Analysis of the daily biorhythm from horses, measured with ALT - pedometer in different horse keeping systems

S. Rose[*1]; U. Brehme[1]; U. Stollberg[1]; Yvonne Buchor[2]; R. v. Niederhäusern[2]*

[1]Institute of Agricultural Engineering Bornim, D-14469 Potsdam, Germany

[2] Haras National – stud-farm, 1580 AVENCHES, Switzerland

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Introduction

Advantages – of ALT pedomter measurement system

- a non invasive method for data measuring, the procedure is animal welfare and painless
- a measuring method for activity, lying time and environment temperature for horses in animal welfare and animal health
- excellent method for daily biorhythm from animals with continuously measuring from data in a free eligible time interval between 1…60 min for all parameters

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What is an ALT - pedometer?

definition from ALT – it is a synonymous for:

Activity - measuring from movement activity on the leg

Lying time – rest periods of the animal in two positions

Temperature - environmental temperature on the leg from the animal (help for assessment from animal welfare from lying boxes)

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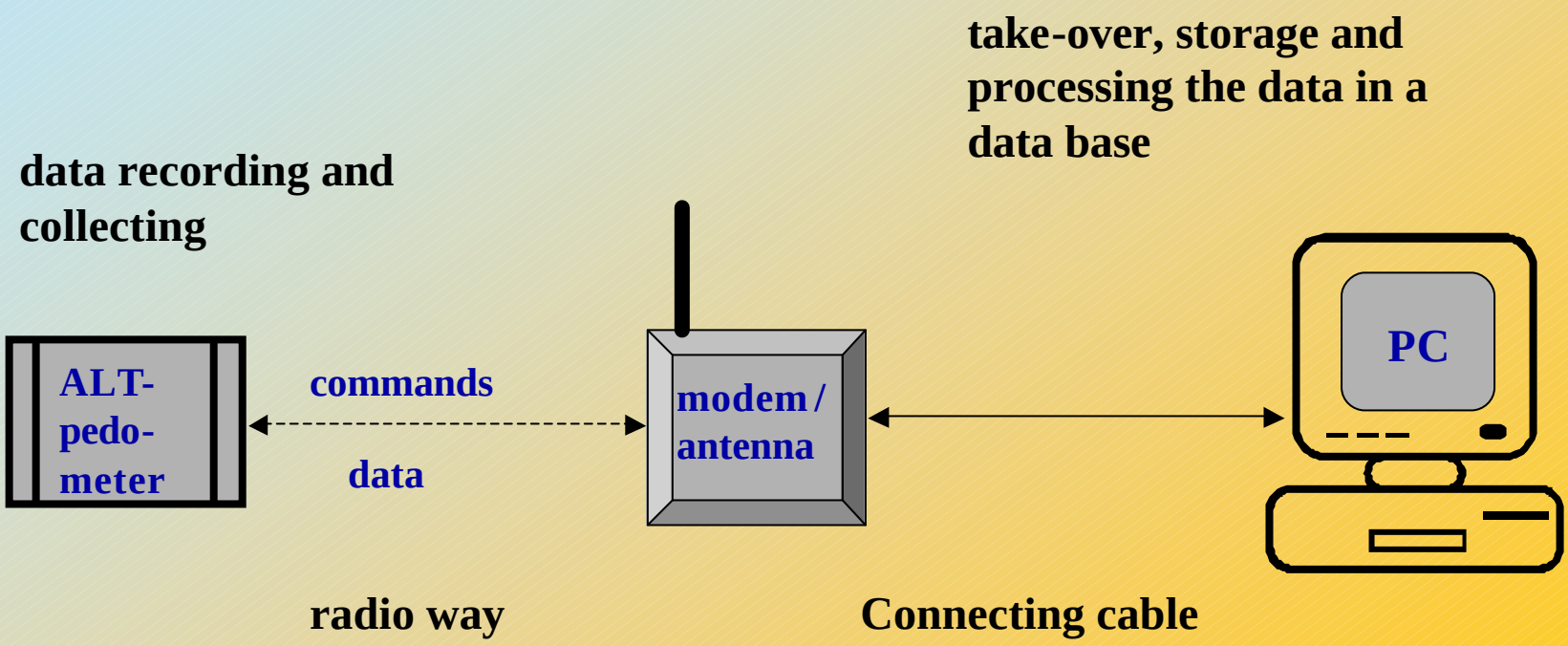
Schematic diagram from ALT-pedometer measurement system for animal data in horses



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ALT - pedometer – final stage 2005

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Problems / Tasks in Horse Keeping

Animal welfare in different horse keeping systems

- **Is there an influence from keeping system of the biorythm from horses ?**
- **What is the situation in daily biorhythm from horses in single inside boxes, boxes with run and on the pasture ?**
- **It´s possible to check with ALT - pedometer the gaits of horses in the training ?**

