especially in feeding, turning out and exercise, which are the most positive events in horses' daily routine (Mills & Clarke, 2007). Regarding feeding practice, it is well-known that rapid and major changes in diet (volume or composition) and feeding occasions are related to digestive disorders (Davidson & Harris, 2007; Tinker et al., 1997) as well as stereotypies' incidence (Cooper &

McGreevy, 2007). However, almost nothing is known about sudden changes in feeding time, especially about their influence on horses' behavior and welfare, although in leisure horses or horses used for sport and work, it is often difficult to keep management routines regular due to different factors that influence owner's spare time, work or competitions. Ninomiya, Kusunose, Sato, Terada, and Sugawara (2004) provided some evidence about the delayed feeding time suggesting that it may increase the duration of hay-eating and bedding investigation, the latter interpreted as frustration due to suppressed consummatory behavior. Cooper and McGreevy (2007) suggested that predictable feeding schedules, when horses are being fed approximately at the same time for years, may lead to stereotypies. Bezdekova, Jahn, and Vyskocil (2008), on the contrary, found no association between feeding regularity and horse's gastric health.

A scarcity of studies, which researched the effect of unpredictable feeding times on the behavior of horses and welfare and inconsistency of their results, justifies further investigation. Additionally, to our knowledge, there has been no study looking at the effect of earlier feeding time on the behavior of horses and welfare. Therefore, we conducted a study with eight horses housed in single stalls, a predominant form of housing in different countries (Korries, 2003; Søndergaard & Christensen, 2002; Starc, 2016), to investigate whether earlier or delayed feeding time influences the behavior of horses.

Material and methods

Animals, housing and management

The experiment was carried out in a private horse center in Slovenia. The subjects were eight horses in the range of 1 to 12 years of age. Four of them were trotter horses (Slovenian trotter) and the other four were riding horses (three of Slovenian warm-blood horse, one of Arabian thoroughbred horse). The horses were either born and raised on the mentioned horse center or purchased from other horse centers in Slovenia. The group consisted of five mares and three geldings. The horses were housed in a stable with individual straw-bedded boxes (3.5 m × 4.0 m). The bottom part of the partitions dividing boxes was made of solid wooden panels, while the top part was made of vertical lattice bars. Each day, trotter horses had an individual training for 1 h, while riding horses were periodically used for field riding. Horses were fed indoors once a day, usually at 06:00, when they received their morning meal, which represented the major component of their diet. Horses were always fed by the same caretaker and in the same turn. They were turned out to the pasture after feeding at around 08:00.

At feeding, which took a few minutes, horses received barley-oat mixture and soon after also fresh hay. Hay was offered *ad libitum*, while the amount and the composition of the concentrate were adjusted to the horse's weight, size and daily workload. During the study, the horses received on average 1.6 kg of concentrate per individual in a feed trough (dimension of a hole above it 47 cm × 41 cm × 16 cm) placed in the left front corner of the box at the height of 55 cm. Hay was placed on the ground in the corner under the feed trough. Available roughage thus consisted of both, straw and hay, and enabled animals to forage and explore. Water was available *ad libitum* from an automatic water supplier in the back right corner. Each animal had access to a mineral lick. Dirty litter was removed when necessary in order to keep the box as clean as possible and fresh straw was added. For the purpose of the study, animals were fed at three different times, each feeding time representing a treatment: as usual at 06:00, 1 h earlier (at 05:00) and 1 h later (at 07:00). The usual feeding time was considered as a regular treatment, feeding at 05:00 as earlier and feeding at 07:00 as delayed treatment (Figure 1). Feeding times at 05:00 and 07:00 were considered as irregular feeding times. The horses were fed at 05:00 on Thursdays, at 07:00 on Saturdays and at 06:00 on other days within the week.

