The potential of quarter individual milking to reduce the work load

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Structure of presentation

Presentation of the results of a follow-up study measuring the *workload* of the milking parlour operative regarding different *working heights* and *weights* of milking units.

- Background information
- Study design
- Results
- Discussion

Why is it still necessary to reduce the workload?

2nd world war — 90ies — today

Mechanization of milking procedure

- Reduction of risk factors causing MSD like carrying buckets full of milk or awkward body postures
- Reduction of job diversity
- Increase of cows milked per hour

Structural changes of farm

- Increasing farm sizes
- Increasing milk yield
- Rationalization and optimization of milk withdrawel
- Milking 24 hours and 7 days per week, multi-shift operation

But:

This kind of work system changes the work profile regarding work intensity and repetition of individual work elements. The remaining manual work tasks such as cleaning the udder, premilking and attaching the milking unit are tasks with higher muscular load.

Problems

Despite the reduction of risk factors there is a significant increase of sick leave, especially in female milking parlour operatives, due to musculo skeletal disorders.

study at ATB

Work load assessment of situation
in ***modern milking parlours***

Study design

- Laboratory setting
  Herringbone milking parlour
  Artificial udder
  Trained, female subjects
  (aged between 25 and 39)

- Experimental matrix
  3 working heights
  (udder/shoulder ratio)
  2 kinds of milking units
  (1,4 kg and MultiLactor®)

