

Evaluation of heart rate and lying behaviour to predict calving of dairy cows

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Outline

- Context of calving
- Goals
- Experimental design
- Results
- Conclusions

Context

Calving categories	Calving percent in category		Calf mortality (%) within 48 hours	
	Heifers	Cows	Heifers	Cows
Unassisted	45	79	8	6
Easy pull	30	15	10	8
Hard pull	14	3	35	24
Jack needed	7	1	55	66
Veterinarian	4	1	48	65
Total	100	100	17	8

Source: North Carolina State University

Context



Economic aspects

- Animal health
- Loss

Herdmanagement

- Herd size
- Labour

Welfare

- Mortality
- Health

Goals

Evaluation of non-invasive methods to predict calving

- Heartrate
- Activity
- Lying behaviour

Recording parallel to a completely monitored calving as first approach

Experimental design



Seperate experimental calving barn
Section of 12 cubicles as holding area

15 single calving pens

26 cows

- 15 heifers
- 11 cows

Experimental design



Monitoring of cows (check) every 3 hours

Constant service hours (even on weekends)

„Backup“ of overall behaviour by video observation

Measuring of rectal temperature twice/d

Roughage feeding (MR) once/d

Concentrate feeding two times/d manually

Material & Methods – Activity and lying behaviour



ALT-Pedometer

Storage capacity (internal) 736 records

Storage interval 5 min with sampling of lying/standing, activity and position every 15 s

Radio transmission of internal data every 4 hours

Overall storage of records in a relational data base system (MS-Access)