Behavioral observations

The behavior of horses was recorded directly during summer months by one observer for 10 weeks, 3 days a week, Tuesdays, Thursdays and Saturdays. On each of the observation days, the recordings

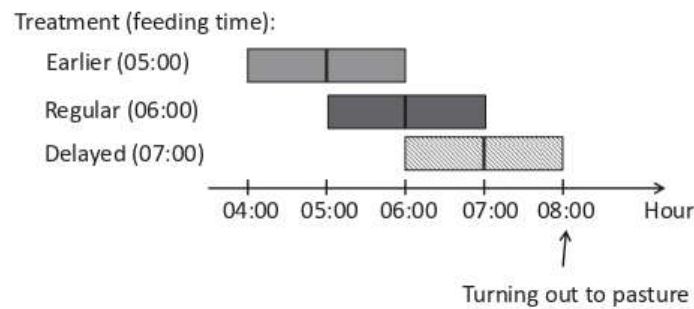


Figure 1. Observation period and treatments regarding the feeding time.

lasted two continuous hours, starting 1 h before feeding and ending 1 h after feed delivery (Figure 1). In order to prevent the observer's influence on horse behavior, the observer watched the animals through a window from the outside the stable. This position of the observer enabled simultaneous recording of behavior of all eight horses. The ethogram used for observations is presented in Table 1. The long-term behaviors were recorded every 5 min, which accounted to 24 intervals per 2 h of observation period. In the results section, these behaviors are presented as a percentage of observations spent for a particular behavior per observation period and animal. The short-term behaviors were recorded continuously and are presented as a frequency per observation period and animal.

Statistical analysis

The statistical data analysis was conducted using GLIMMIX procedure in the SAS/STAT statistical program package (SAS/STAT, 2011). For the purpose of the analysis, some of the behaviors were aggregated: comfort behavior included stretching and auto-grooming, kicking included kicking with

Table 1. Behaviors recorded during observations and their definitions.

Behavior	Definition
Concentrate consumption ^L	Head positioned inside the feed trough and taking barley-oat mixture diet into mouth.
Hay consumption ^L	Taking hay into mouth with a lowered head and neck and making mouth movements under or in front of a feed trough.
Standing ^L	Standing with a) normal head position without target directed head movements and without one hind leg resting (normal standing) or b) with a head positioned high, usually with a target directed head movements, ears pointing in the direction in which the horse is looking with its eyelids fully opened (standing alert) or c) with lowered head, one hind leg in a rest position and eyelids half open or closed (standing at rest).
Lying ^L	Lying slightly on the side of its chest with one foreleg and one hind leg underneath the body.
Manipulation with a drinking bowl ^L	Oral activities with a drinking bowl but without drinking or drinking little.
Manipulation with a feed trough ^L	Oral activities with an empty feed trough.
Drinking ^S	Mouth positioned inside the drinking bowl with head still and taking water into mouth and swallowing it.
Neighing ^S	Vocalization with the long, high-pitched sound.
Kicking with a fore leg ^S	To strike with a front leg at the ground or forwards.
Kicking with a hind leg ^S	To strike with a hind leg at the ground or backwards.
Circling ^S	Circular box walking.
Scraping the teeth on the surface ^S	To pull back its lips and rub a wooden surface of the stall partition forcefully with the teeth.
Pawing the ground ^S	To drag with a front leg along the ground.
Stretching ^S	Flexion at the throat, arching of the neck, straightening of the back, elevation and movement of the tail and full extension of the hind limbs.
Auto-grooming ^S	Different forms of body care such as scratching, rubbing, shaking and licking.
Taking a look toward the door ^S	A look at the stall door with attention, with the head heightened and turned toward the door.