Study design

Data collection

Electromyography: Biovision

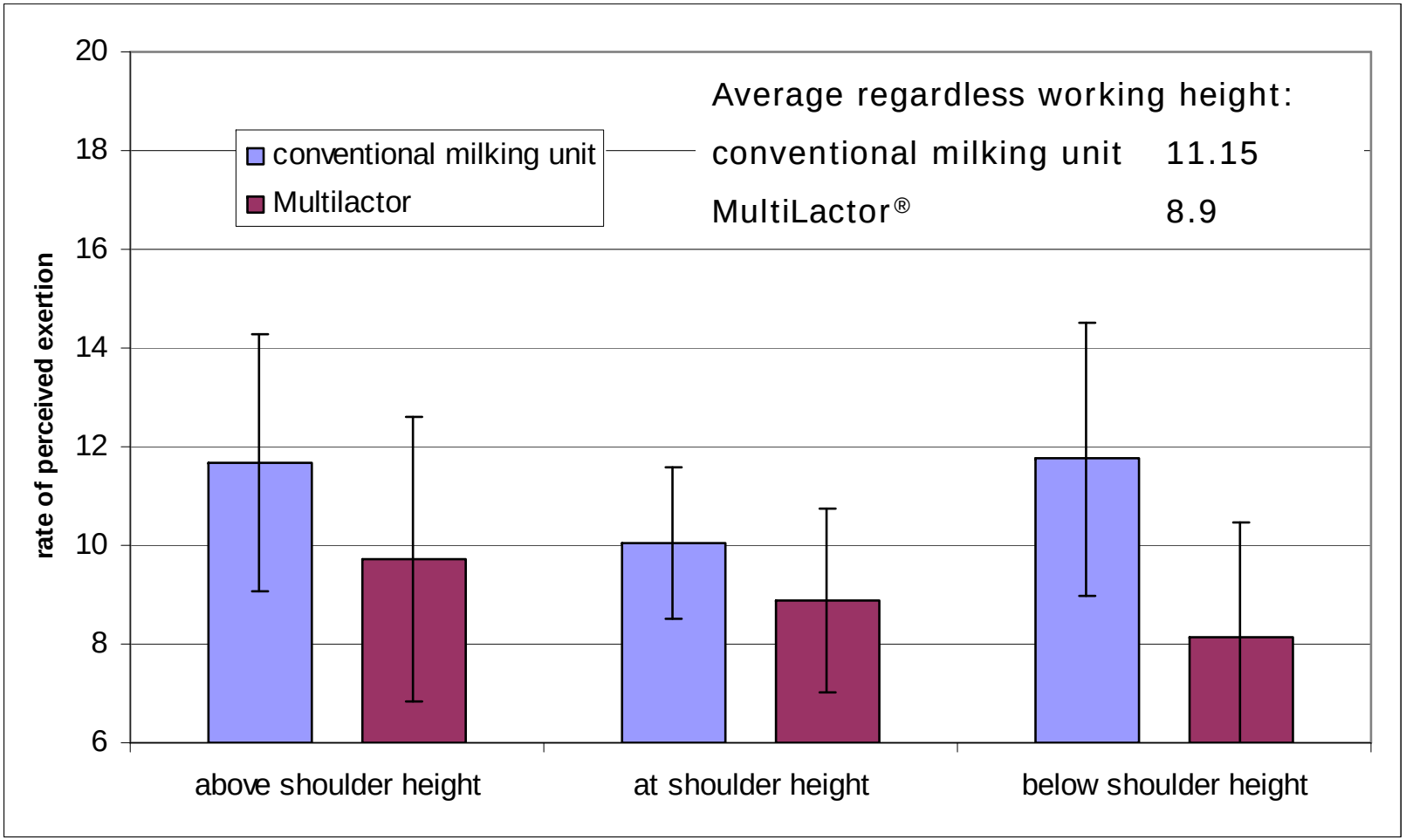
Heart frequency

Process duration

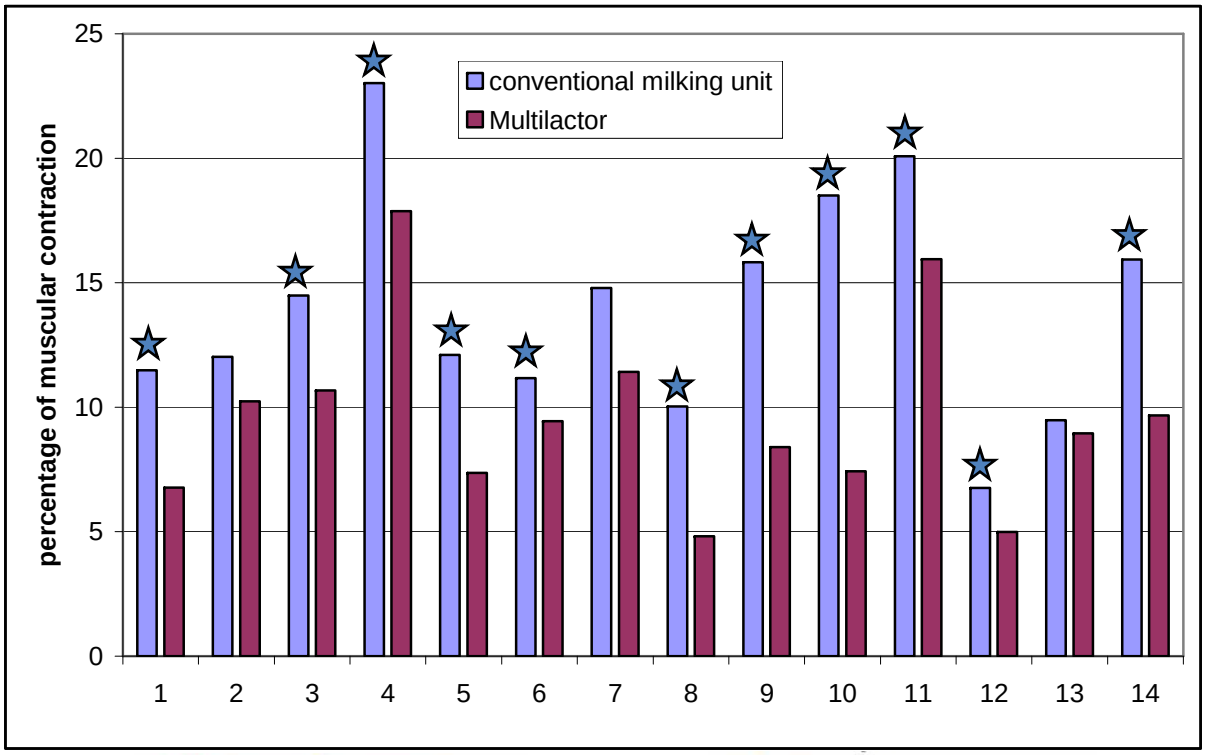
Motion analysis: video & SimiMotion software

subjective workload assessment: Borg-Scale rating

Results - Borg Scale



Results - EMG



1 M. flexor dig. superf.
2 M. ext. dig. comm.
3 M. biceps brachii
4 M. delt. pars clav.
5 M. delt. pars acrom.
6 M. trap. pars desc.
7 M. erect. spinae (lumb)

