1st DairyCare Conference, Copenhagen

What data do we need in dairy cattle welfare assessment?

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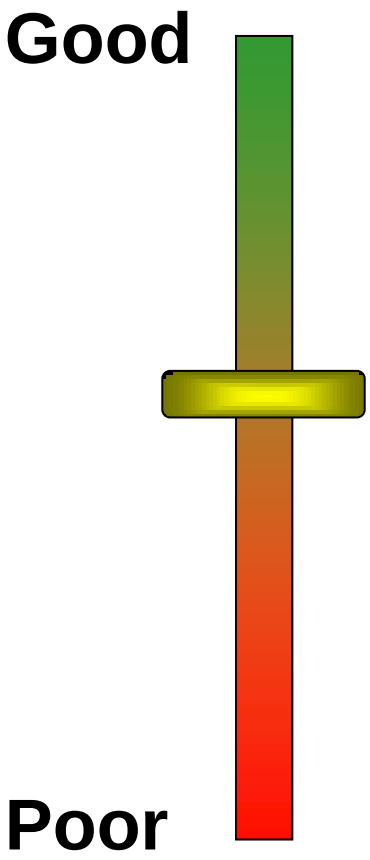
How do you feel today?

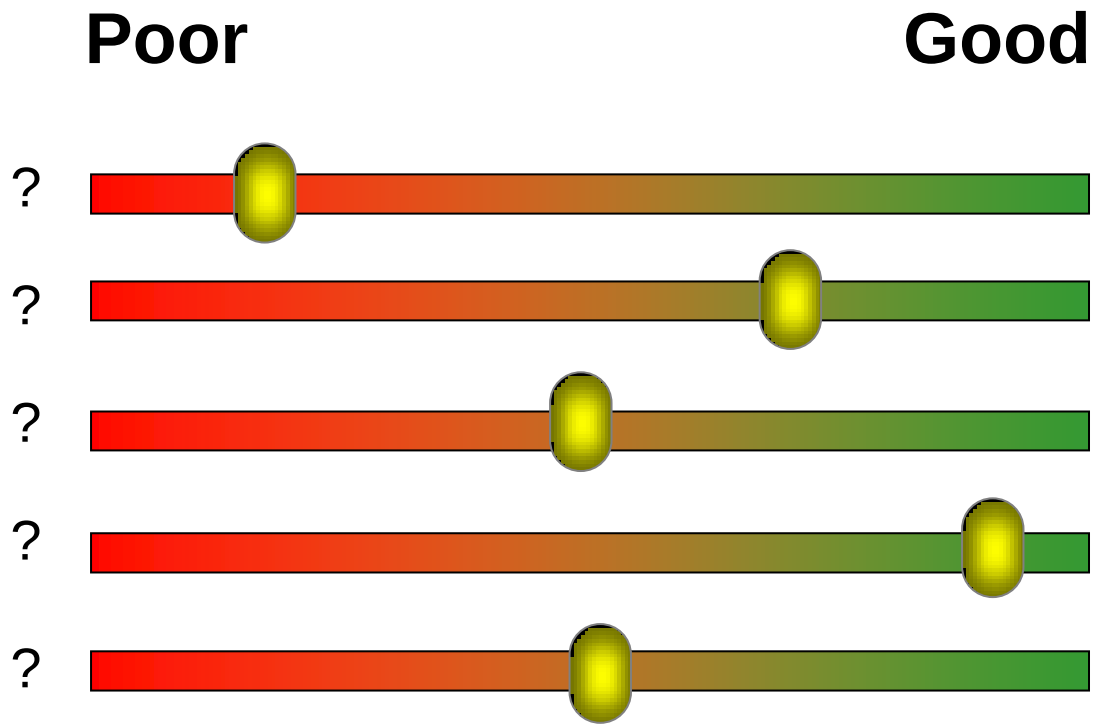


- Fantastic
- Quite good
- Reasonably well
- OK
- Not very well
- Miserable
- Terrible

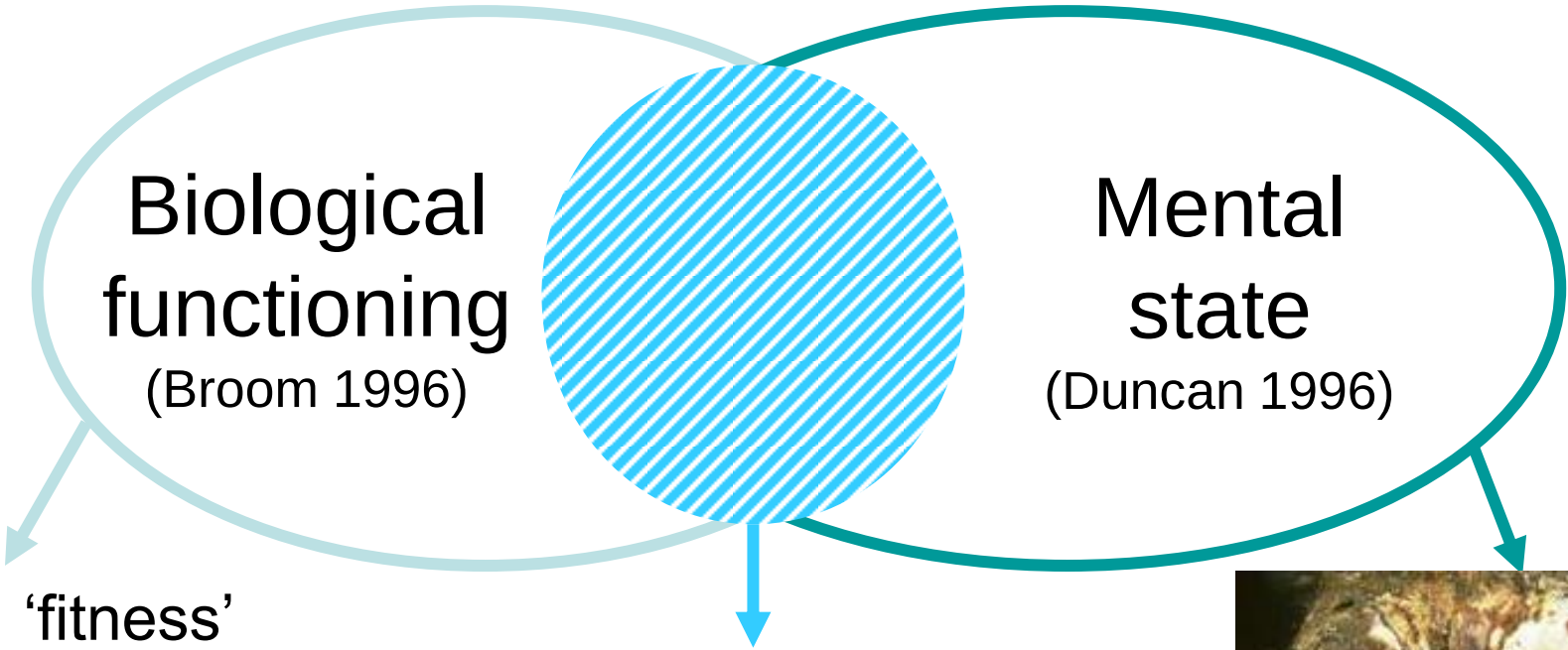
Why?

