

Simulator training in equestrian show jumping

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Simulator-based training

- Flight simulators for training of air pilots
- Simulators-based skills training in medicine
- Riding simulators for teaching seat of the rider, and for reconvalescent riders or riders with handicap
- First riding simulator at the *ENE Saumur* in 1987 for research and training



Simulator-based training

- New riding simulators for show jumping, dressage, polo and racing have recently become available
- Interactive and controlled by leg and rein pressure.
- Independent moving head, neck and body imitate reaction of the horse to actions of the rider
- “Jumps” obstacles viewed on an interactive screen

Show jumping simulator
(Racewood, UK)





Aims of the study

- Analyse the physical effort of riders on a jumping simulator vs jumping a course of obstacles on a horse
- Analyse the stress response of riders on a jumping simulator vs jumping with a horse

Hypothesis

A jumping simulator elicits a near identical physical effort in riders but a lower stress response than jumping a horse

Material and methods

Riders

12 trainees of the Brandenburg State Stud
(6 female, 21.5±1.4 yrs old, 6 male, 19.8±2.2 yrs old)

Horses

6 geldings of the Brandenburg State Stud Riding School

Simulator

Racewood Show Jumping



Material and methods

Tasks on the horse (Brandenburg State Stud)

Warm up phase (5 min walk, 3 min trot, 3 min canter)

2 test jumps

Jumping course with 8 obstacles (90 cm height)

Tasks on the simulator (Equitana Equestrian Fair)

Warm up phase

One test jump

Jumping course with 13 obstacles

- Parameters determined**
- Heart rate
 - Heart rate variability
 - Cortisol in saliva

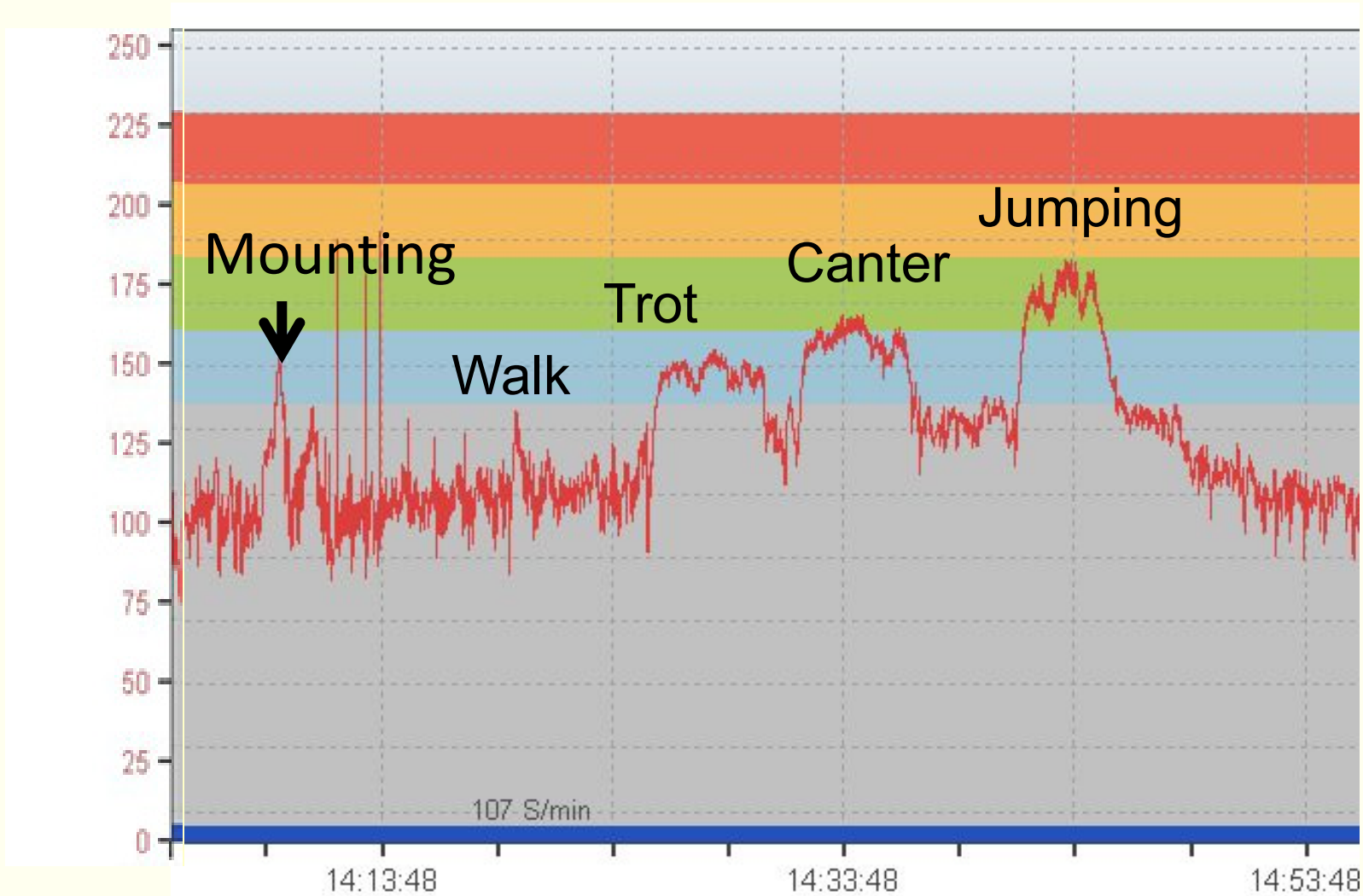
Heart rate variability (HRV)

