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Effect of Different Activity and Space Offers on the Activity Behaviour of Stallions

A continuous movement of horses maintains health and provides regeneration of the locomotor apparatus. On the other hand, cause missing offers for activity orthopaedic damages: joints, tendons and ligaments lose their mobility and elasticity. In different stallion keeping systems it has turned out that daily work and additional movement on the paddock have is very advantageous effect on the activity behaviour. One hour of work yielded the same sum of movement impulses as a paddock stay of four hours.

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Literature

Literature references can be called up under LT 07607 via internet http://www.landwirtschaftsverlag.com/landtec/local/literatur.htm.

The horse stock in Germany has increased within the last 20 years from about 350000 to more than a million animals. The horse enjoys increasing popularity as a leisure partner; the housing conditions very often do not meet the natural needs of the horses, though. Species-friendly horse keeping is not only a demand of the protection of animals law [8] but takes a high general request into account, particularly at the aspects of the sustainability and the environmental impact.

There are single and group housing systems for horses today. The most frequent form of keeping the horses still is stabling in individual boxes.

It is well-known from investigations that 84 % of the total horse stock is kept in single boxes and only 16 % in group keeping systems [1, 2, 5]. Analyses in stud farms have shown that horses spend up to 23 hours per day usually stationary in their box and on average daily they are moved more than one hour [3]. The recommendations by [5] have to be used for the dimensioning the individual boxes, when planning stables.

In many cases, the keeping of horses particularly of stallions, which have special demands on the keeping system, does not comply with the natural needs of the animals, however. This is indicated by the frequent appearance of psychological and physical illnesses, caused by the housing conditions [4, 6, 7, 8].

The objective of our investigations was the question, whether an individual box keeping of stallions with different movement and place supply (from the point of view of time restricted paddock stay; movement under the saddle) creates sufficient incentives for additional movement activities to meet the natural need of the stallions for movement. Whether the additional activity supply also has an influence on the well-being was another aim of our investigations.

Material and method

For the investigation period of 4 weeks, 12 animals were examined from the stallion stock of a stud farm. The horses were in three groups each with four stallions and to each allocated a differentiated movement and place supply offer (*Table 1*).

The warmblood stallions were between 4 and 23 years old. The animals were stabled in outdoor boxes. Under movement supply, the daily work under the saddle (one hour riding) or a time restricted stay on the paddock (four to five hours) is understood in this test.

Only two of the three groups (A and B) were worked daily. Two of the three groups (A and C) had an additional place offer (in the paddock) likewise.

The paddocks had an average size of 600 m^2. The measurements for the movement activity and for the resting/lying periods were carried out for all stallions with ALT pedometers. These were attached at the hindleg and the foreleg of the horses. The animal data were continuously recorded with a measuring time interval of 5 min over the complete test time.

Results

In the movement diagram of the individual stallions, clear differences in the activity be-

Table 1: Types of stallion housing investigated

Variants	n stallions	Accommodation	Riding	Paddock
A	4	single box 16 m^2	yes	yes
B	4	single box 16 m^2	yes	no
C	4	single box 16 m^2	no	yes