Why?


Poor
Good
Chair comfort
Hunger
Hot / cold
Social relationships
Health state
Total


Poor
Good
?
?
?
?
?

Concepts of animal welfare



‘fitness’

e.g. subclinical disorders

e.g.
clinical diseases, lesions, wounds

Concepts of animal welfare

Biological functioning
(Broom 1996)

Mental state
(Duncan 1996)

‘Naturalness’
(Fraser 2003)

ability to perform normal behaviour repertoire

Measure all aspects

Five Freedoms

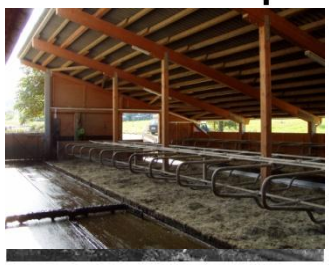
- From hunger and thirst
- From discomfort
- From pain, injury and disease
- From fear and distress
- To perform normal behaviour

12 Welfare Quality® Criteria

- Absence of prolonged hunger
- Absence of prolonged thirst
- Comfort around resting
- Thermal comfort
- Ease of movement
- Absence of injuries
- Absence of disease
- Absence of pain …
- Expression of social behaviours
- Expression of other behaviours
- Good human-animal relationship
- Positive emotional state

Progress in on-farm welfare assessment: Outcome-based vs. Resource-based

Influencing factors
= indirect parameters

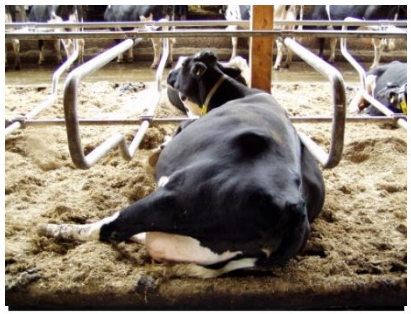


Housing

Management,
human-animal
relationship

Genetics, ...

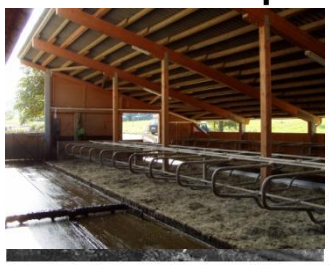
WELFARE?



e.g. Animal Needs Index (Bartussek 2001)

Progress in on-farm welfare assessment: Outcome-based vs. Resource-based

Influencing factors
= indirect parameters



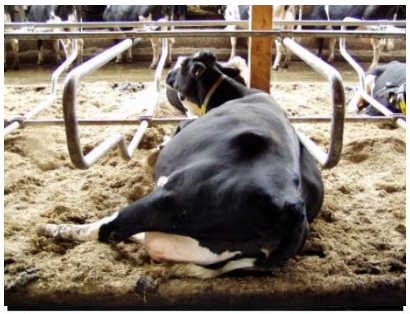
Housing

Management,

human-animal relationship

Genetics, ...

WELFARE?

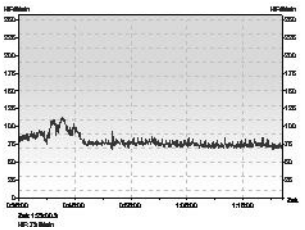


Output
= direct parameters

Health, injuries

Behaviour

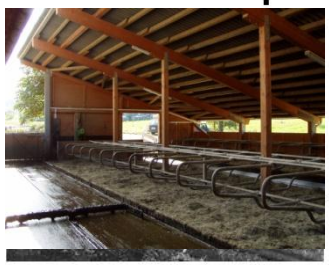
Physiology



Progress in on-farm welfare assessment: Outcome-based vs. Resource-based

Influencing factors
= indirect parameters

Output
= direct parameters



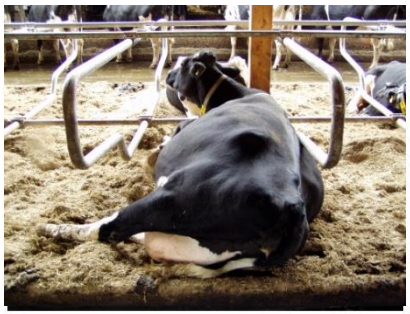
Housing

Management,
human-animal
relationship

Validity questionable

Genetics, ...

WELFARE?

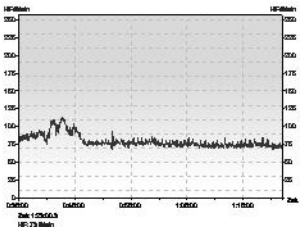


Health, injuries

Behaviour

Validity often high

Physiology



Focus in this talk

- Animal-based measures
- On-farm welfare assessment and welfare monitoring
- Validity of welfare indicators
- NO discussion about acceptable thresholds etc.