L – Long-term activity, S – short-term activity

foreleg or hind leg, resting included standing and lying. The following statistical models were chosen: a) Poisson regression model for the analysis of the following short-term behaviors: comfort behavior, taking a look toward the door, kicking and pawing the ground, and b) Negative Binomial regression model for the analysis of the following long-term behaviors: concentrate consumption, hay consumption and resting. All the models included the factor of treatment ($n = 3$; earlier, regular and delayed) and animal nested within the treatment ($n = 8$) as random factor. Horses performed also drinking, neighing, circling and scraping the teeth on the surface, but at a very low frequency that accounted for around 90% of zeros per individual behavior in the observation period. The analysis of these observed behaviors could not be performed due to insufficient data variability. The manipulation with a drinking bowl and a feed trough accounted to 0.78% and 1.23% of the total observed time, respectively, and thus we considered them not to be used for the analysis due to a low frequency. The models for the majority of behaviors did not converge when the effect week was included; hence the models only included treatment as a fixed effect.

Results

Irregular feeding of horses affected both the long-term and short-term behaviors. It had a significant influence on the time the horses spent consuming hay ($F = 7.93$; $p < .01$) and resting ($F = 9.26$; $p < .01$), but it did not influence the time horses spent consuming concentrate ($F = 0.32$; $p > .10$; Figure 2). When fed earlier, horses spent less time consuming hay and rested longer compared to when fed at the regular time or 1 h later. The feeding time also significantly influenced the frequency of comfort behavior ($F = 7.65$; $p < .01$; Figure 3), taking a look toward the door ($F = 129.21$; $p < .0001$), kicking ($F = 3.91$; $p < .05$) and pawing the ground ($F = 5.99$; $p < .01$). When fed earlier, horses took a look toward the door significantly less often than when fed at the regular time. When fed later, horses significantly more often performed comfort behavior, took a look toward the door, pawed the ground and kicked compared to when fed at the regular or earlier feeding time.

Discussion

The main finding of our study is that the earlier and the delayed feeding times generated different expressions of observed behaviors in stabled horses, indicating that horses knew at what time they got feed. Feeding is one of the most positive event in captive animals' daily routine (Bassett & Buchanan-Smith, 2007; Carlstead, 1986) and if performed at a regular time

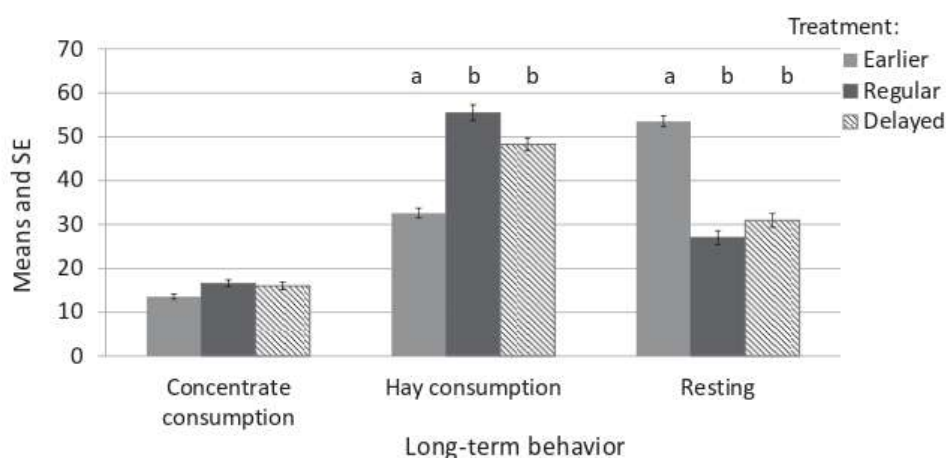


Figure 2. The influence of feeding time on the proportion of time (%) of long-term behaviors presented as means and standard errors (SE) of the 2 h of observations per treatment. Significant differences within individual behavior are indicated by different letters (a, b).