= Short-term changes in heart rate

- Balance between sympathetic and parasympathetic effect of the autonomous nervous system on the heart
- Parasympathicus („relaxation“) → HRV ↑
- Sympathicus activated by stressors → HRV ↓

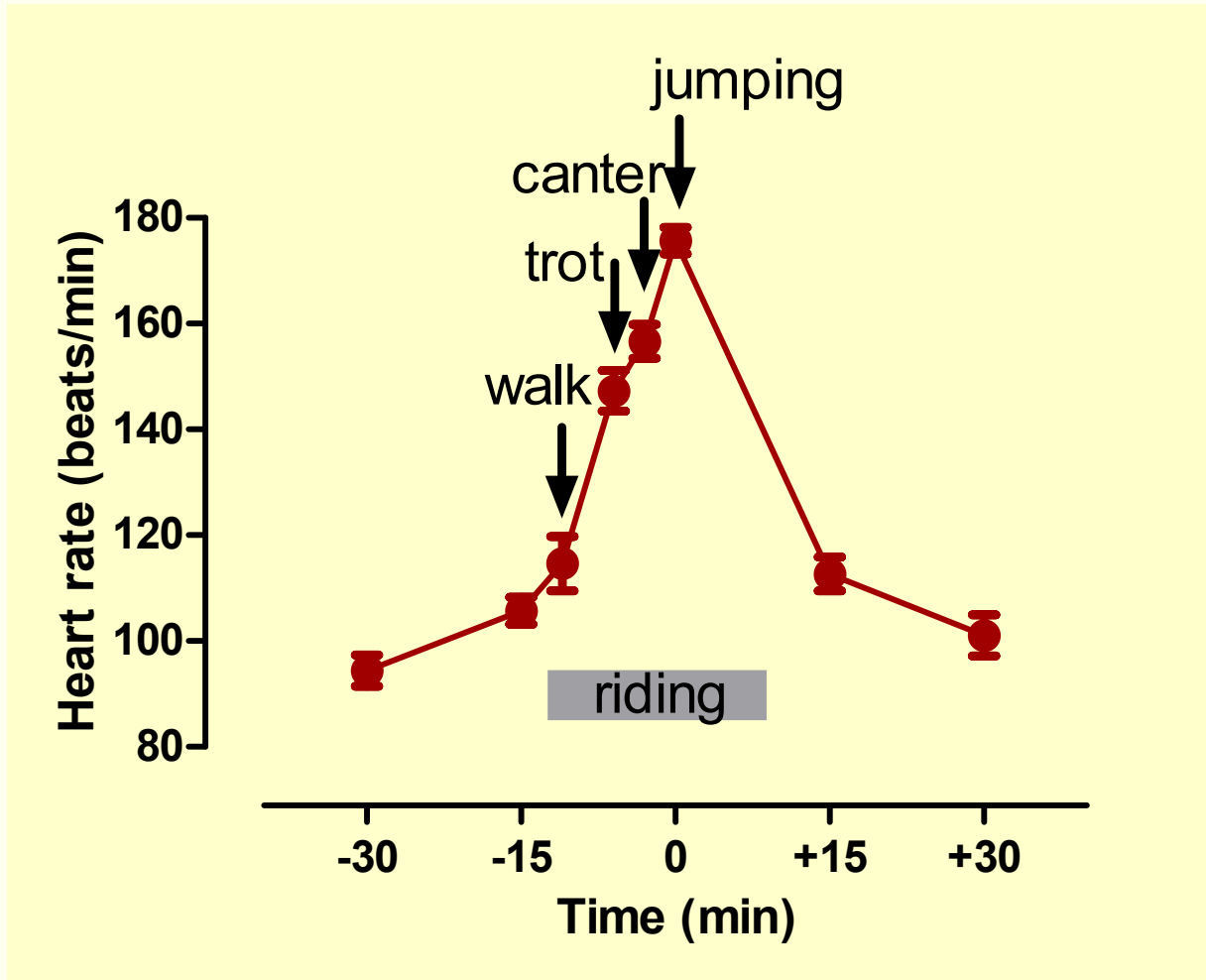


Results – Heart rate



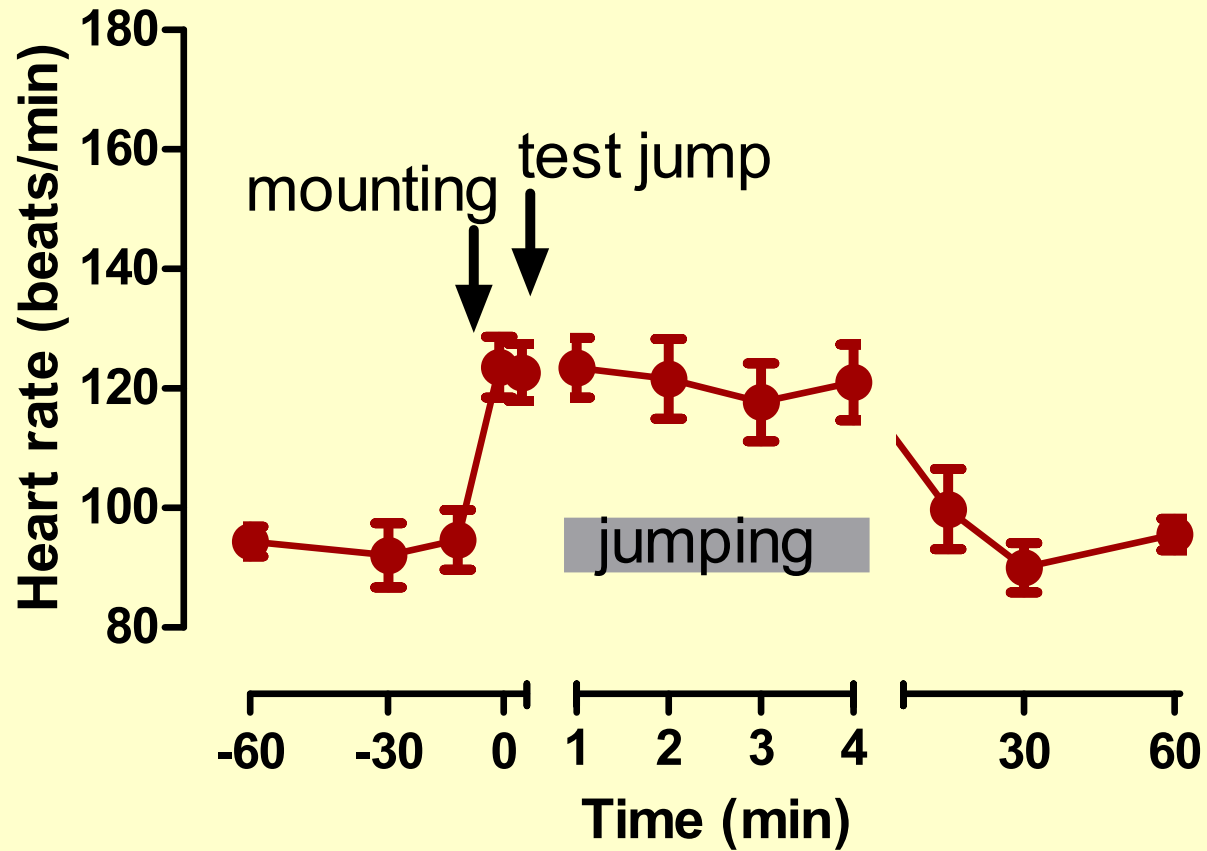
Heart rate in an individual rider on a horse