Biological functioning

Production diseases

Biological functioning

- Lameness
- (Sub)clinical mastitis
- Metabolic disorders
- Body condition

Production diseases

Biological functioning

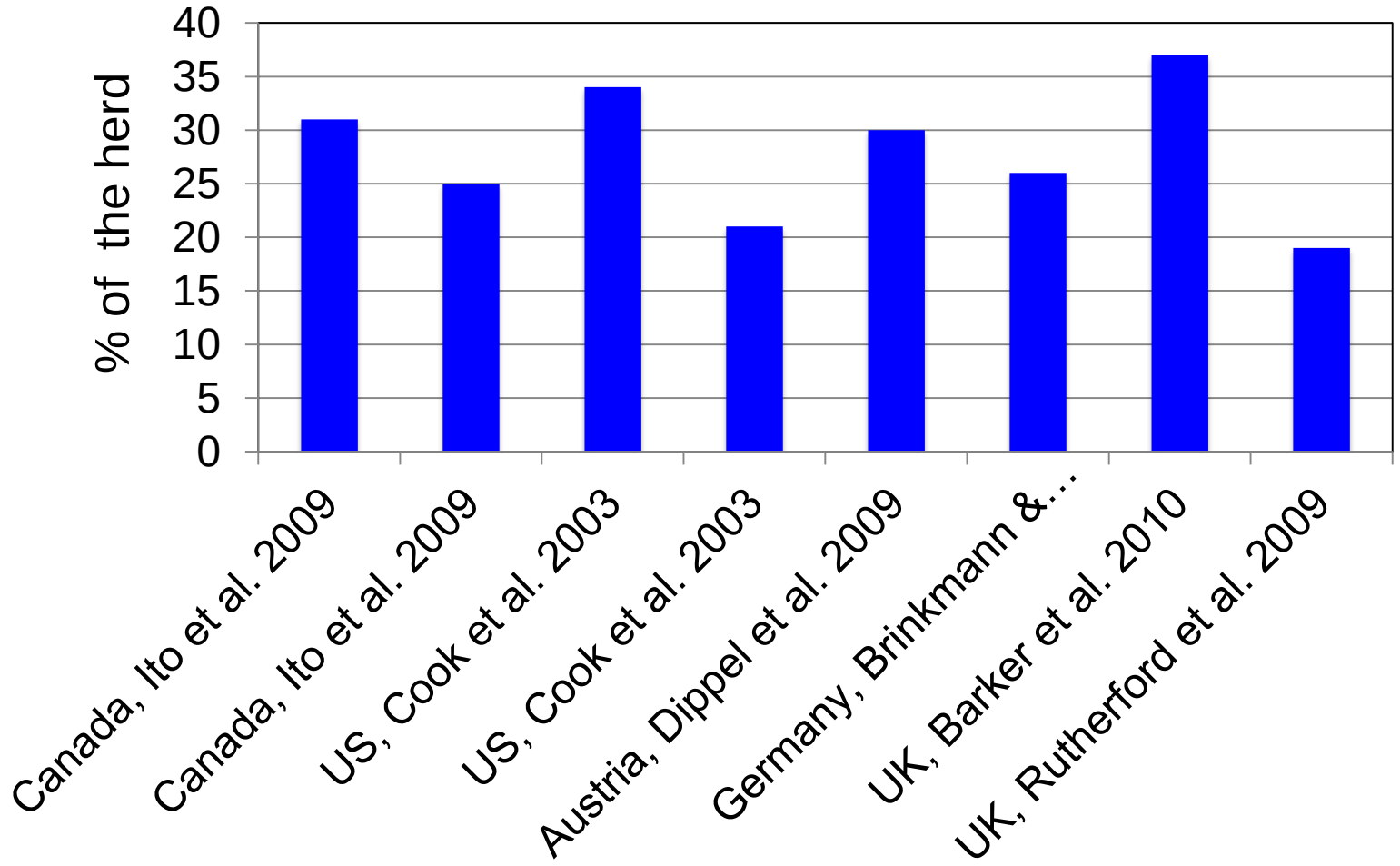
- **Lameness**
- (Sub)clinical mastitis
- Metabolic disorders
- Body condition

Lameness

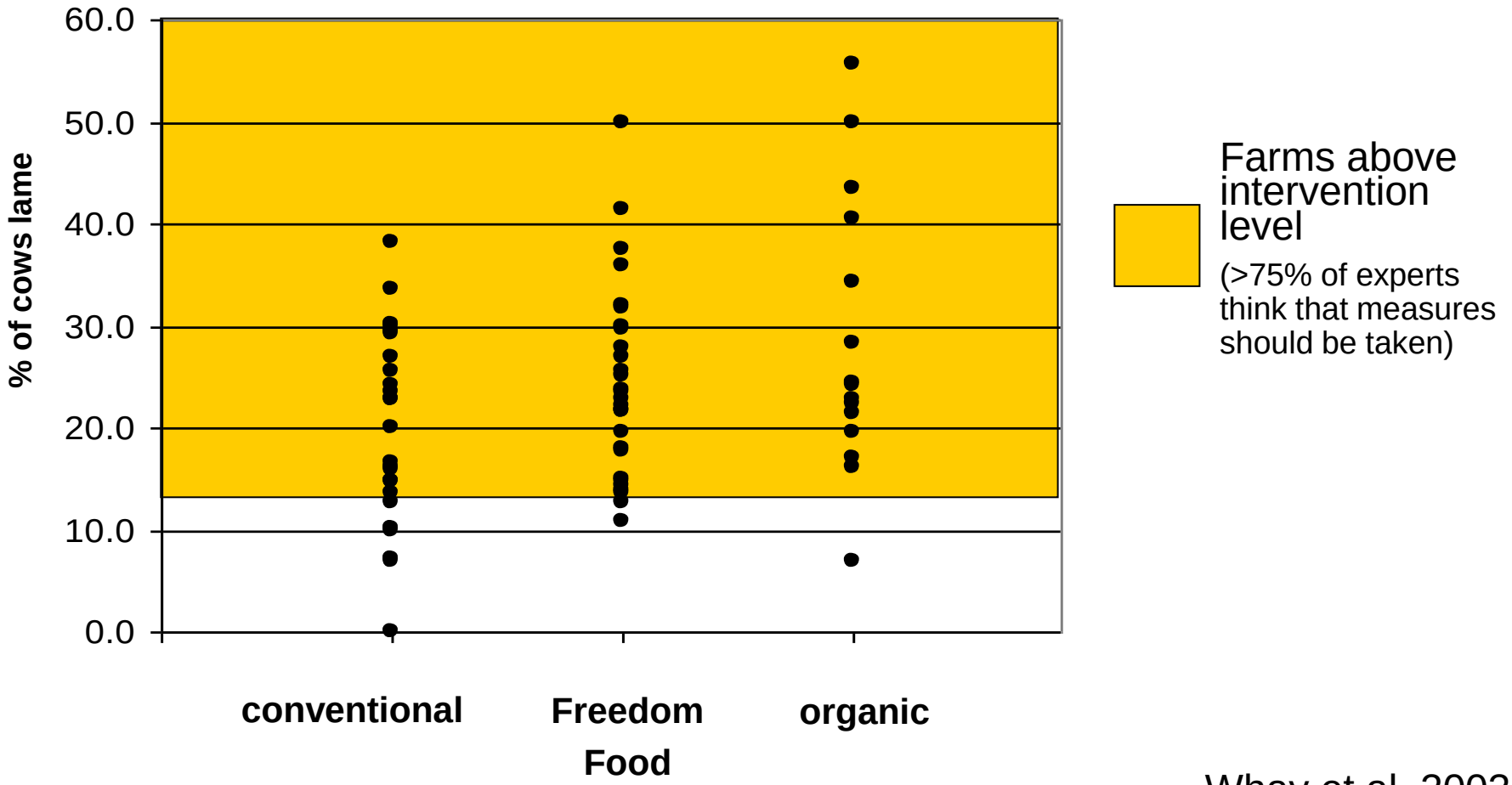
Convincing face and construct validity:

- Pain very likely cause (Rushen et al. 2007)
- Impairment of mobility and of access to resources (Borderas et al. 2008)
- Association with reduced yield, fertility and longevity

Lameness prevalence



Lameness a relevant problem in dairy cattle, irrespective of farming system

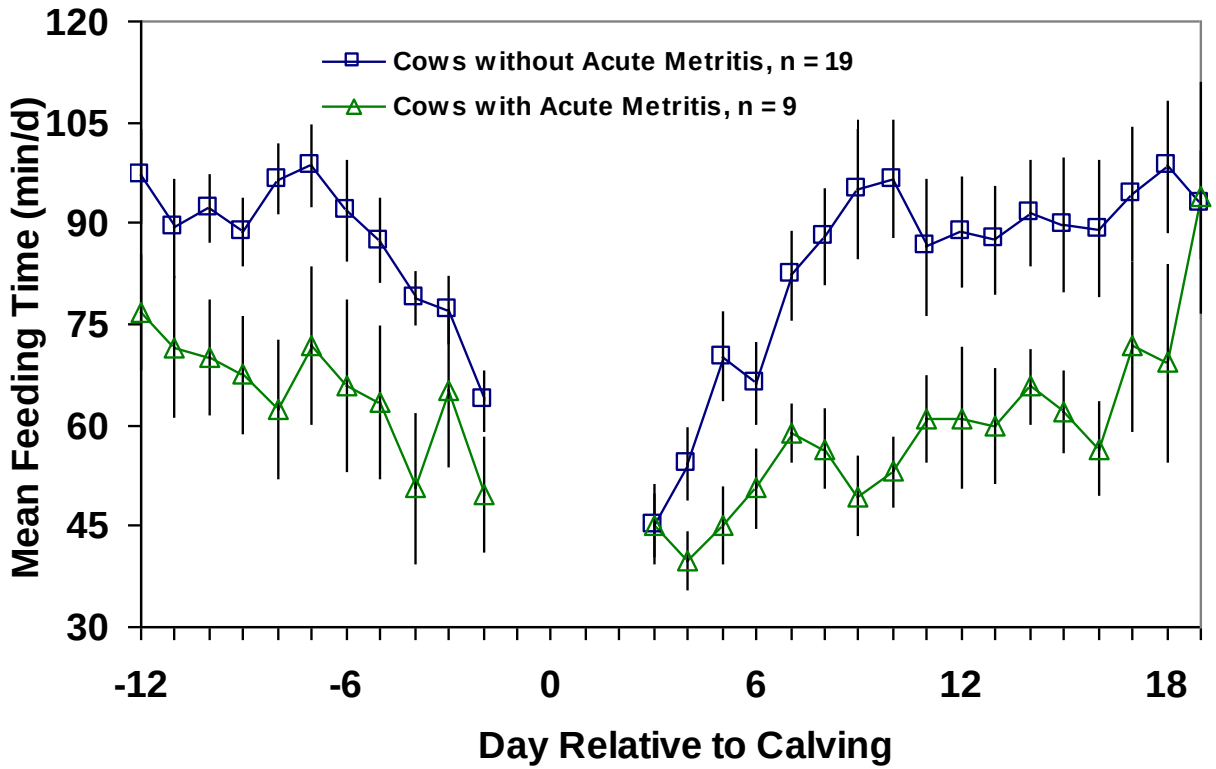


Whay et al. 2003

Feeding behaviour as early predictor of disease

Biological functioning

Mean presence at the feed bunk for healthy and metritic cows



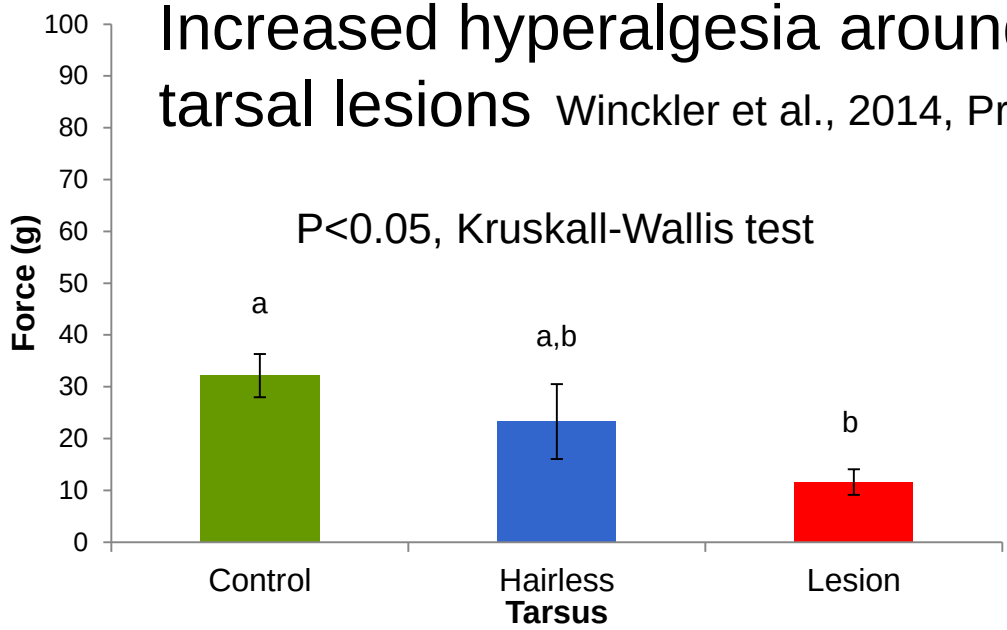
Urton et al. 2005

Health state and beyond

Biological functioning

- Other clinical diseases
- Alterations of the integument (e.g. hock lesions, swellings)