Examinations with horses

- **Examinations for relevance from physiological data for animal welfare and health (activity, lying time)**
- **Testing from different measurement systems - ALT pedometer and a hyppophon (for training check the gaits from horses)**

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Material / Methods

Measurement methods

1. **ALT - pedometer for measuring the daily biorhythm from horses in single inside boxes, boxes, boxes with run and on the pasture**
2. **Testing a „Hyppophon“ - acustic sensor aided system for gaits from horses (no results introduce)**

Measurement parameter

for 1) movement activity, lying time, environment temperature

for 2) gaits - steps, trot and galop (no results introduce)

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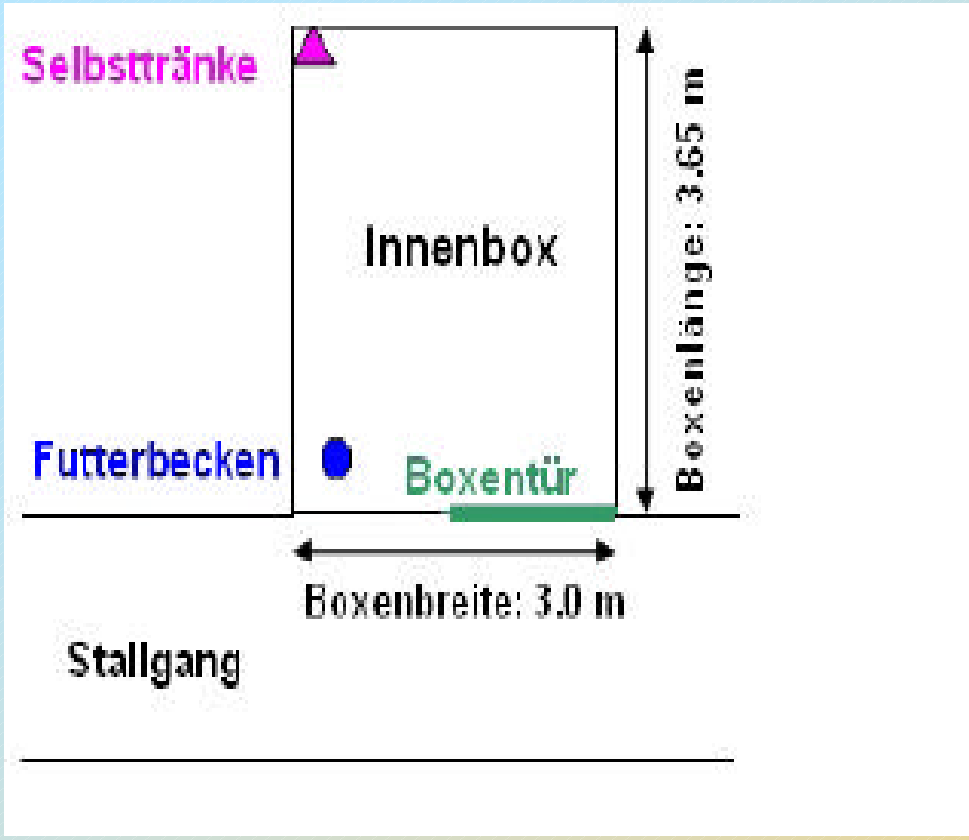

Stallion in single inside box

Fig. 1: Horse keeping systems – single inside box

box dimension : box breadth = 3 m,

box length = 3,65 m

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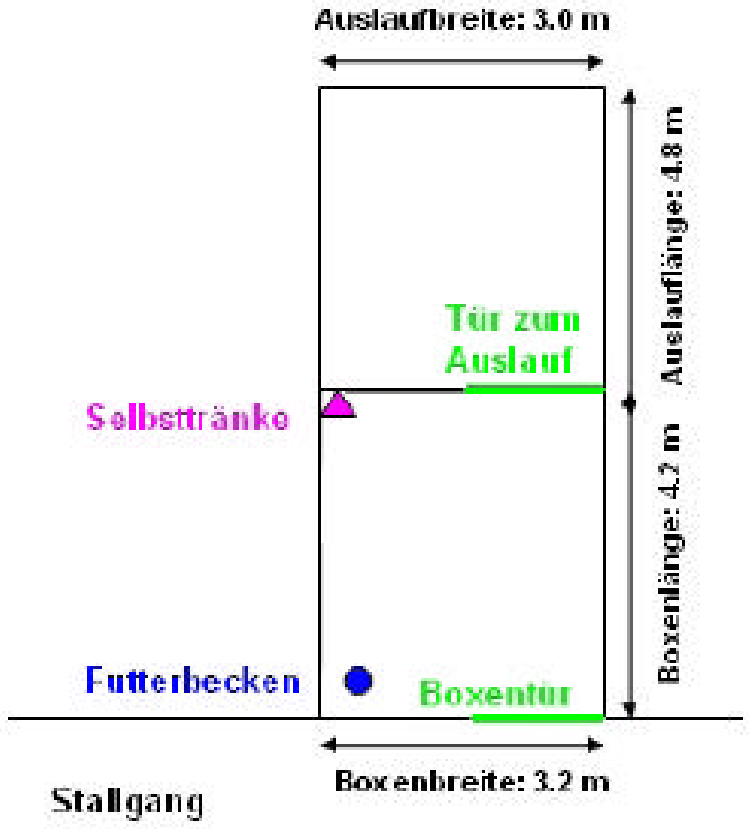