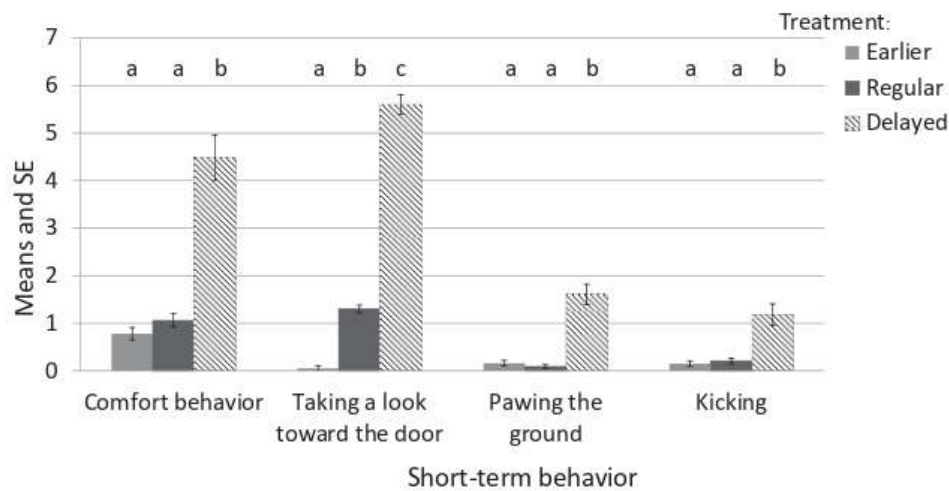


Figure 3. The influence of feeding time on the frequency of short-term behaviors presented as means and standard errors (SE) of the 2 h of observations per treatment. Significant differences within individual behavior are indicated by different letters (a, b, c).

each day animals learn to predict the time of feeding due to their endogenous clock (Mistlberger, 1994). It is also known that signals, which always precede feeding, e.g. random sounds connected with preparation and distribution of feed, act as conditioned stimuli and function as cues to the oncoming feeding, enabling animals to predict the feed arrival even more precisely (Nicol, 2005; Peters, Bleijenbergh, van Dierendonck, van der Harst, & Spruijt, 2012). Similar as horses in our study, farm animals like pigs (Carlstead, 1986) and calves (Johannesson & Ladewig, 2000) or captive wild animals like chimpanzees (Bloomsmith & Lambeth, 1995), rhesus macaques (Gottlieb et al., 2013) and coyotes (Gilbert-Norton, Leaver, & Shivik, 2009), customized to predictable feeding time, react to deviations from their regular feeding schedule or reliable feeding signals with changes in their behavior.

Earlier feeding

When horses were fed earlier, they spent significantly less time-consuming hay compared to when they were fed at the regular time. Since horses are trickle feeders (Davidson & Harris, 2007), we would expect them to take advantage of the earlier feeding and spend ingesting hay at least for as long as when fed at the regular time. However, when animals are regularly fed at the same time, they adapt their physiology and behavior to match their daily meal (Feillet, 2010), which enable them to prepare for feed ingestion. Therefore, our results suggest that within 2 h before regular feeding, the physiology and behavior of a horse were not yet directed to hay consumption. This is further supported with the significantly longer time they spent resting, when their feeding time was earlier than usual. The horses did not expect to be fed yet and consequently did not start preparing for feeding by waking up and being as active as they would usually do in the hours prior to the expected feeding (Feillet, 2010). Their unpreparedness for feeding was confirmed also by a very small frequency of taking a look toward the door which was significantly lower compared to the regular feeding time. Our interpretation could further be strengthened if that was before the concentrate feeding versus afterward, but unfortunately, we did not record the behaviors on hourly bases only for the full 2-h period. Although the duration of hay consumption and resting when fed earlier indicated that the horses were not motivated for eating prior to the regular time, the time of feeding did not significantly influence the consumption of the barley-oats mixture. This is not surprising since the palatable cereal-based concentrate was offered to the horses only once per day in a limited quantity

and it is known that the feed palatability strongly influences motivation for ingestion (Julliand, Philippeau, Goachet, & Ralston, 2008).