Pedometers fixed at left foreleg

Material & Methods - Heart rate measurement



Polar® heartrate monitors S 810i

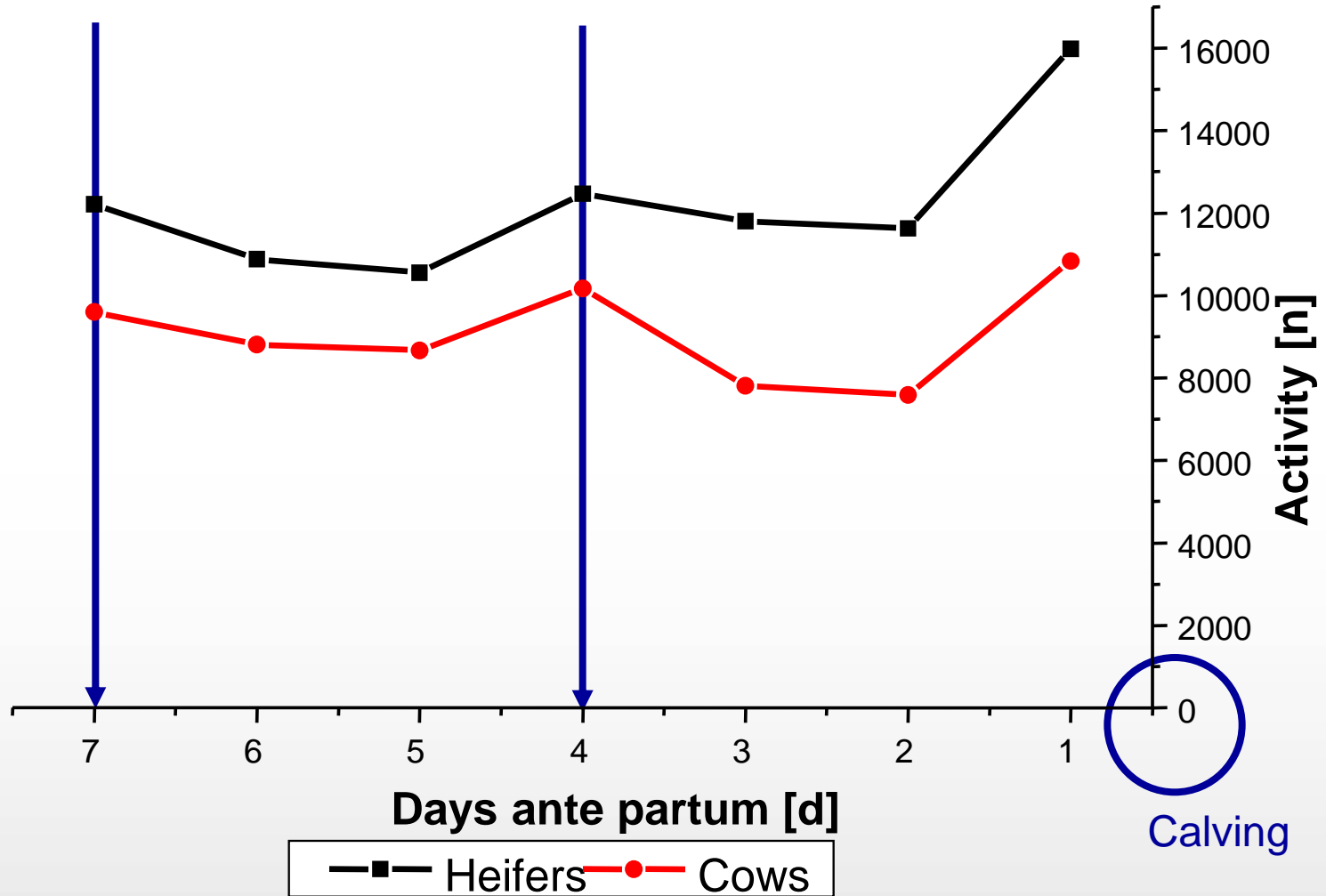
Polar® equine software & Kubios