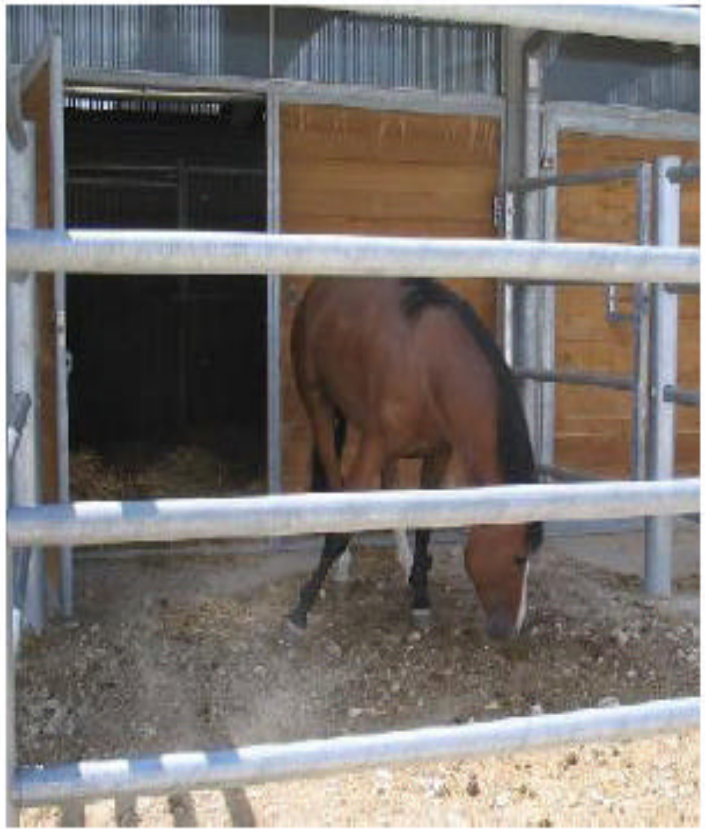

Stallion in the run

Fig. 2: Single box with run : dimension

box breadth = 3,20 m, box length = 4,20 m,

run breadth 3,20 m, run length 4,80 m

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Stallion with ALT – pedometer on the pasture