Increased hyperalgesia around tarsal lesions Winckler et al., 2014, Proc. ISAE



Health state and beyond

Biological functioning

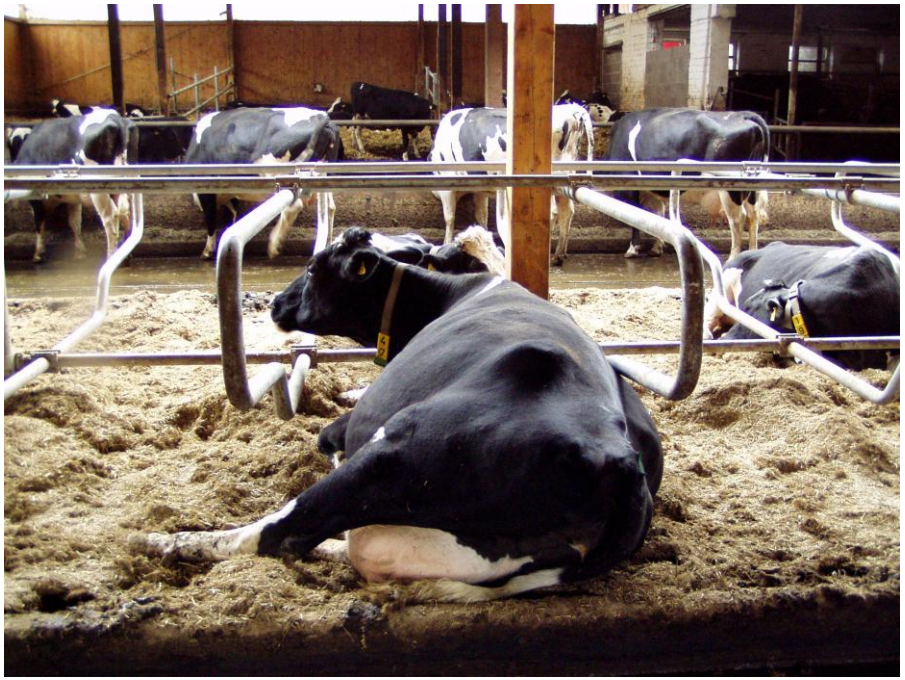
- Other clinical diseases
- Alterations of the integument (e.g. hock lesions, swellings)
- Cleanliness
- Mortality, (reasons of) unvoluntary cullings
- Fertility, longevity


Naturalness

Normal behaviour

Naturalness

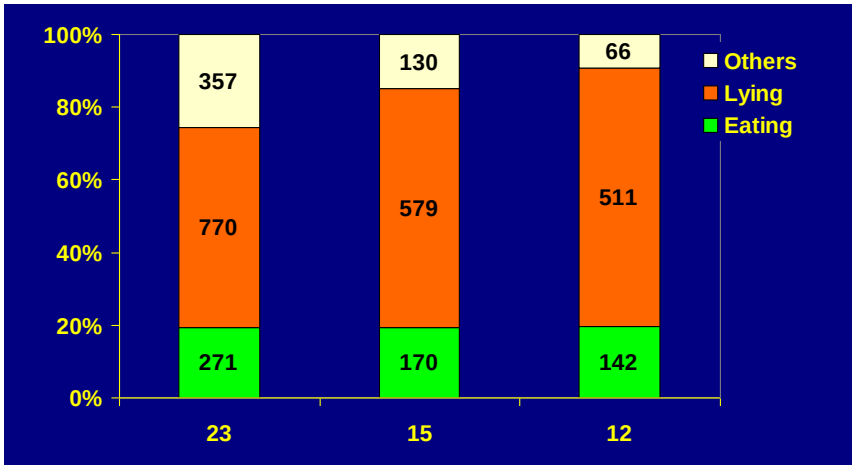
- Time budgets - high priority behaviours such as lying, feeding, rumination



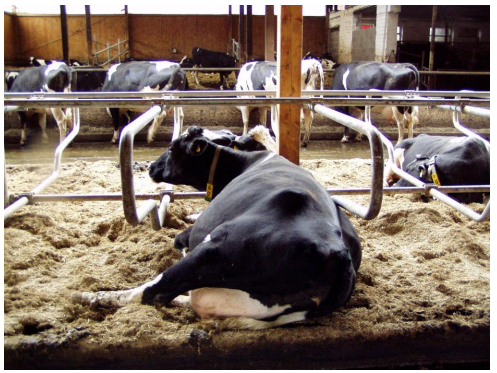
Lying time

Naturalness

- Pregnant heifers showed an inelastic demand for rest of about 12-13h/24h (Jensen et al. 2005)
- High (relative) priority for lying when access to resources limited (Munksgaard et al. 2005)
- Assumed to be linked with production diseases such as lameness



h of access to resources



Normal behaviour

Naturalness

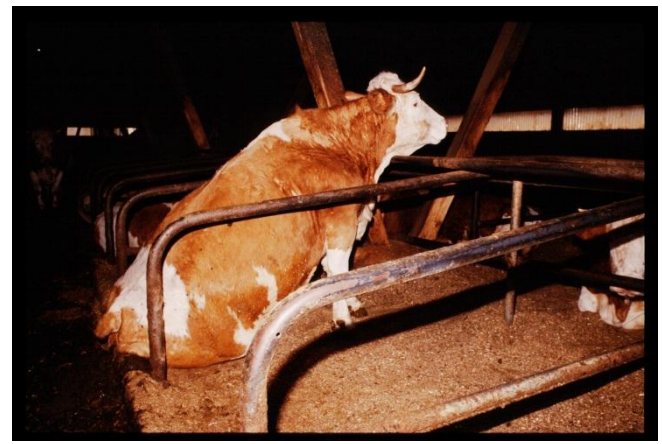
- Time budgets - high priority behaviours such as lying, rumination
- Incidence of unwanted behaviours, e.g. **agonistic interactions**

  - unstable social relations
  - impaired access to resources
  - risk of injuries