5 s interval

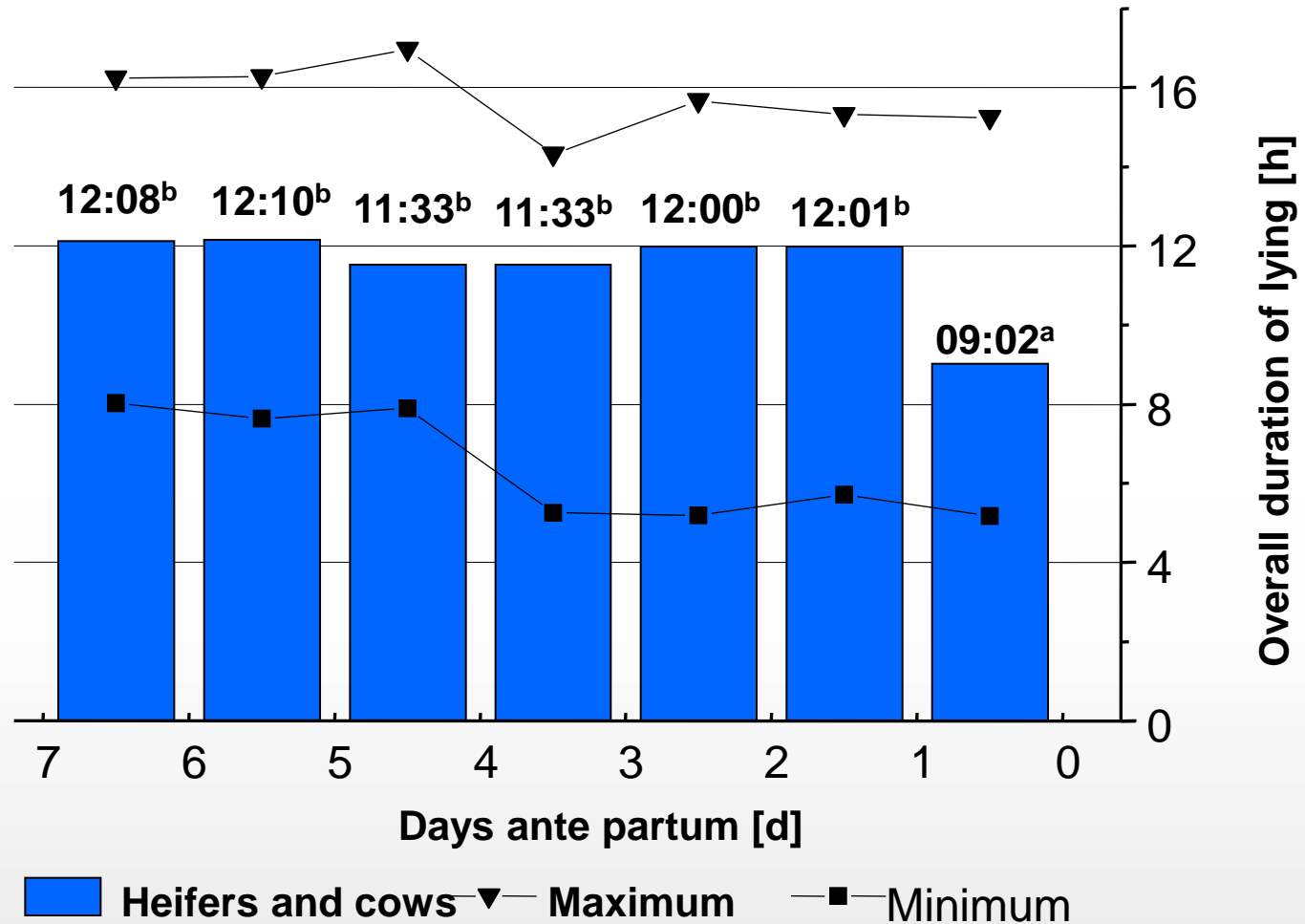
Electrodes wettened every 3 – 4 hours



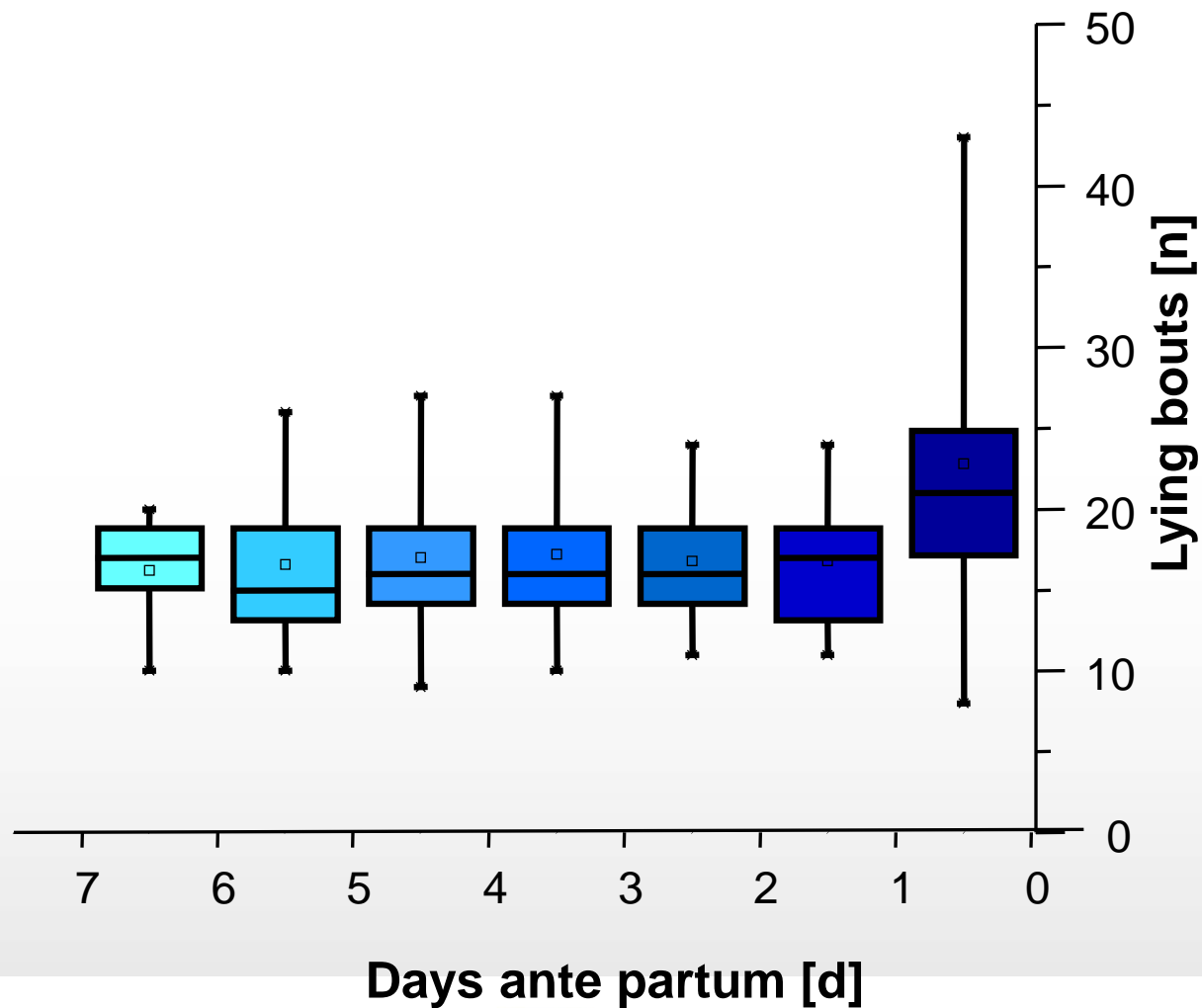
Results - Activity



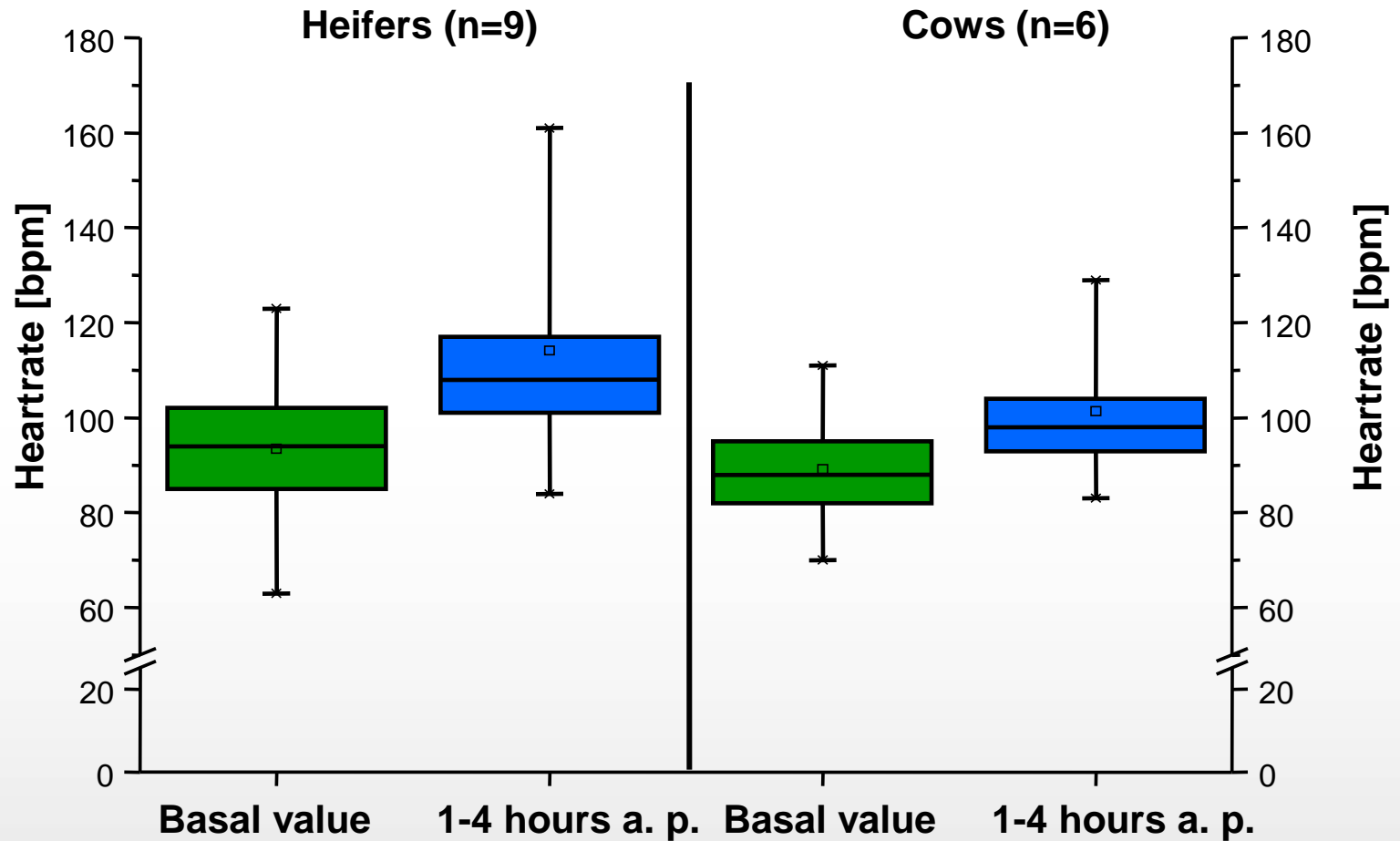