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First Results

Examinations with ALT -pedometer

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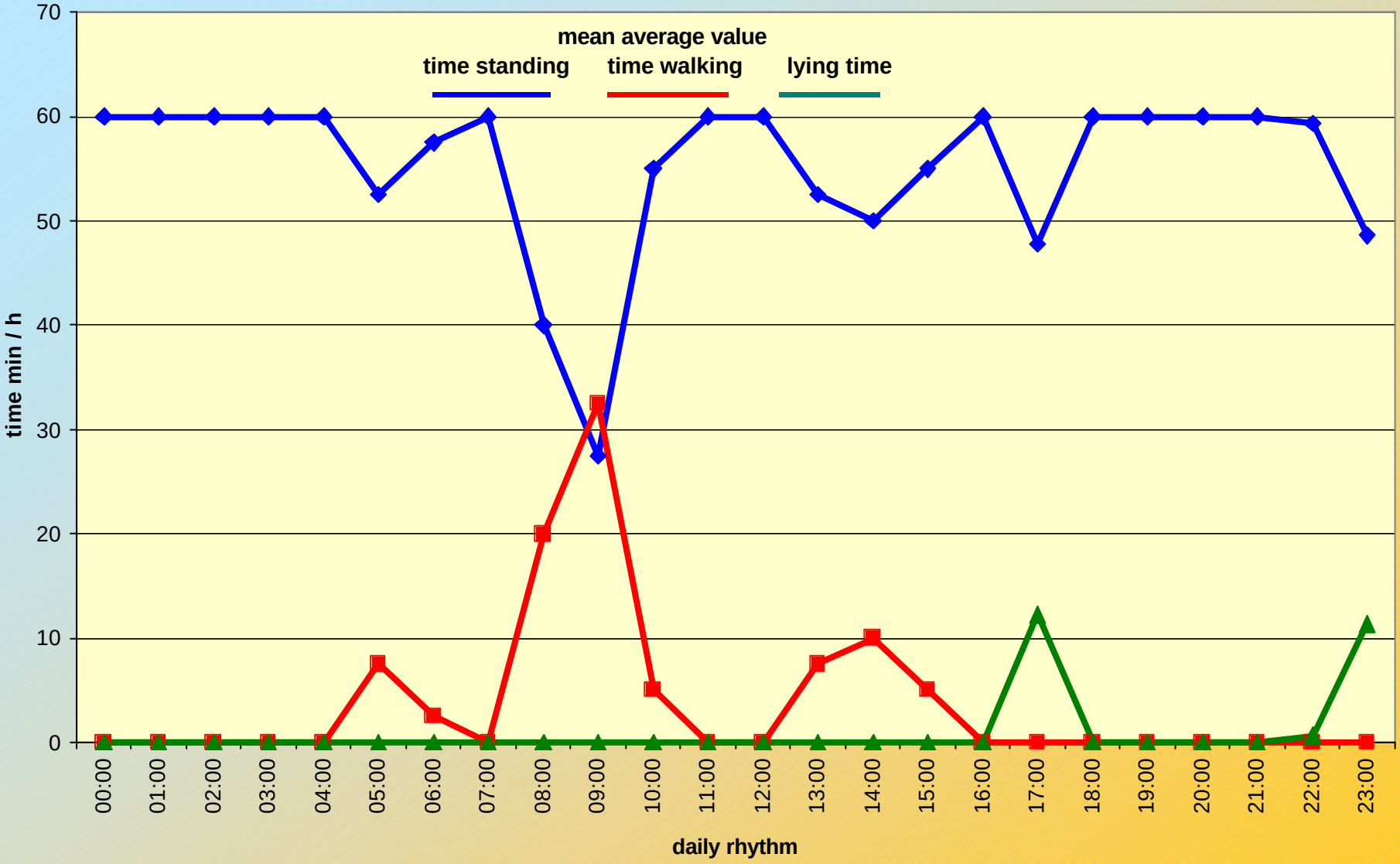

Fig. 3 : „Kogani“ daily biorhythm – single inside box

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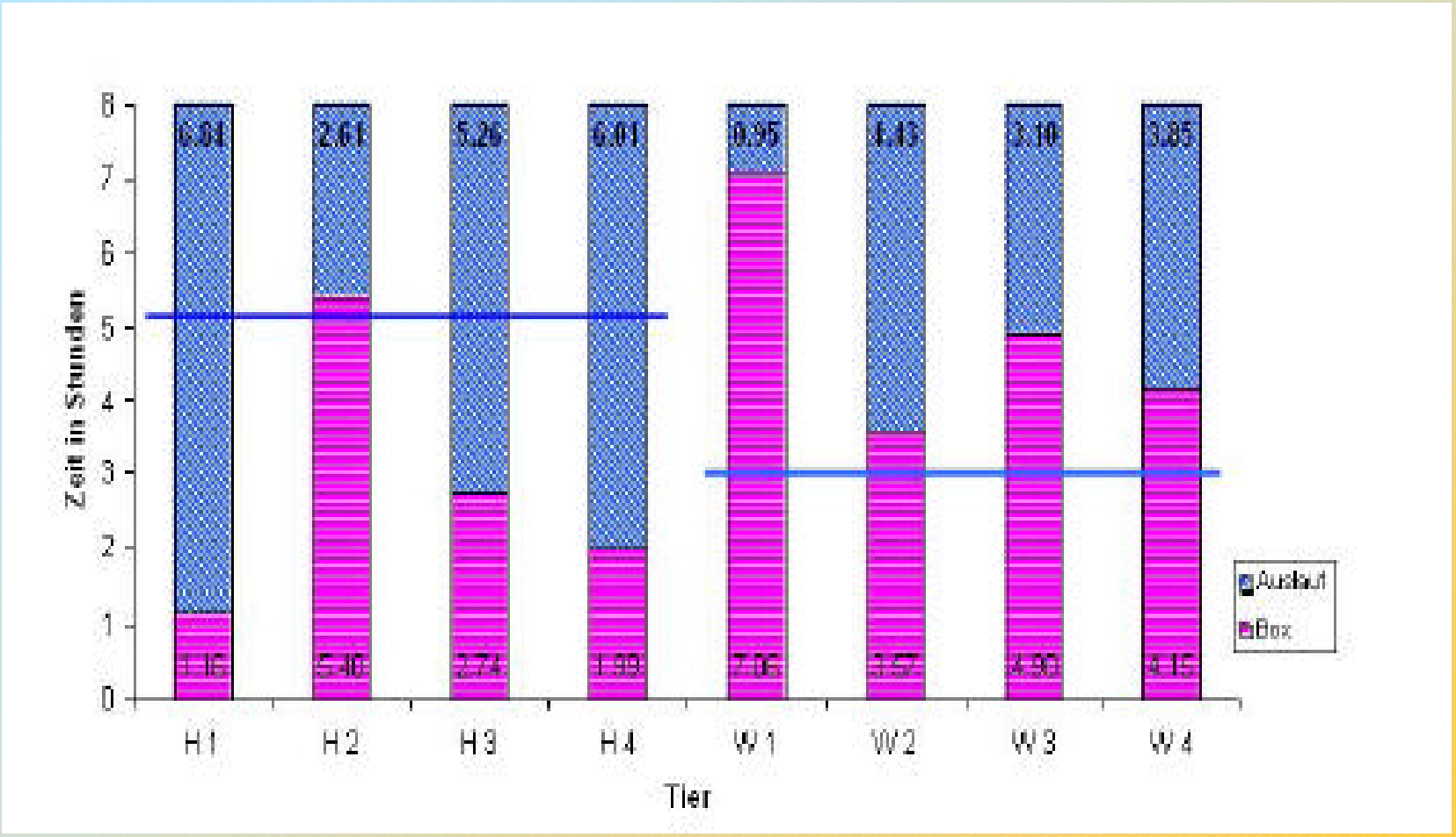