Normal behaviour

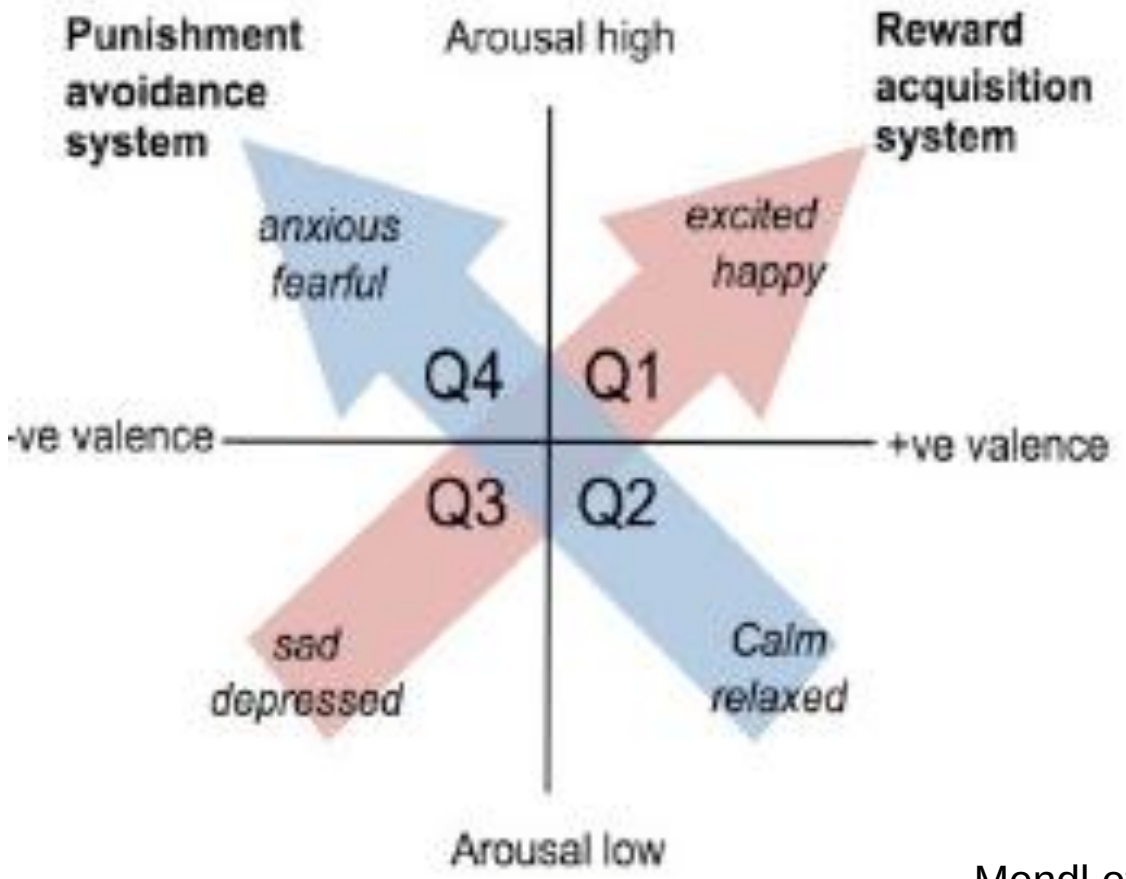
Naturalness

- Time budgets - high priority behaviours such as lying, rumination
- Incidence of unwanted behaviours, e.g. agonistic interactions
- Incidence of abnormal behaviours, e.g. stereotypies, altered sequence of behaviours




Mental state

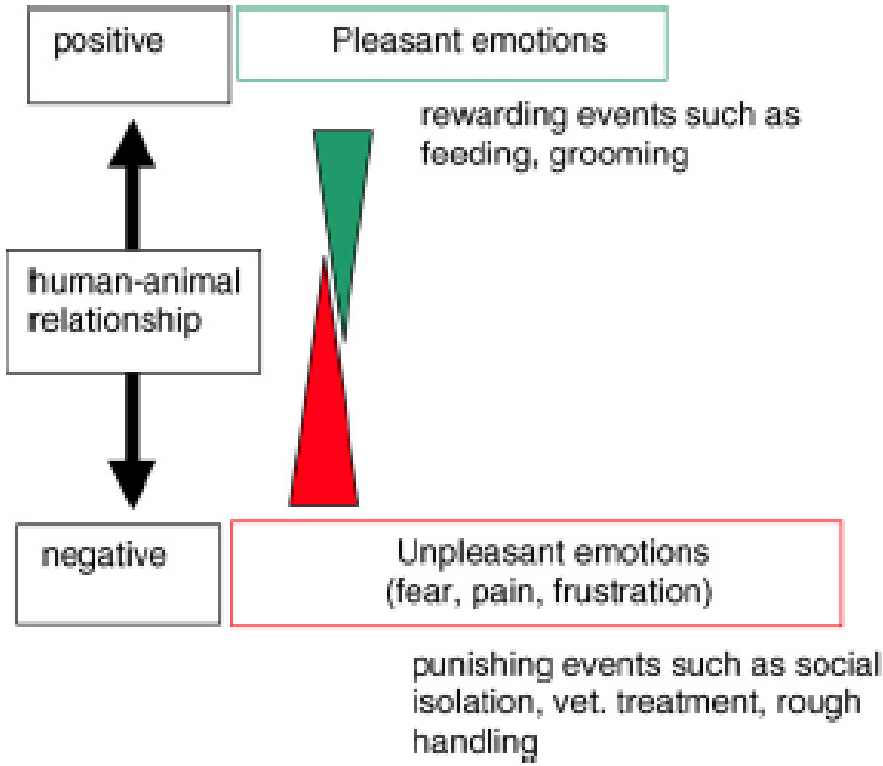
Valid measures of emotional state



Mendl et al., 2011

Human-animal relationship

Mental state



- Reduced milk yield
- Impaired milk let down
- Chronic and acute stress responses
- Traumatic incidents