Delayed feeding

The delayed feeding time did not affect any of the observed long-term behaviors compared to regular feeding time. This contradicts the findings of Ninomiya et al. (2004) where a tendency in the increase of hay consumption was found in the delayed feeding. A similar duration of resting at the regular or the delayed feeding most likely indicates that our horses expected feeding at the regular time. This argumentation is supported by Feillet (2010), who stated that animals fed every day at the same time wake up and start to be active prior to the hour of the expected feeding. The delayed feeding, however, significantly increased the frequency of all observed short-term behaviors compared to the regular feeding time. An increased performance of these behaviors was most likely an expression of the horses' pre-feeding anticipatory behavior. Also in other studies, where animals were fed at a regular time for a longer period of time (e.g. Bassett & Buchanan-Smith, 2007; Johannesson & Ladewig, 2000; Ulyan et al., 2006), it was reported that delayed feeding resulted in display of anticipatory behavior. Anticipatory behavior is defined as behavioral activity significant for the period between a signal indicating the arrival of a rewarding event and the actual arrival of the reward (Boissy et al., 2007). Receiving feed, especially concentrates, it represents one of the most rewarding events in horses' daily routine (Mills & Clarke, 2007). In our study, horses more often took a look toward the door, most probably because they heard familiar sounds outside the barn announcing feeding time. They also more frequently pawed the ground and kicked, which are features often referred to as behavioral patterns of anticipatory behavior in horses (Cooper & McGreevy, 2007; Peters et al., 2012). It is known that as the interval between cues to the oncoming feeding and feed arrival progresses, the average level of anticipatory behavior increases (Balsam, Sanchez-Castillo, Taylor, Van Volkinburg, & Ward, 2009). Our horses' response may be even more distinct since they were awaiting the concentrate, their preferred feed (Goodwin, Davidson, & Harris, 2005), which may therefore have affected them as a supernormal stimulus (unusually potent or intense stimulus; Mendl, 1997). Additionally, they might have also anticipated to be turned out to the pasture, a management routine that the horses were used to. Especially by kicking the door or the wall, horses seek for an attention (Broom & Fraser, 2015; Cooper & McGreevy, 2007) for they must have previously learned that such a behavior results in receiving a reward, e.g. being fed earlier (Cooper & McGreevy, 2007).

Our horses more often demonstrated comfort behavior when feeding was delayed, which may be interpreted as a sign of anticipation or frustration. Increased comfort behavior associated with an anticipation of positive event was reported in rats (van der Harst, Baars, & Spruijt, 2003), laying hens (Zimmerman, Buijs, Bolhuis, & Keeling, 2011) and calves (Johannesson & Ladewig, 2000). However, numerous studies reported increased grooming in situations causing anxiety (Castles & Whiten, 1998; Molesti & Majolo, 2013) or frustration (Waitt & Buchanan-Smith, 2001). Frustration is a motivational state that occurs when animal is thwarted or blocked in its attempts to achieve a goal (Hurnik, Webster, & Siegel, 1995; Mills et al., 2010) and is a sign of poor animal welfare (Broom & Johnson, 1993; Nicol, 2011). Additionally, pawing the ground has been reported to occur when horses are frustrated, mainly in relation to obtaining feed (Broom & Fraser, 2015; Fraser, 1992; Houpt, 1986; Hurnik et al., 1995). There seems to be two possible explanations for the increase in the performance of short-term behaviors because of 1-h delay in feeding: it was either a performance of pre-feeding anticipatory behavior or a demonstration of signs of a certain degree of frustration because the horses' expectations to be fed at the regular feeding time were not fulfilled.

Conclusions

The horses were used to regular feeding schedule, therefore, they reacted to deviations from it by changes in their behavior. If they were fed earlier than expected, the horses spent less time consuming hay and more time resting which indicate they were not ready to consume hay yet. When they were fed later than expected, the horses showed an increase in taking a look toward the door, kicking, pawing the ground and comfort behavior which may be an indication of a certain degree of pre-feeding anticipation or frustration. Our results suggest that inclusion of irregular feeding times in the feeding management cause horses to lose their temporal predictability. We propose horse caretakers to maintain daily management routine as stable as possible.

Acknowledgments

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INGLÊS

BIOMÉDICAS

TEXTO-BASE: Zupan, M; et al. The Effect of an Irregular Feeding Schedule on Equine Behavior. *Journal of Applied Animal Welfare Science*, núm. 23, vol. 2, 2020, pp. 156–163.