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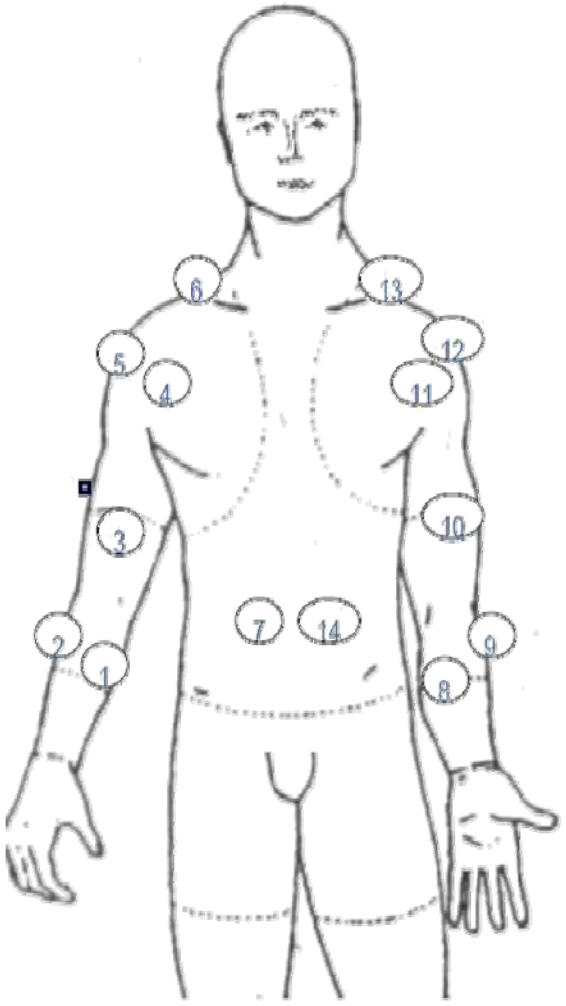