Results – Heart rate



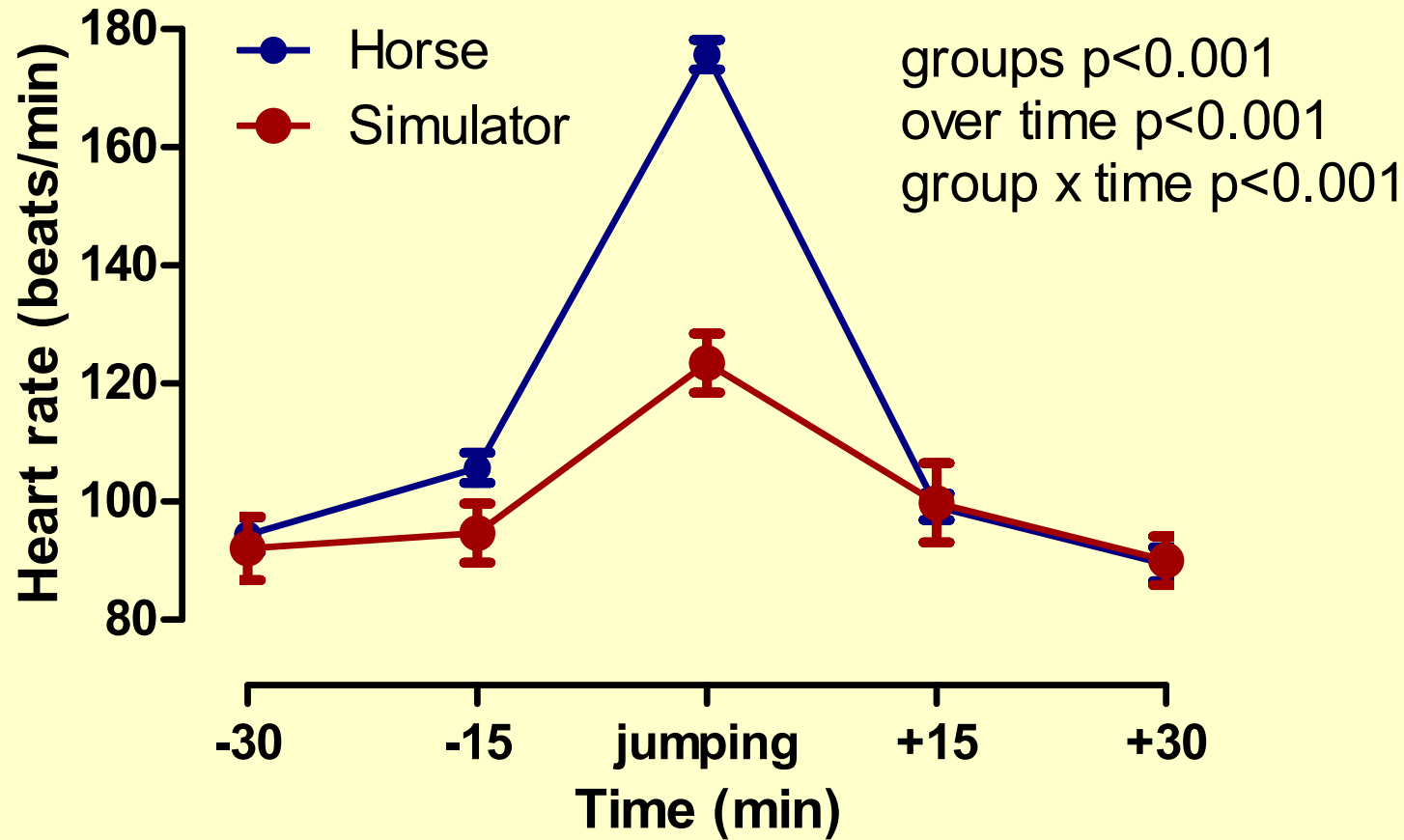
Heart rate in riders (n=12) on a horse