Waiblinger et al., 2007

Human-animal relationship

Mental state

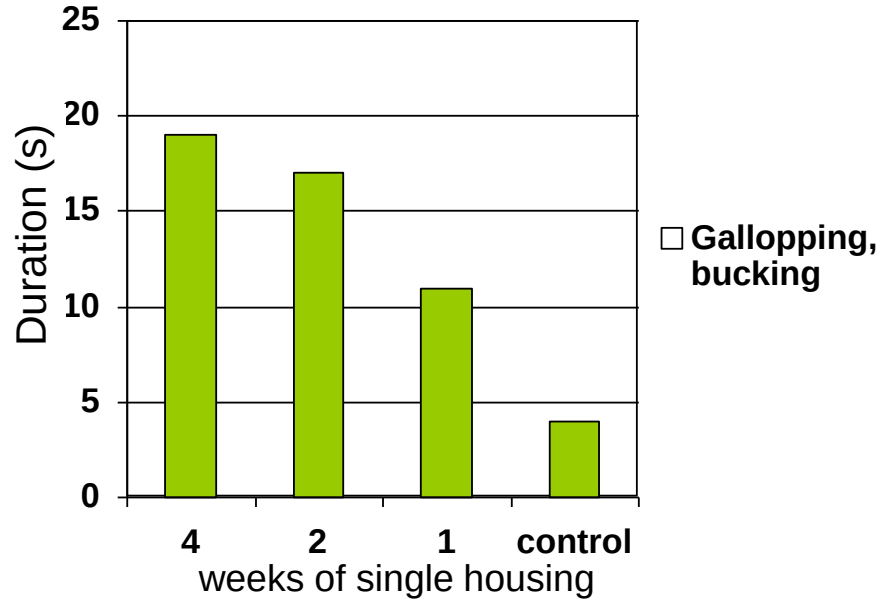
- Avoidance or approach tests

Indicators of positive emotional state

Mental state

- Play behaviour

  - rewarding activity
  - only occurs under favourable conditions
  - reduced in painful situations, e.g. following disbudding



Jensen et al., 1999

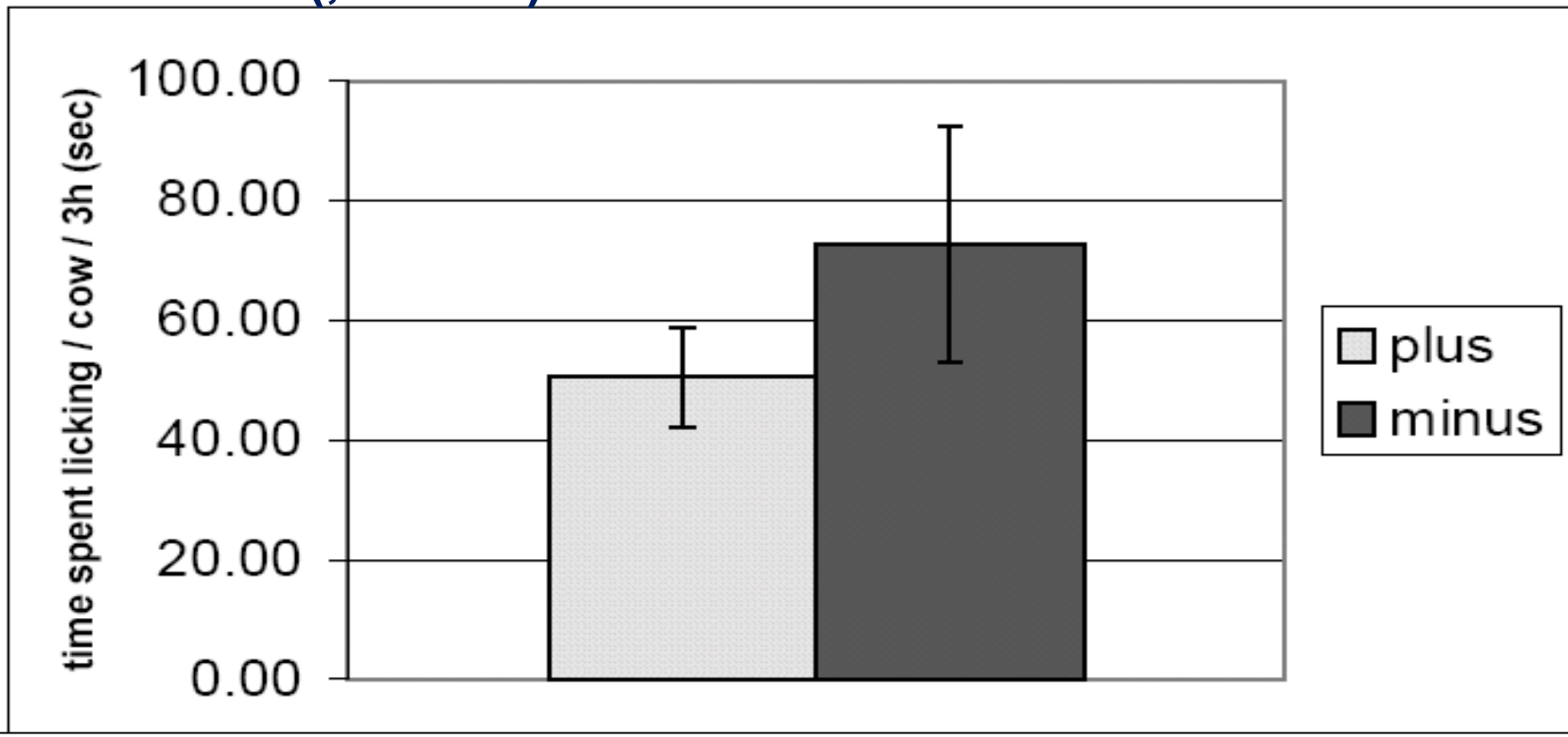
Indicators of positive emotional state

Mental state

Less clear-cut measures: e.g. **social licking**

- Expected to be associated with positive feelings.
- Cattle in herds with ⇧ social licking are feeling better than in herds with ⇩ social licking?