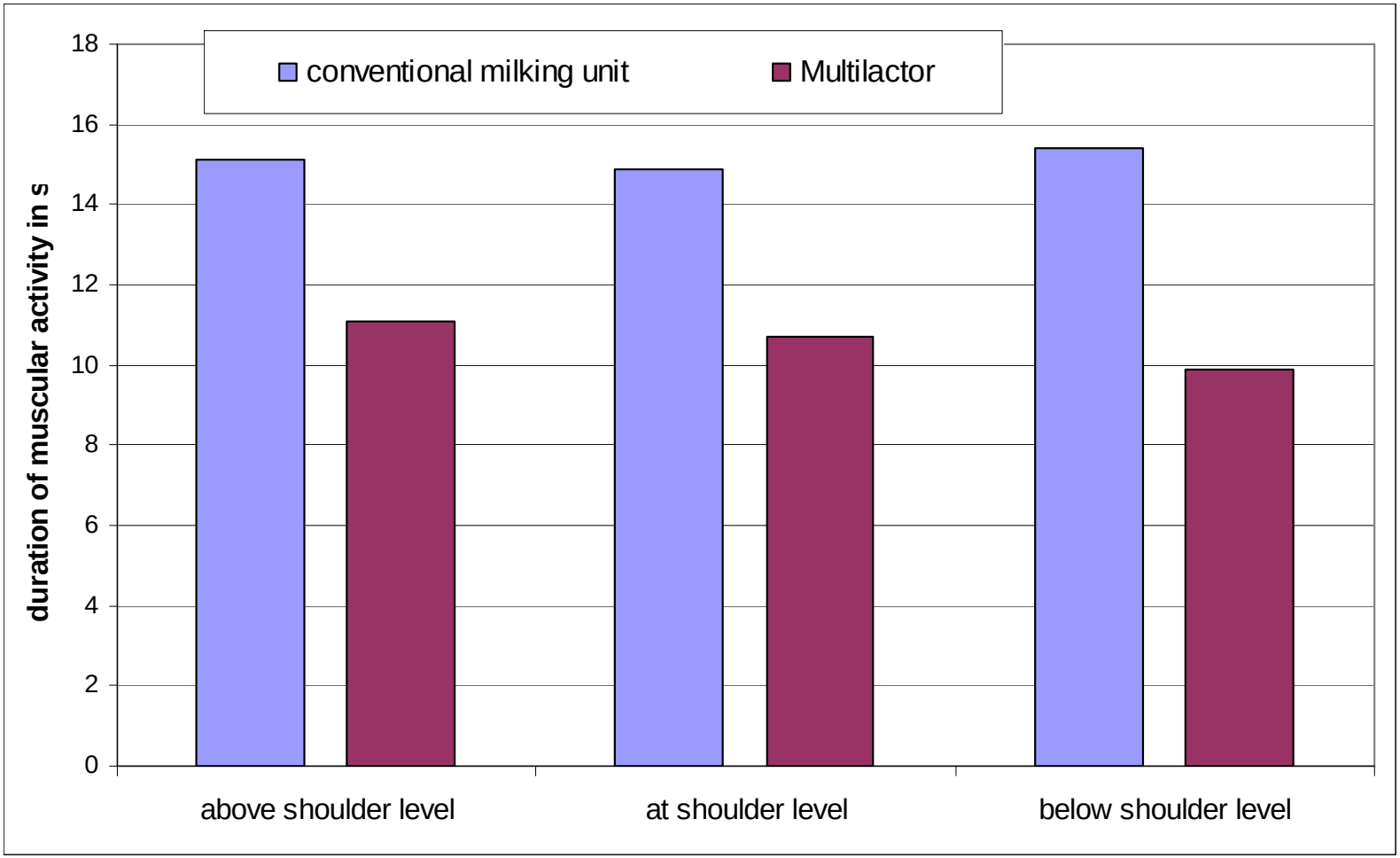
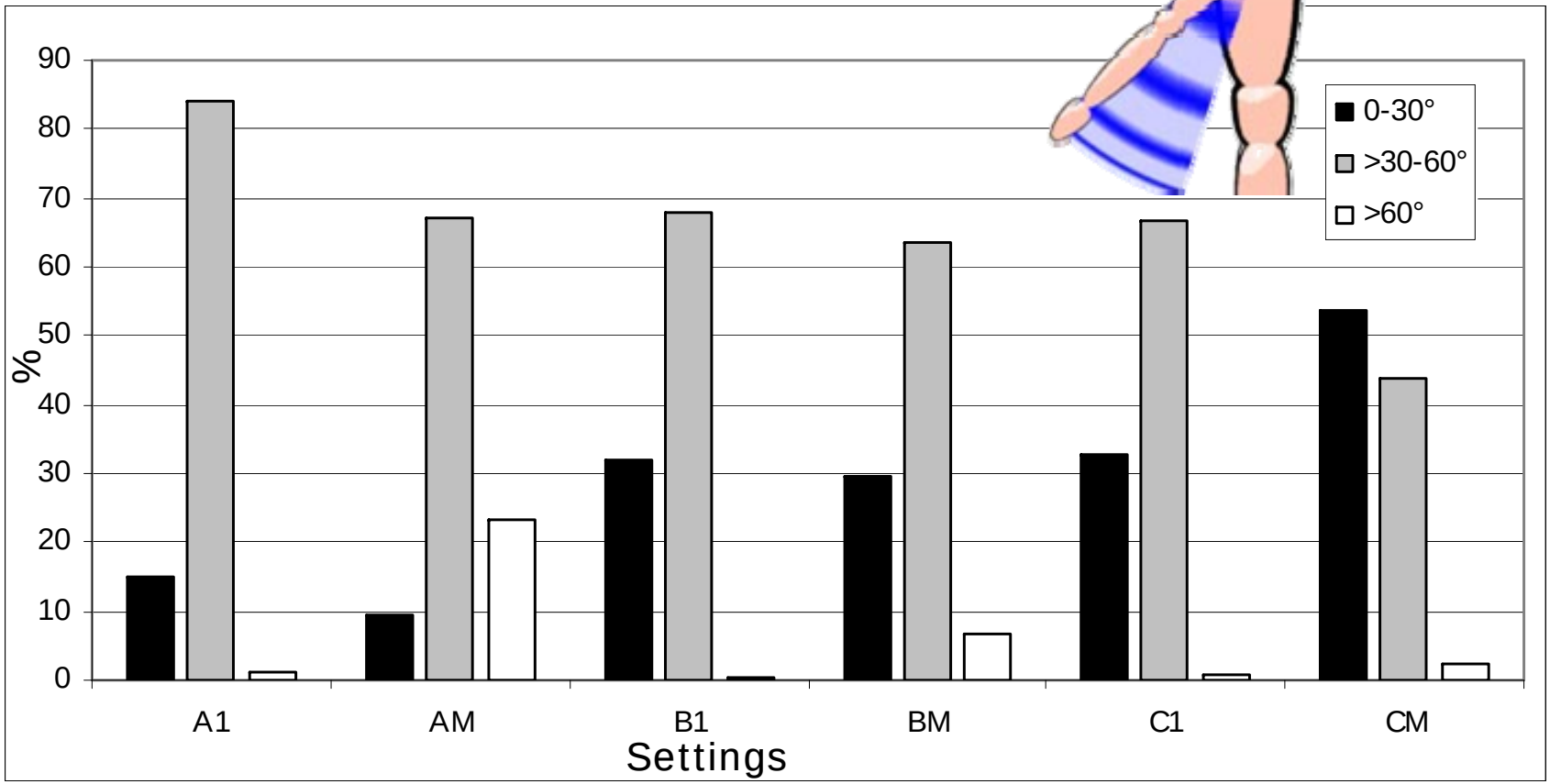