QUESTÃO 1:

Enunciado: Em relação à alimentação de cavalos e seu bem-estar, analise as proposições a seguir e assinale a alternativa **CORRETA**:

- I – Em cavalos, a falta de controle ou previsão sobre algumas situações, incluindo a alimentação, tem sido associada ao estresse nesses animais.
- II – Em cavalos, estresse de natureza psicológica ou fisiológica podem comprometer o bem-estar desses animais.
- III – A literatura aponta que a falta de previsibilidade no horário da alimentação sempre reduz o aparecimento de comportamentos fora do normal.
- IV - A literatura aponta que a falta de previsibilidade no horário da alimentação sempre previne o aumento de estresse nesses animais.

Gabarito:

- a) As alternativas I e II estão corretas.

Justificativa: Na introdução, os autores contextualizam o estudo informando que, em se tratando de cavalos, a falta de controle ou previsão sobre algumas situações, incluindo a alimentação, por exemplo, tem sido associada ao estresse nesses animais, que pode ser de natureza psicológica ou fisiológica. Nesse sentido, seu bem-estar pode ser comprometido. Ainda, os autores explicam que não há necessariamente um consenso na literatura quando se trata da relação da previsibilidade temporal da alimentação dos cavalos e seu comportamento, pois, em alguns casos, a literatura mostra a redução de comportamentos anormais, enquanto em outros casos há aumento de estresse. Portanto, as alternativas I e II estão corretas.

Distratores:

- b) As alternativas II e III estão corretas.

- c) As alternativas I e III estão corretas.
- d) As alternativas II e IV estão corretas.

QUESTÃO 2:

Enunciado: Em relação à alternativa que melhor expressa o objetivo e a justificativa do estudo, assinale a alternativa **CORRETA**:

Gabarito:

- a) O estudo busca investigar o impacto da alteração temporal da alimentação de cavalos no comportamento desses animais, incluindo seu bem-estar. A principal motivação do estudo pauta-se na escassez de pesquisas que examinam o efeito da imprevisibilidade do horário da alimentação de cavalos à luz da inconsistência dos resultados reportados na literatura.

Justificativa: Os autores explicitam, no último parágrafo da introdução, o objetivo do estudo e a principal motivação para realizá-lo. “A scarcity of studies, which researched the effect of unpredictable feeding times on the behavior of horses and welfare and inconsistency of their results, justifies further investigation. Additionally, to our knowledge, there has been no study looking at the effect of earlier feeding time on the behavior of horses and welfare. Therefore, we conducted a study with eight horses housed in single stalls, a predominant form of housing in different countries (Korries, 2003; Søndergaard & Christensen, 2002; Starc, 2016), to investigate whether earlier or delayed feeding time influences the behavior of horses.” (p. 2). Portanto, o estudo busca investigar o impacto da alteração temporal da alimentação de cavalos no comportamento desses animais, incluindo seu bem-estar. A principal motivação do estudo pauta-se na escassez de pesquisas que examinam o efeito da imprevisibilidade do horário da alimentação de cavalos à luz da inconsistência dos resultados reportados na literatura.

Distratores:

- b) O estudo busca confirmar o impacto positivo da alteração temporal da alimentação de cavalos no comportamento desses animais, incluindo seu bem-estar. A principal motivação do estudo pauta-se nos resultados reportados na literatura, especialmente aqueles por Bezdekova, Jahn e Vyskocil (2008).
- c) O estudo busca examinar o impacto da alteração temporal da alimentação de cavalos no comportamento desses animais, incluindo seu bem-estar. A principal motivação do estudo pauta-se nas evidências fornecidas por Ninomiya e colegas (2014), que reportaram aumento na duração do pasto de feno.
- d) Nenhuma alternativa está correta.

