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Influence of husbandry and feeding management on welfare and stress of horses

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Problems



- Most German horses are stabled
 - in single boxes or
 - in group housing systems with non-divided lying areas
- Inactivity of horses causes physical and mental diseases
- Concentrate feeding: long waiting times (e.g. long stable alleys) can cause stress

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Aim of this studies



- Find out possibilities to reduce stress by stable-housed horses
 - by creating a better housing system
 - by the opportunity of additional movement possibilities
 - by a better feeding management

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Horses



- 2 – 3 year old warmblooded mares from the Hanoverian Breed
- 24 horses / investigation (4 groups, 6 horses in each group)
- Every horse in each examination variant, respectively



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Aerial view of the research stable and horse walker



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Husbandry system



- Group husbandry system with paddock (270 m²)
- 6 horses
- Single (double) husbandry system with paddocks
- 6 horses

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Measuring heart rate variability



- Sensor for measuring heart-rate-frequency
 - Intervals between the beats
- Software (HRV Analysis) for interpretation of stress load with different parameters



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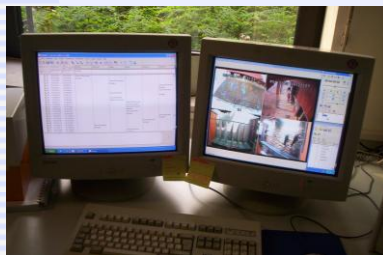
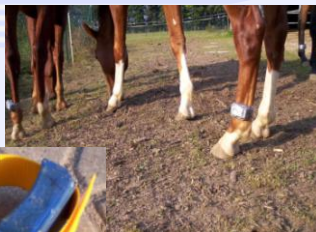
Determination of cortisol metabolites in faeces of horses



- Stress causes an increased cortisol level
- Cortisol metabolites also carried out with the faeces (24 h after release from adrenal cortex)
- Method for non-invasive analyzing of stress (ELISA)

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Behavioural observation



- **ALT-Pedometer**
(Activity, Lying time, Temperature at the leg)
- Additionell behaviour analyzing by video technique

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Investigation I

Different housing systems (method)



- 6 variants:
 - Single box without paddock
 - Single box with close-by paddock
 - Two horses share two boxes with one close-by paddock
 - Group housing (6 horses together in a multi-room yards husbandry facility) with
 - a non-divided lying area
 - a dividing wall at the left side (exterior wall)
 - a dividing wall on the right side (stable alley)

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Investigation I

Different housing systems (results)



- Stress-Level (from low to high):
 - Group husbandry with non-divided lying area
 - Group husbandry with divided area
(no significant difference between wall on the left or right side)
 - Single box with freely accessible paddock
 - Single box without paddock
 - Two shared boxes and one attached paddock
- But many inter-individual differences

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Investigation II

Different opportunities to move (method)



➤ 5 variants:

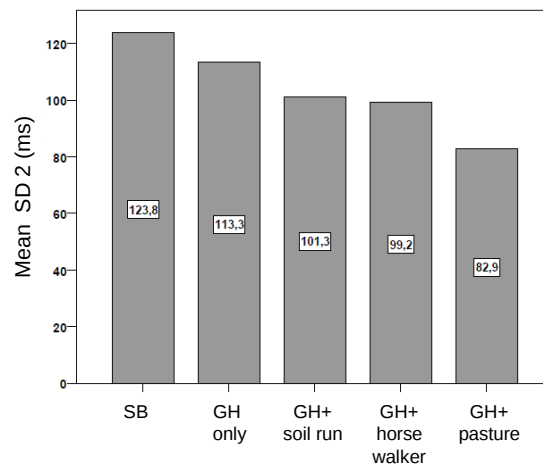
- Single box with close-by paddock but no additional movement outside the stable (SB)
- Group housing (6 horses together) with
 - close-by paddock but no additional movement outside the stable (GH only)
 - with 2 h pasture / day (GH+pasture)
 - with 2 h on a non-grassy soil run / day (GH+soil run)
 - with 1 h movement in a horse walker / day (GH+horse walker)



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Investigation II

Different opportunities to move (results)



➤ Additional movement possibilities like pasture or horse walker have positive influences on welfare

Higher stress exposure leads to higher SD2 values

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Investigation III

Concentrate feeding techniques (method)



Different kinds of concentrate feeding techniques:

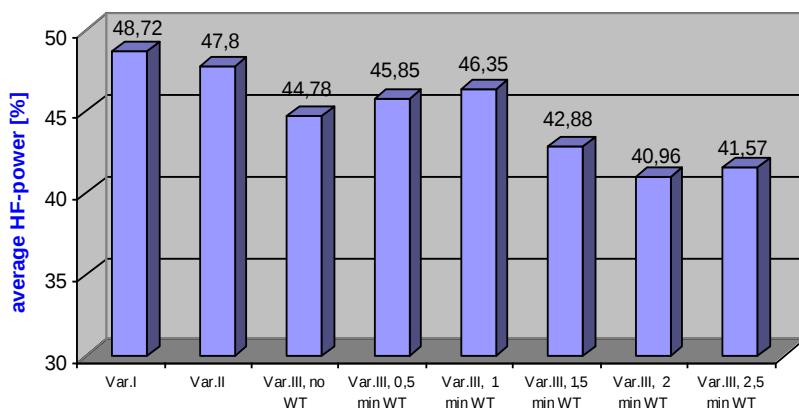
- Variant I: 10 x daily, automatic dosing feeder, simultaneous
- Variant II: 3 x daily, automatic dosing feeder, simultaneous
- Variant III: 3 x daily, manual concentrate feeding, time-shift from horse to horse
Waiting time: 0; 0.5; 1; 1.5; 2; 2.5 min



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Investigation III

Concentrate feeding techniques (results)



Higher HF-power equates stress decrease

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Conclusions



- Group housing of horses is a very horse friendly system with lowest stress levels
- Management is very important to see the individual requirements of every horse
- If there is a solid hierarchy in the group and enough space, it is not absolutely necessary to divide the lying area
- Additional movement opportunities, e.g. pasture or horse walker, are necessary (also for group housed horses) to encourage the physical and mental health
- Manual feeding induced highest stress values and longer waiting periods can result in a higher stress load

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Many thanks for your attention!



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