Results - process duration



Results - motion analysis (I)

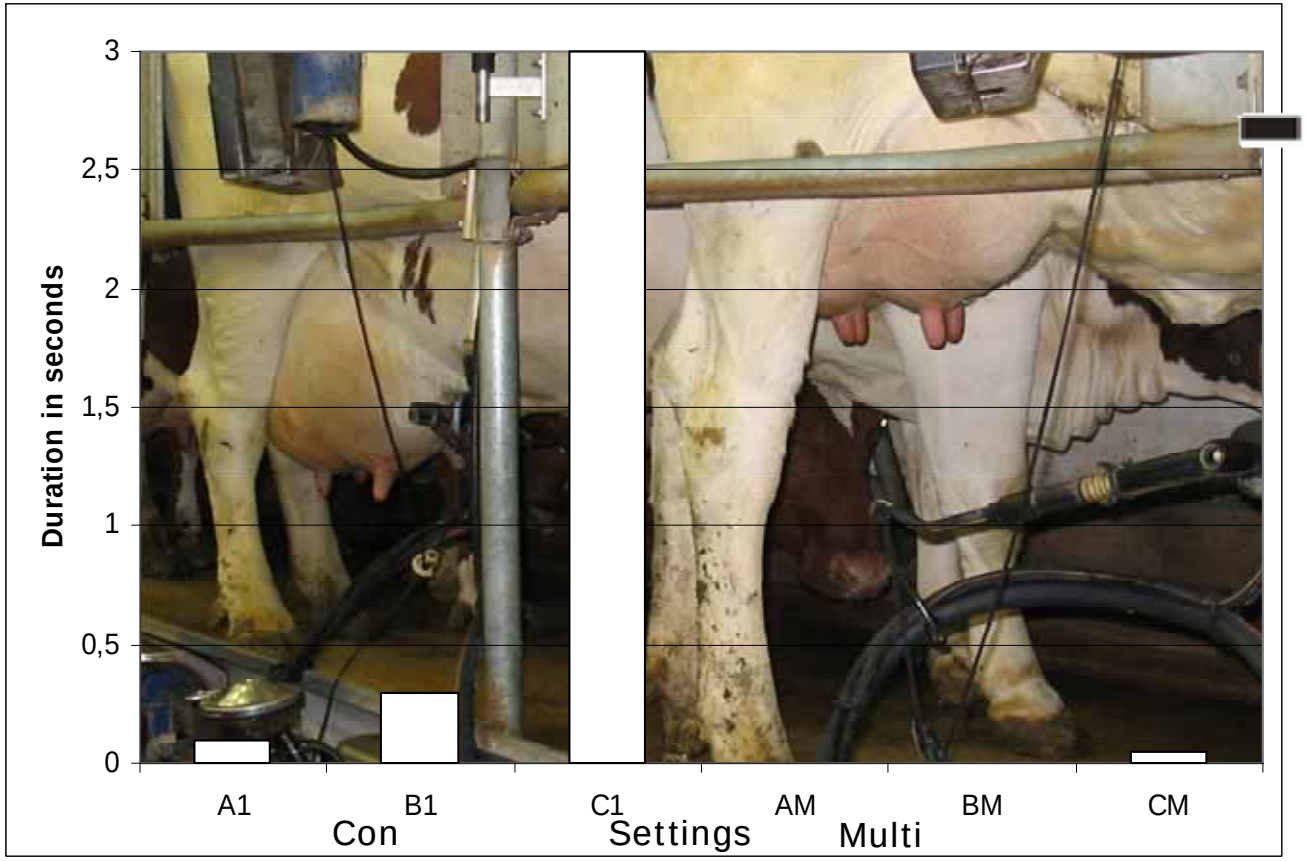
Percentages of time for upper arm elevation in °