QUESTÃO 3:

Enunciado: Com relação aos materiais e métodos, analise as proposições a seguir e assinale a alternativa **CORRETA**:

- I – Oito cavalos, com idade de um a doze anos, participaram do experimento na Eslovênia, sendo quatro deles trotadores e quatro de montaria (cinco éguas e três castrados).
- II – Ao serem alimentados por cinco minutos, os cavalos recebiam uma mistura de cevada e aveia. Em seguida, feno fresco era fornecido.
- III – Água e feno eram oferecidos à vontade, ainda que a quantidade e a composição do último tenham sido ajustadas ao peso, tamanho e carga de atividades do animal.
- IV – Os animais eram alimentados em três horários diferentes, cada um relativo a um tratamento específico: às 06h (regular), uma hora antes (antecipado) e uma hora depois (atrasado).

Gabarito:

- a) Todas as alternativas estão corretas.

Justificativa: Na seção “Materiais e métodos”, os autores fornecem dados sobre os animais participantes da pesquisa e o método empregado no estudo. No primeiro parágrafo da seção, os autores caracterizam os cavalos participantes do estudo: Oito cavalos, com idade de um a doze anos, participaram do experimento na Eslovênia, sendo quatro deles trotadores e quatro de montaria (cinco éguas e três castrados). (“The experiment was carried out in a private horse center in Slovenia. The subjects were eight horses in the range of 1 to 12 years of age. Four of them were trotter horses (Slovenian trotter) and the other four were riding horses (three of Slovenian warm-blood horse, one of Arabian thoroughbred horse). The horses were either born and raised on the mentioned horse center or purchased from other horse centers in Slovenia. The group consisted of five mares and three geldings”). No segundo parágrafo da seção, os autores fornecem dados sobre a alimentação dos cavalos e os horários de comparação (tratamento e controle): ao serem alimentados por cinco minutos, os cavalos recebiam uma mistura de cevada e aveia. Em seguida, feno fresco era fornecido. Água e feno eram oferecidos à vontade, ainda que a quantidade e a composição do último tenham sido ajustadas ao peso, tamanho e carga de atividades do animal. Os animais eram alimentados em três horários diferentes, cada um relativo a um tratamento específico: às 06h (regular), uma hora antes (antecipado) e uma hora depois (atrasado). (“At feeding, which took a few minutes, horses received barley-oat mixture and soon after also fresh hay. Hay was offered ad libitum, while the amount and the composition of the concentrate were adjusted to the horse’s weight, size and daily workload. For the purpose of the study, animals were fed at three different times, each feeding time representing a treatment: as usual at 06:00, 1 h earlier (at 05:00) and 1 h later (at 07:00)”).

Distratores:

- b) As alternativas I, II e III estão corretas.

- c) As alternativas I, II e IV estão corretas.
- d) As alternativas II, III e IV estão corretas.

QUESTÃO 4:

Enunciado: Com relação a algumas das diferenças observadas no estudo, analise as proposições a seguir e assinale a alternativa **CORRETA**:

- I – A proporção de tempo (em percentual) dos três comportamentos de longa duração revela o mesmo padrão de diferenças para os três tipos de tratamento, conforme a figura 2.
- II – A proporção de tempo (em percentual) dos quatro comportamentos de curta duração não revela o mesmo padrão de diferenças para os três tipos de tratamento, conforme figura 3.
- III – A proporção de tempo (em percentual) dos três comportamentos de longa duração não revela o mesmo padrão de diferenças para os três tipos de tratamento, conforme a figura 2.

Gabarito:

- a) A alternativa III está correta.

Justificativa: Com base nas informações apresentadas nas figuras 2 e 3, consegue-se perceber que a proporção de tempo (em percentual) dos três comportamentos de longa duração (figura 2) e os quatro tipos de comportamentos de curta duração (figura 3) para todos os três grupos de tratamento (antecipado, regular e atrasado) não revela o mesmo padrão. No caso dos três comportamentos de longa duração (figura 2), por exemplo, a categoria descanso destoa dos outros dois tipos de comportamento (o tratamento do tipo atrasado causa um leve aumento em relação ao tratamento do tipo regular). No caso dos quatro tipos de comportamentos observados de curta duração (figura 3), nem sempre os tratamentos antecipado e atrasado resultam num mesmo padrão de medidas (comparando-se, por exemplo, os dois primeiros comportamentos com os dois últimos).