Fig 4 : Length of stay - between stallions and geldings in boxes with run

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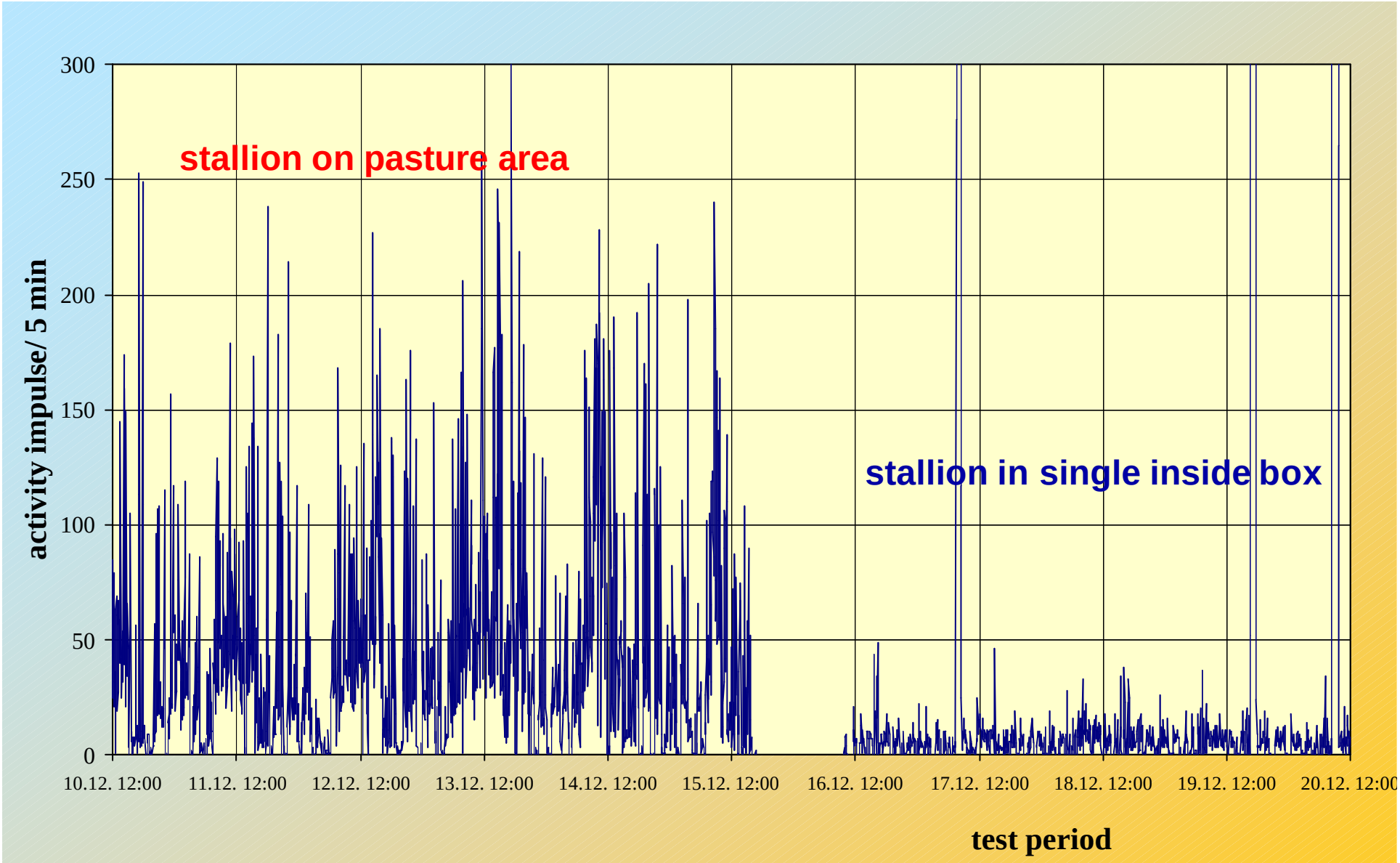