Results – Heart rate



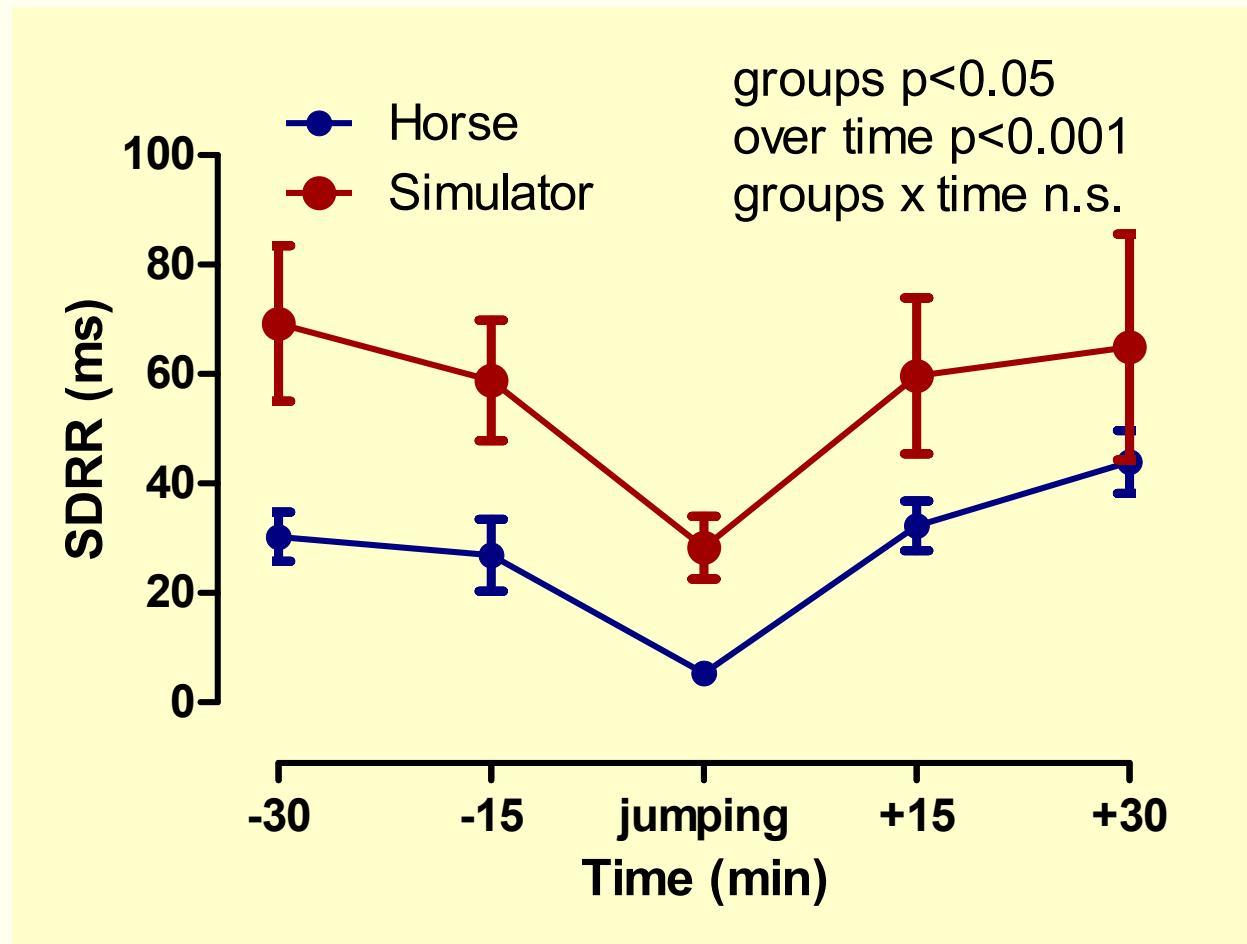
Heart rate in riders (n=12) on the simulator