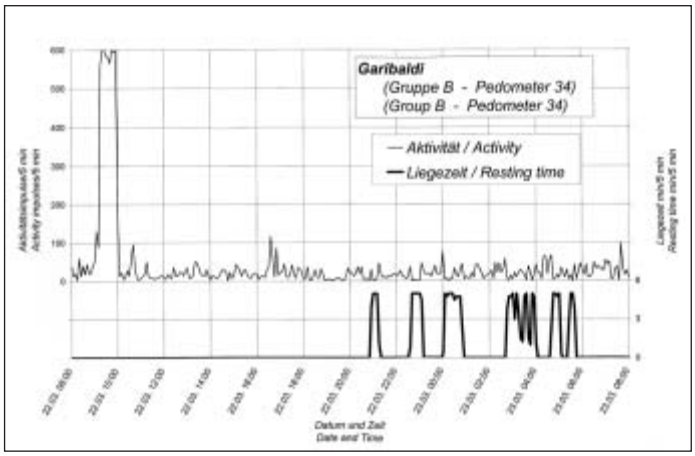

Fig. 1: Experimental variant B; riding/box housing

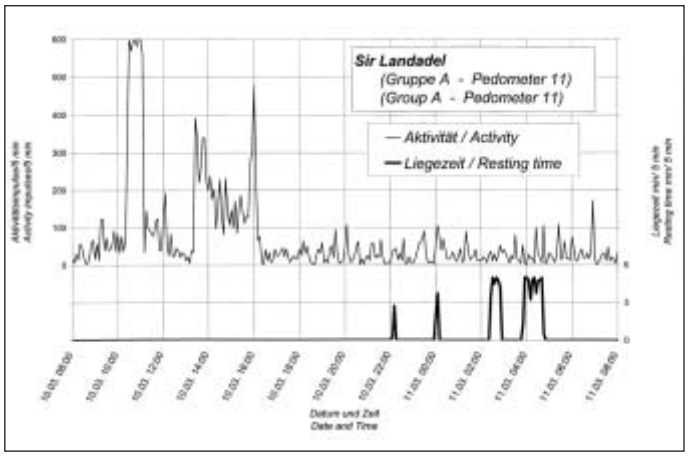

Fig. 2: Experimental variant A; riding and paddock stay/box housing

haviour for the different keeping systems of the activity curves of the examined variants can be seen. Riding represents itself with all examined animals as a steep, even curve. It reaches the maximum of 600 steps in the measuring time interval of 5 minutes and falls abruptly after at the return into the single box again and remains on a low level (*Fig. 1*). The average number of activity impulses in the measuring inte0rval of 5 minutes of all animals was 43.39 impulses/5 min.

Another activity curve shows variant C - box housing and paddock stay. The stay on the paddock has very big fluctuations in the activity between the different test-stallions. The remaining curve form shows the same low activity level as in the variants A and B (*Fig 1*). The stallions of the test - group A, riding and paddock stay – got the most intensive movement offers.

In *Fig. 2*, the courses of activity of both movement types can clearly be seen. The maximum of the movement activity (600 steps) was attained with riding for a longer time period. The free movement on the paddock is characterized by two peaks (circa 400 impulses) at the beginning and at the end of the paddock stay (the way out and back to stable). During the stay on the paddock they show a slow activity on a low level. Here are also the temperament and the age of the stallions are influencing factors. The low activity level in the box housing time is the similar to the results of the variants A and C. A close look at the standard deviation shows clearly that, besides the animal specific influence, the type of movement by riding or paddock stay has an influence. For the groups A and B a higher deviation from the mean value was observed than in group C (*Table 2*). By comparing multiple mean differences it can be demonstrated that the variants A : B and A : C show significant differences for the parameter movement activity. However, there was no significant difference between variants B : C. This shows that variants B and C (riding and paddock stay) have nearly the same activity volume (steps).

Variant A shows in comparison a much higher activity and is so well applicable for high requirements in a modern animal-friendly housing system. If you have a look at the lying time of the different variants, it can be stated that variant B (riding) with a mean lying time of 2.97 h/d has the longest lying time. In variant A (riding and paddock stay) the rest period of animals is only 1.47 h/d and in variant C (paddock stay) only 1.08 h/d. The intensive riding training of one hour a day seems to be more exhausting (untypical exercise) than the free stay in the paddock, clearly shown by the higher needs of the stallions.

Discussion and conclusions

The movement activity of the stallions in the different types of activity is increasing during the time of the paddock stay and during the riding time, compared to staying in the box. This was expected and corresponds with the results of other authors [3].

The testing group A (riding/paddock) shows the maximum daily activity of all variants. On the paddock, the stallions walked a lot around, too. In consequence, this shows that only one our riding per day is not enough daily activity for the stallions. During the stay in the box, there was only a low activity because of the small space in the box housing per animal.

The statistical analysis shows that group C (paddock) has same activity as the riding group. This result was not expected. It was expected that the paddock group would have a lower activity than the riding group under the saddle, because of missing stimuli. The opinion of [9] that horses stand only on vegetation-free paddocks, was not confirmed in our investigation. However, these investigations show that a vegetation-free paddock can help to reduce low walking activity of stallions in box housing. An additional activity of the horses in box housing on the paddock, or better on the pasture, is necessary to reduce physical diseases, psychical damages and behavioural disturbances of the horses.

Conclusions

The investigations confirm the results from other scientists that the activity of the horse depends on the offered possibility for movement. It can be concluded that the need for activity of the stallions cannot be satisfied with one hour working per day under the saddle. The additional possibility of free walking on the paddock is positive for the horse, also without additional activity stimuli, but it cannot compensate for grazing on the pasture.

Variants	Mean value	N	Standard deviation	min.	max.	Mean difference
A	9,69	21429	18,23	0	600	6,84* (A : B)
B	8,32	21396	17,17	0	600	8,16* (A : C)
C	8,06	22862	11,35	0	600	1,31 (B : C)

* The mean difference is signifcant on the level 0,05.

Table 2: Mean difference of movement activity (activity impulse/1 min) between variations A, B and C