Fig. 5 : Comparision - activity on pasture and single inside box from a stallion

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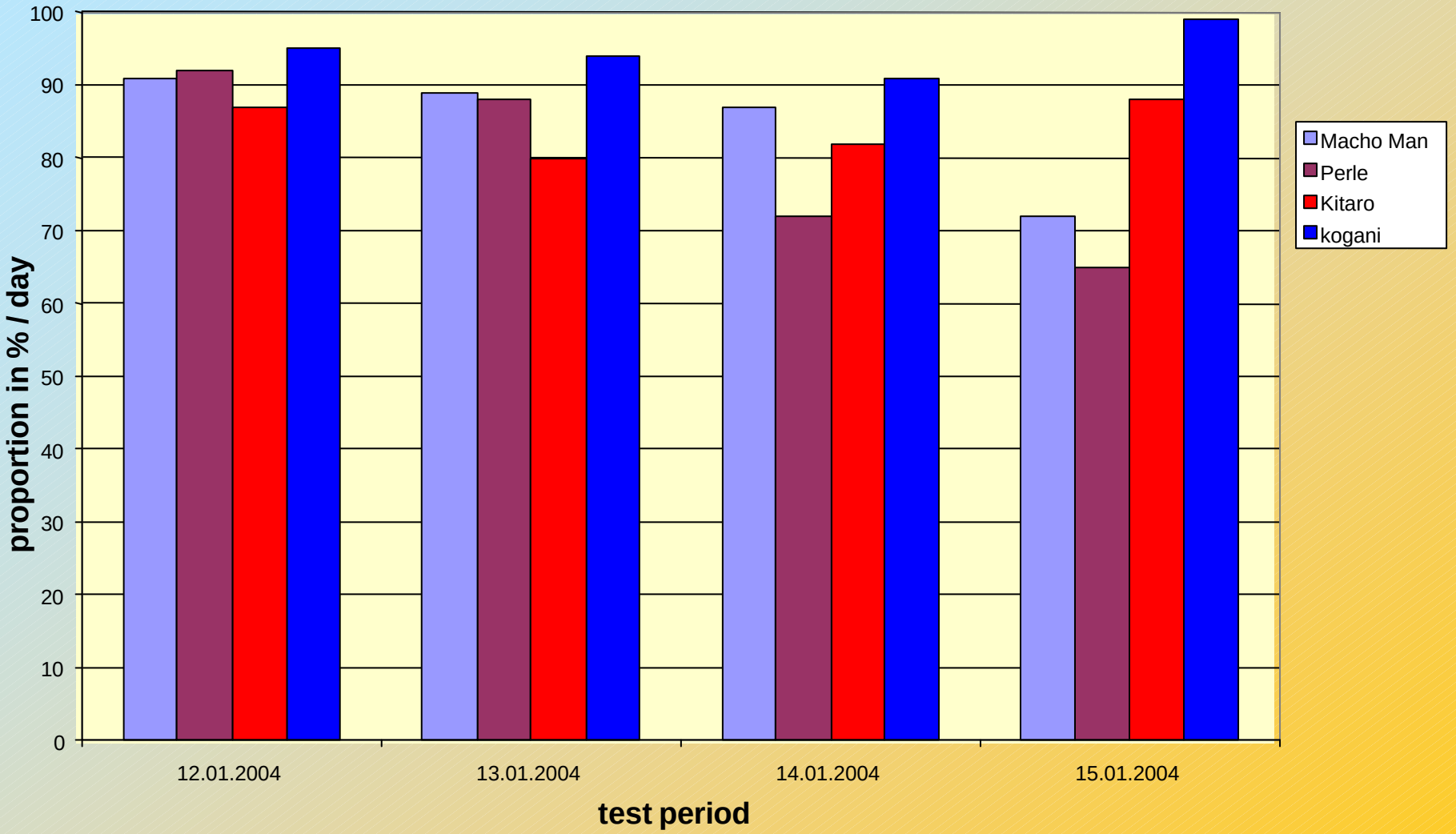