Distratores:

- b) A alternativa I está correta.
- c) A alternativa II está incorreta.
- d) A alternativa III está incorreta.

QUESTÃO 5:

Enunciado: Os autores classificam os comportamentos observados dos cavalos em atividades de longa e de curta duração. Levando em consideração tal classificação, (i) cite três comportamentos classificados pelos autores como de curta duração e (ii) forneça uma definição acurada para cada um.

Resposta esperada: Espera-se que o candidato consiga localizar e compreender informações específicas do texto a partir da tabela 1. Os autores listam um total de 16 categorias que representam comportamentos observados nos cavalos participantes do estudo, agrupados em atividades consideradas de curta (dez) e de longa duração (seis). Os comportamentos de curta duração incluem desde beber água, relinchar, chutar com uma pata dianteira, chutar com uma pata traseira até mesmo circular no box e olhar em direção à porta. O candidato deve listar três dos comportamentos observados nos cavalos participantes do estudo classificados como de curta duração e fornecer uma definição, constante da tabela 1, acurada. Serão aceitas respostas que forneçam traduções aceitáveis para as categorias, sem o uso de termos em inglês.

QUESTÃO 6:

Enunciado: Os autores classificam os comportamentos observados dos cavalos em atividades de longa e de curta duração. Levando em consideração tal classificação, (i) cite três comportamentos classificados pelos autores como de longa duração e (ii) forneça uma definição acurada para cada um.

Resposta esperada: Espera-se que o candidato consiga localizar e compreender informações específicas do texto a partir da tabela 1. Os autores listam um total de 16 categorias que representam comportamentos observados nos cavalos participantes do estudo, agrupados em atividades consideradas de curta duração (dez) e de longa duração (seis). Os comportamentos de longa duração incluem consumir o concentrado e o feno durante a alimentação até deitar ou manipular a calha de alimentação. O candidato deve listar três dos comportamentos observados nos cavalos participantes do estudo classificados como de longa duração e fornecer uma definição, constante da tabela 1, acurada. Serão aceitas respostas que forneçam traduções aceitáveis para as categorias, sem o uso de termos em inglês.

QUESTÃO 7:

Enunciado: A partir dos resultados obtidos com o estudo, aponte (i) como a alimentação irregular afetou os comportamentos classificados como de curta e de longa duração (ii) fornecendo dados estatísticos.

Resposta esperada: Espera-se que o candidato consiga localizar e compreender informações específicas do texto a partir da seção de resultados, observando-se também dados constantes das figuras 2 e 3. Em síntese, os autores reportam que o horário irregular da alimentação dos cavalos afetou tanto os comportamentos classificados como de curta duração quanto os de longa duração. Houve influência no tempo de consumo de feno ($F = 7.93$; $p < .01$) e descanso ($F = 9.26$; $p < .01$), mas não houve impacto no tempo do consumo do concentrado ($F = 0.32$; $p > .10$). Quando o horário de alimentação era adiantado, os cavalos consumiam menos feno e descansavam mais em comparação com horários regulares ou atrasados de alimentação. O horário da alimentação também influenciou significativamente a frequência do comportamento

de conforto ($F = 7.65$; $p < .01$), olhar na direção da porta ($F = 129.21$; $p < .0001$), chutar ($F = 3.91$; $p < .05$) e arranhar o chão ($F = 5.99$; $p < .01$). Quando o horário da alimentação era adiantado, os cavalos olhavam menos para a porta do que quando eram alimentados no horário regular. Quando a alimentação era atrasada, os cavalos apresentavam comportamentos de conforto mais frequentemente, olhavam para a porta mais, arranhavam o chão com a pata e chutavam mais.