Results – Heart rate



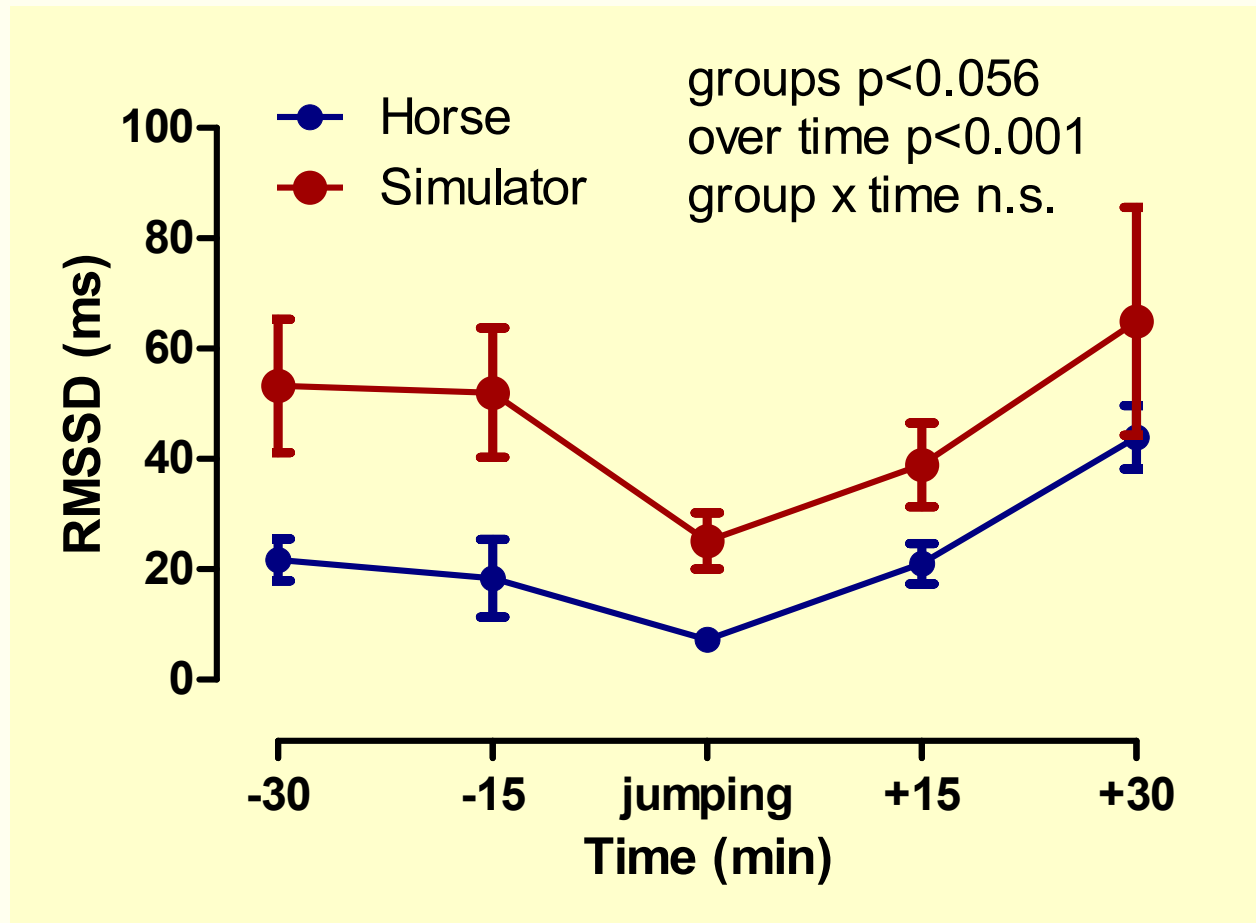
Heart rate in riders (n=12) jumping with a horse and on a riding simulator