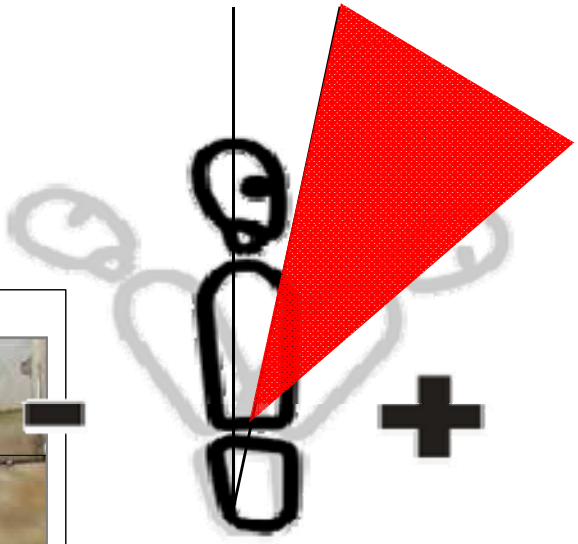


A - above shoulder hight C - below shoulder hight
B - at shoulder hight 1 - Con M - Multi

Results - motion analysis (II)

Upper body inclination increasing 20°

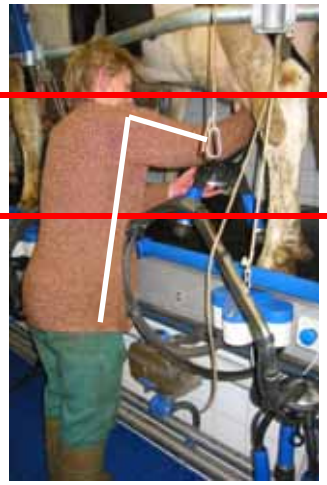




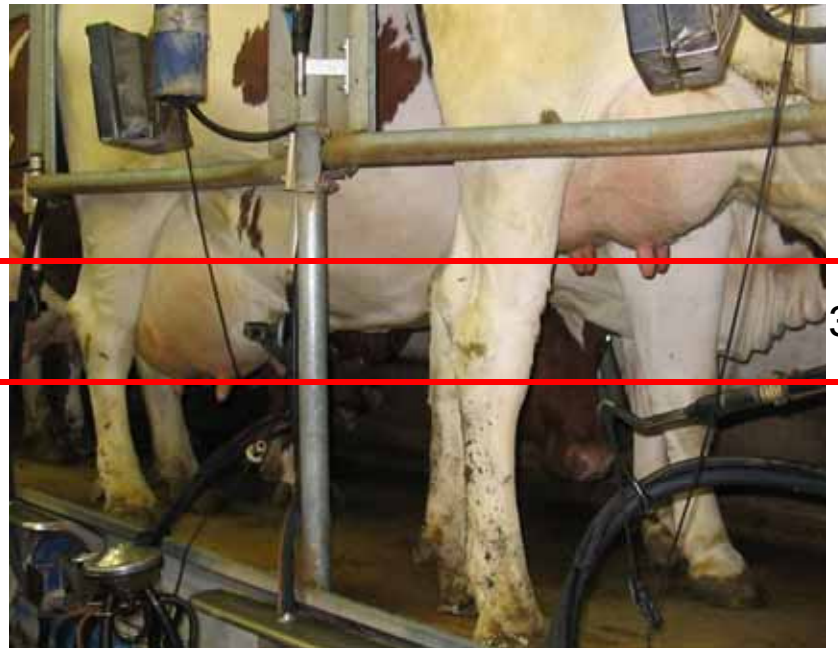
Discussion and conclusions (I)

- Fairly small (15 cm respectively) variations within the ergonomic setting strongly influenced posture and comfort.
- In practice the vertical distances of the cows' udders in combination with the body height of the workers may induce variations easily exceeding 15 cm.

above shoulder

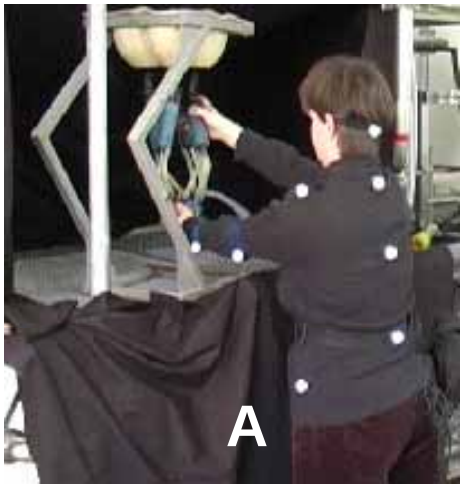


below shoulder



Discussion and conclusions (II)

- Experimental setting A and C are likely to cause physical overload according to the applied standards.
- The upper body inclination was lower when using the MultiLactor®.
- There is no holding of the cluster when a quarter individual system is attached and motions are more dynamic.



above

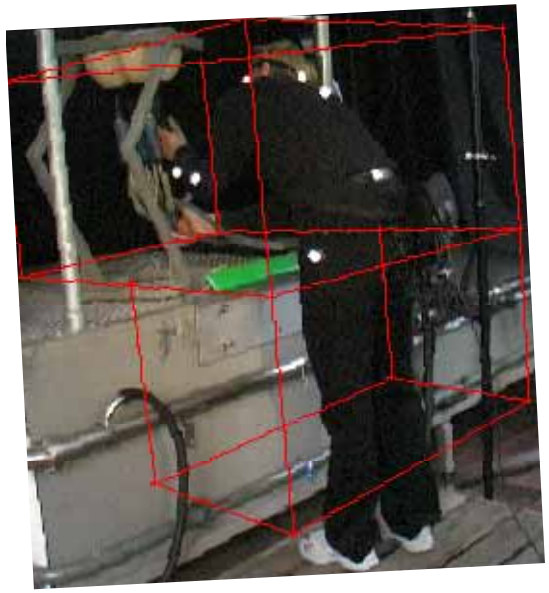
shoulder level

below

Conclusions

Potential of the MultiLactor® to reduce the workload

- No static component while attaching a cluster
- Lower muscular activity for most muscle groups
- Lower impact of working height on the body posture
- Less time needed for attaching the cups
- Better rating by the workers



Thank you very much for your attention!

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