Fig. 6 : Results from all horses – „standing“ in the test period – in % per /day

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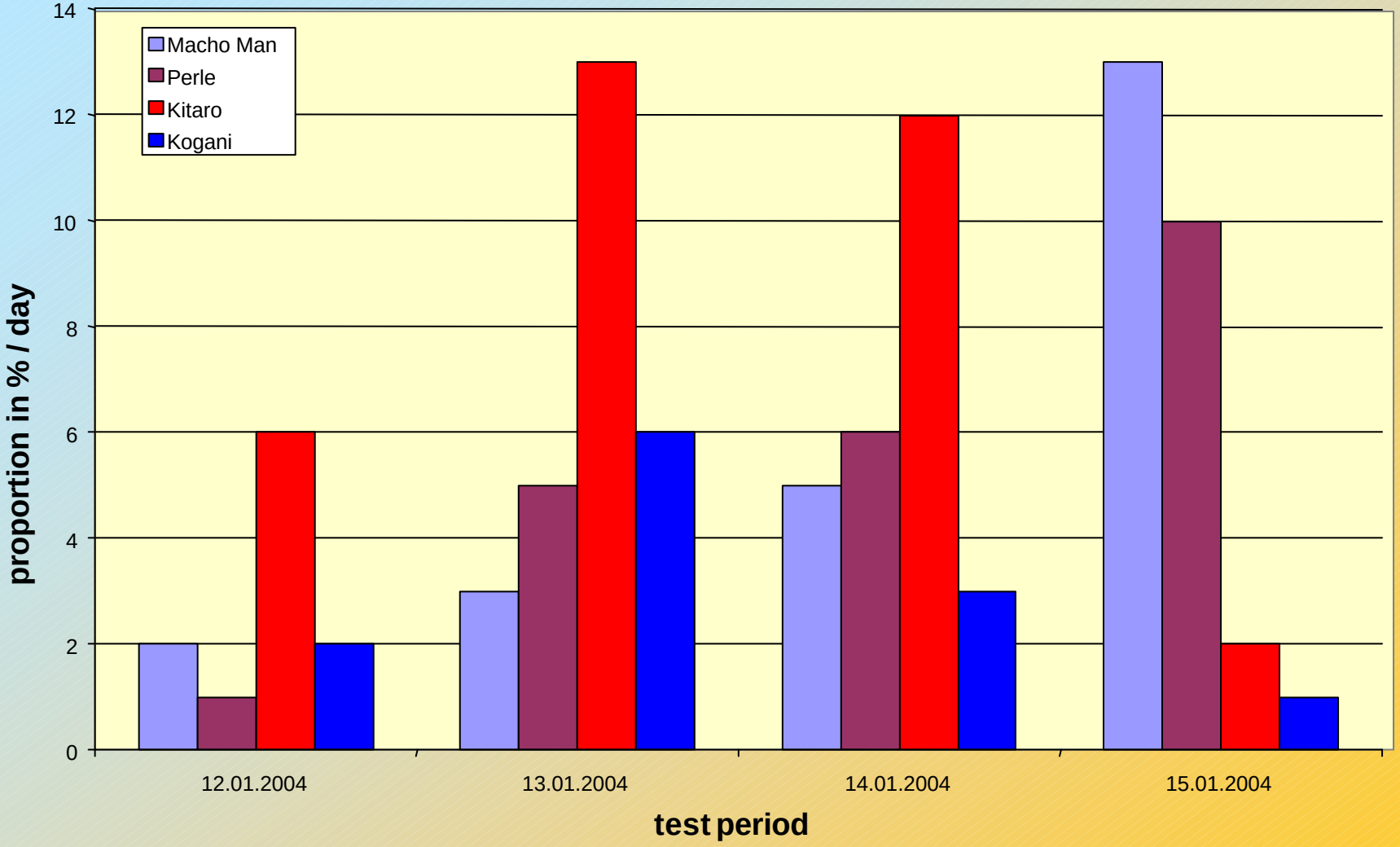

Fig. 7 : Results from all horses – „walking“ in the test period – proportion in % / day