Results – Heart rate variability



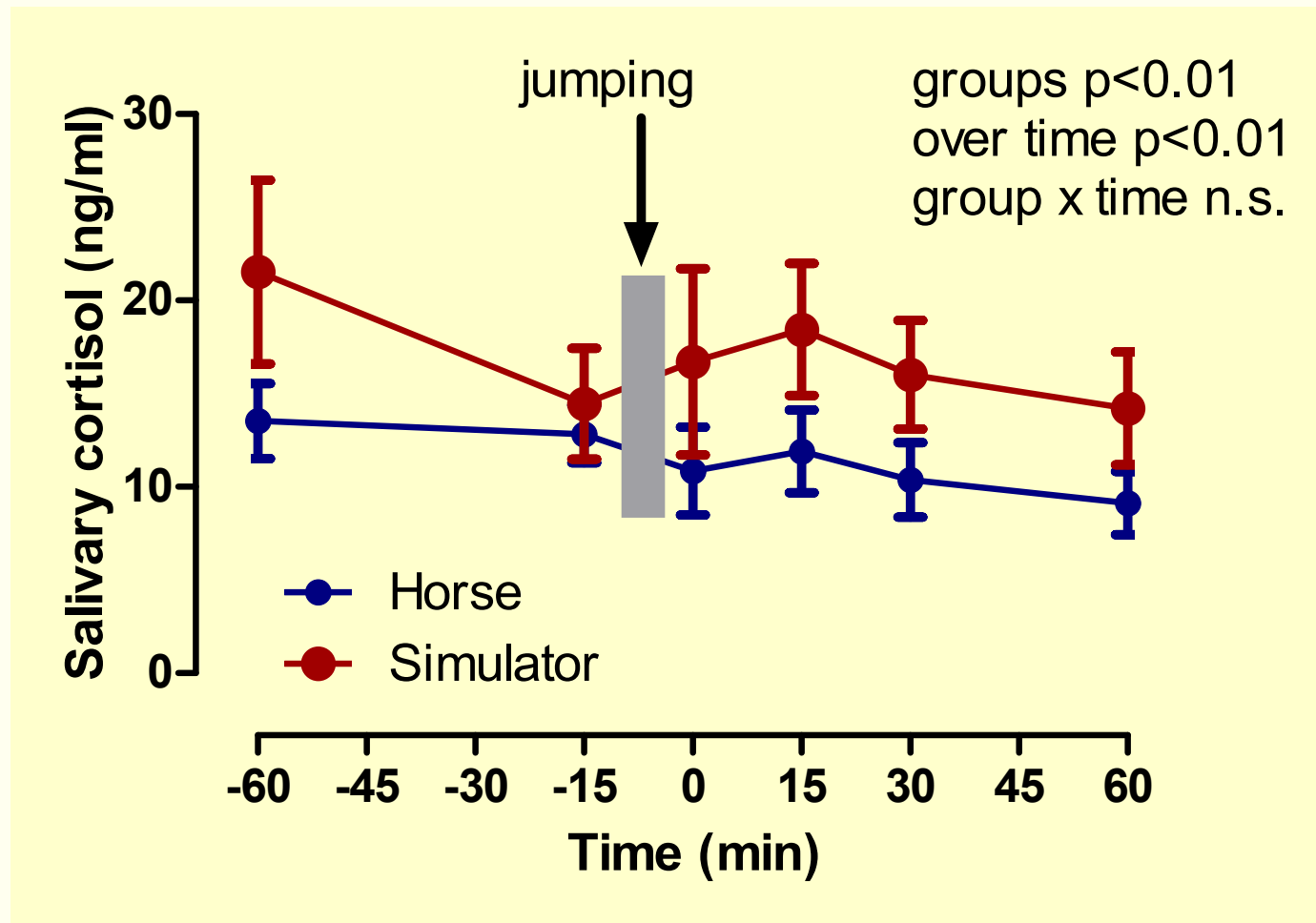
Heart rate variability (SDRR) in riders (n=12)
jumping with a horse and on a riding simulator

Results – Heart rate variability



Heart rate variability (RMSSD) in riders (n=12) jumping with a horse and on a riding simulator

Results – Cortisol



Cortisol in saliva of riders (n=12) jumping with a horse and on a riding simulator

Summary and conclusions

- Despite a „longer“ jumping course on the simulator heart rate of riders was higher when riding a horse
- *Simulator may allow to train movement patterns on a horse but physical demands are higher on horses vs. simulators*
- Lower HRV of riders on horses vs. simulators
- *Situation on the horse is more complex and associated with higher sympathetic activity of the rider*
- Higher cortisol release on the day of simulator training due to the specific test situation for the riders

Thank you for your attention