Results – Overall lying behaviour



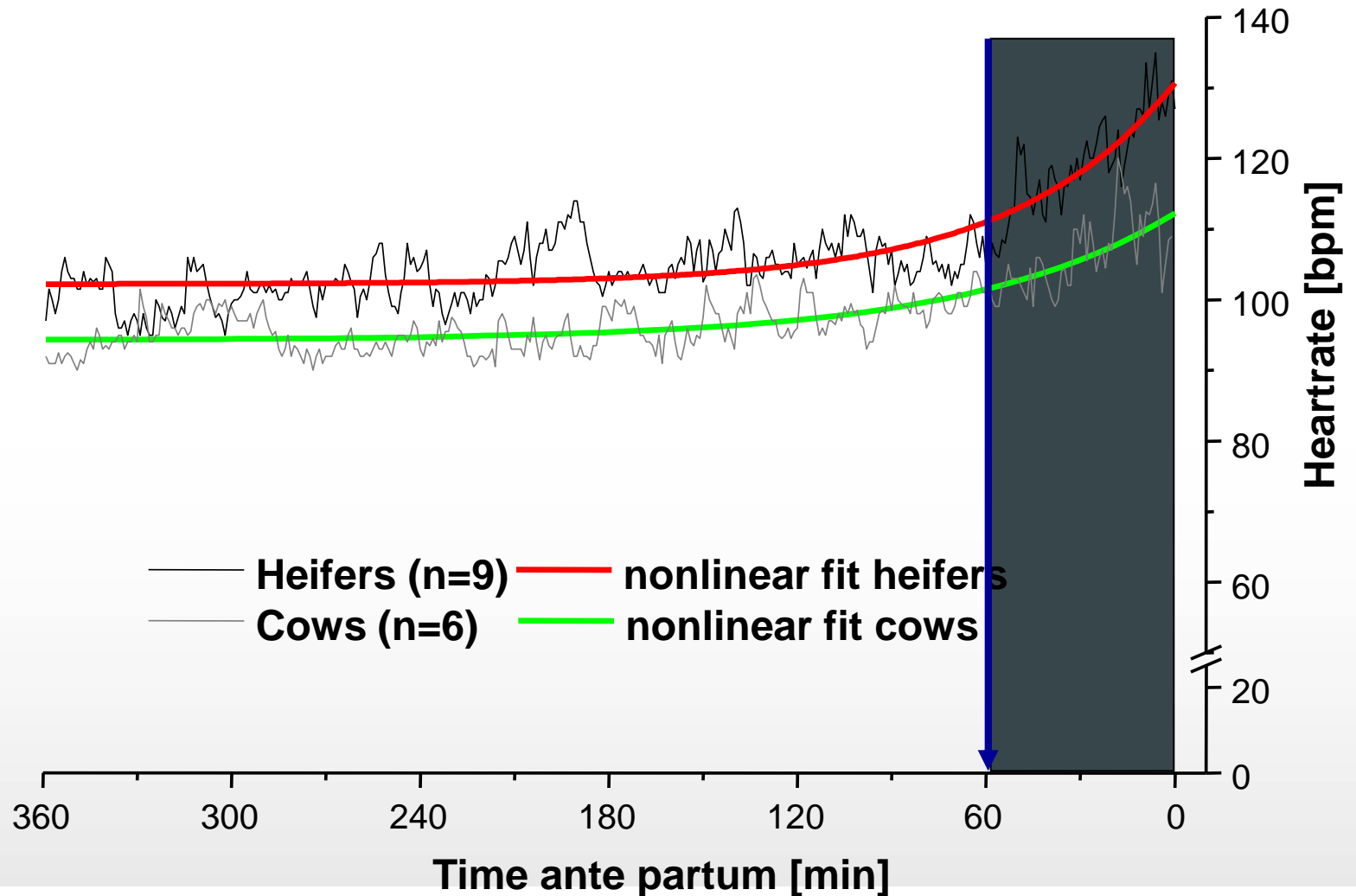
Results – Lying bouts



Results - Heartrate



Results - Heartrate



Conclusions



Pedometer

- Activity and lying behaviour give reliable results
- Telemetric device necessary

Heartrate

- Potential for short term prediction
- Less reliable
- Bolus as solution (wireless)

Thanks for your attention!