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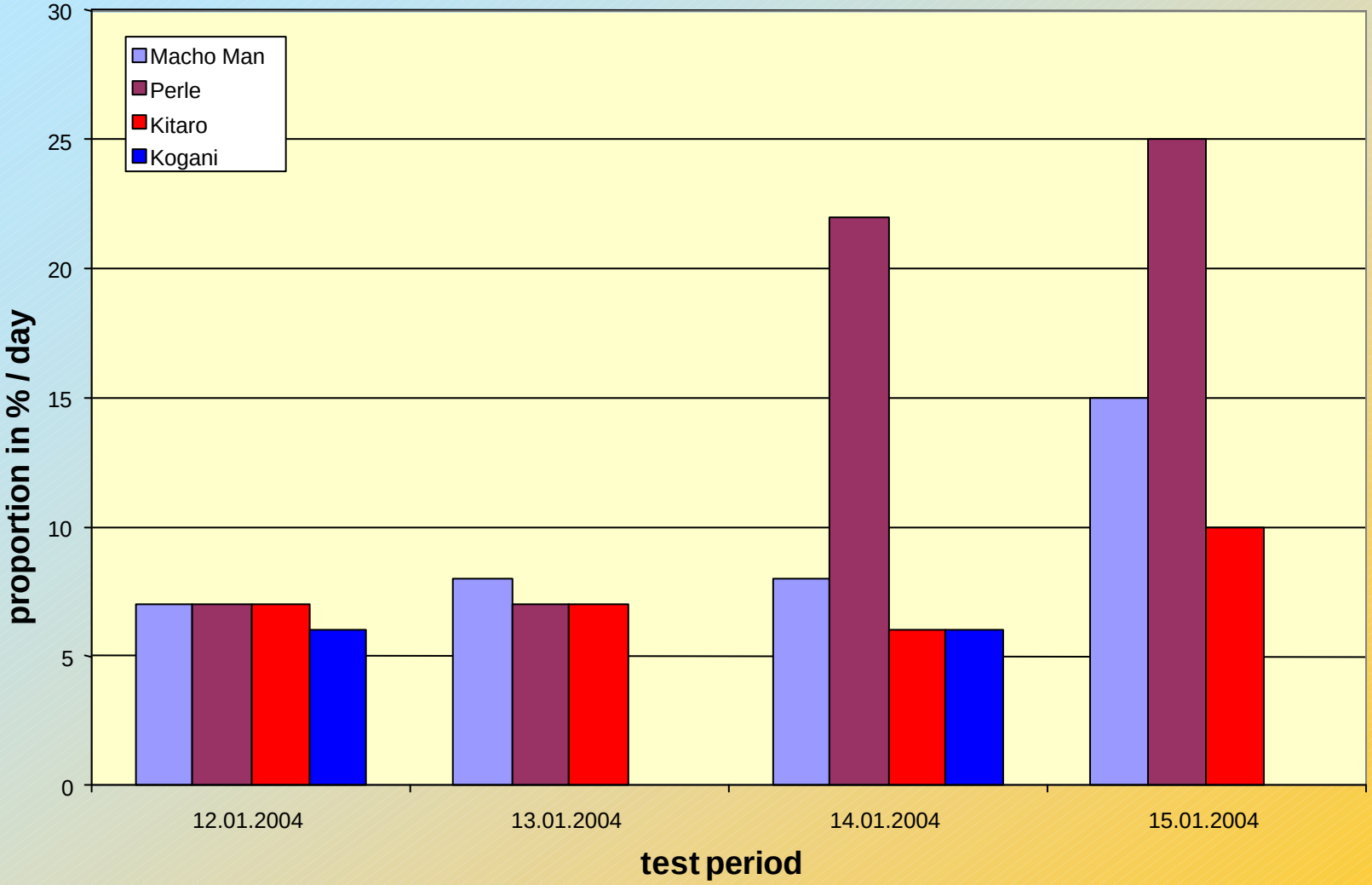

Fig. 8 : Results from all horses – „lying time“ in the test period – proportion in % / day

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- we find out – that the horse keeping system have a great influence of the daily biorhythm, of animal welfar and for animal health.
- the movement activity from horses in inside boxes and boxes with run should have a dimension from more then 12 m^2 for good conditions in ainmal welfare and animal health.
- in single inside boxes horses are only „standing“ between 80 and 90 % of the day, the everage „walking time“ was 6 to 10 % of the time per day, and the everage „lying time“ is 5 %. (show Fig. 3)
- in boxes with run the results are better – stallions were 65 % in the run, geldings only 38 %, in this time they have different activities, the „walking time“ is near 20% and the everage „lying time“ is 5 % too (show Fig.4)
- ideal condition for horse keeping system isthe living on pasture – the activity impulse, the degree for moving and walking of horses, was 110 to 130 on pasture and 10 to 13 in a 5 min interval in inside boxes (show Fig. 5)
- examinations have shown that lack of activity from horses can cause a whole row of illnesses and most different behavioral disorders

Conclusions

ALT – pedometer – are an excellent animal measurement system for practical use and satisfy the following conditions:

- **continuous measurement from animals data, sensor-supported selectable time interval (1…60 min)**
- **high measurement density, reusable, long-life, reliable**
- **direct data transfer from animal body to PC**
- **easy to handle, low-cost**
- **give exact results for daily biorhythm from horses**
- **helpful to decisions in the judgement of animal welfare of horse keeping systems**
- **It´s not possible to check with ALT - pedometer the gaits of horses. These measurement system can not change his impulse frequency for measuring different speed impulse**

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