Emmerig, 2004: Two groups of dairy cows in cross-over design in two different situations of space restriction (‚minus‘)

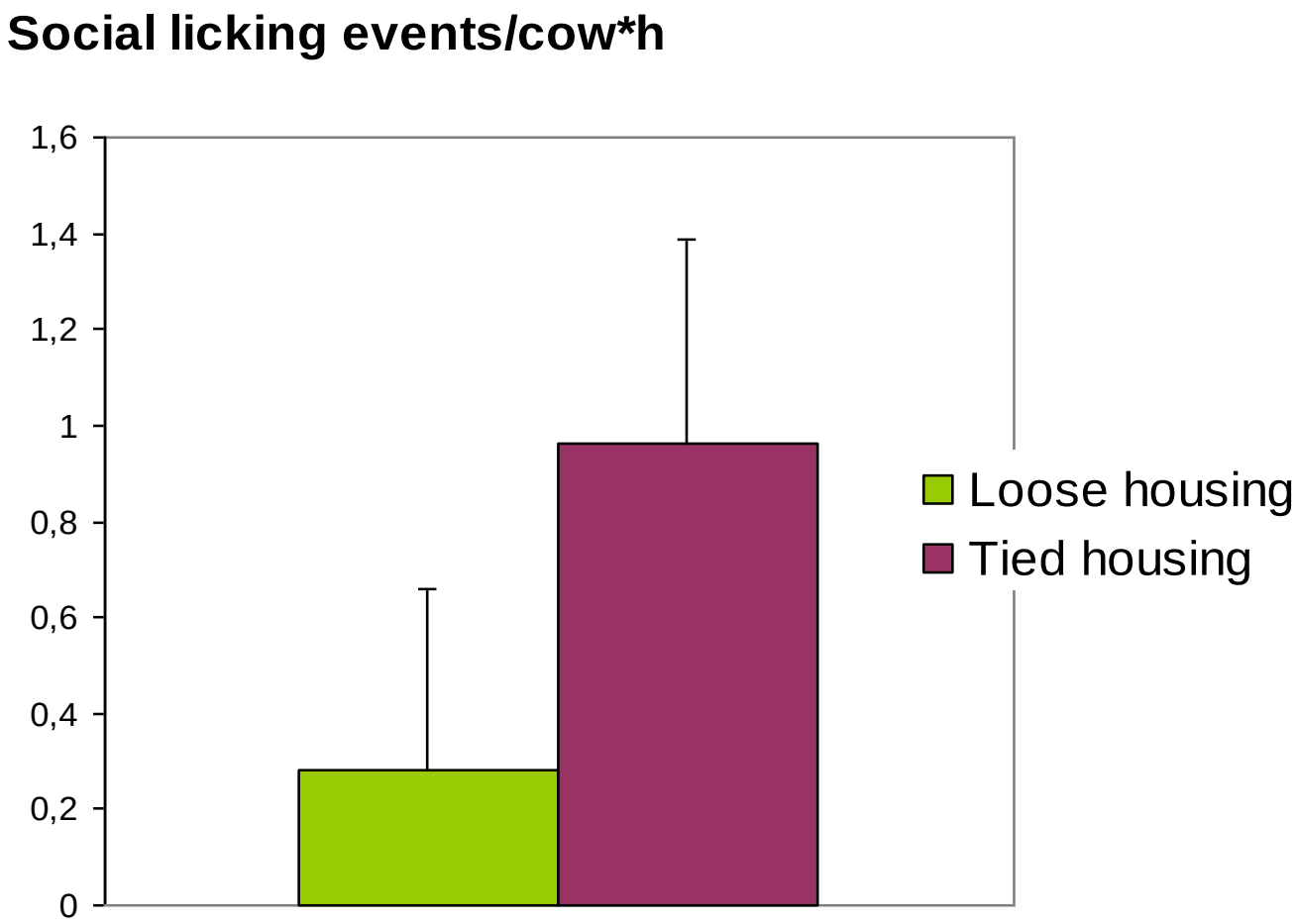


Social licking may reflect e.g.:

- attempts to reduce tensions ⇨ conflict

  (Reinhardt 1980, Sato et al. 1991, Waiblinger et al. 2002)

Laister et al., 2006: Social licking on 31 loose and 12 tied housing dairy farms in Austria, Germany and Italy



Boredom or oral understimulation (Fraser & Broom 1990).

Indicators of positive emotional state

Mental state

Less clear-cut measures: e.g. **social licking**

- Expected to be associated with positive feelings.
- **but may in certain cases merely alleviate poor welfare**

Indicators of positive emotional state

Mental state

Promising measures: **subtle behaviours or postures**

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journal homepage: www.elsevier.com/locate/applanim

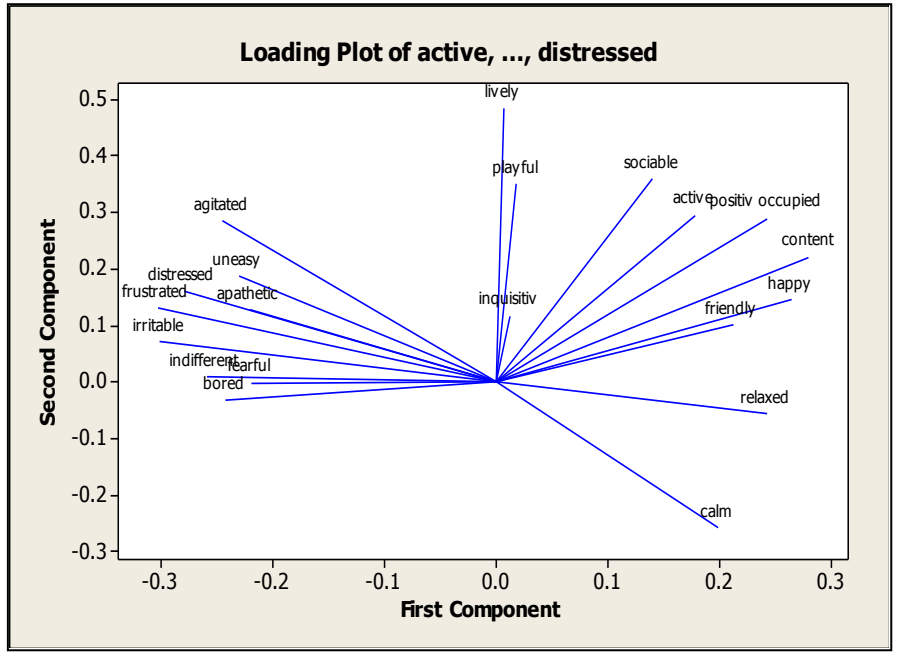
Ear and tail postures as indicators of emotional valence in sheep☆

Nadine Reefmann [a,b,*], Franziska Bütikofer Kaszàs [a,c], Beat Wechsler [a], Lorenz Gygax [a]

Indicators of positive emotional state

Mental state

Promising measures: **assessment of body language through Qualitative Behaviour Assessment**
(e.g. Wemelsfelder et al. 2001, Andreasen et al. 2012)



Conclusions

- Measures all aspects – but do not measure everything
- What data do we need?

  - incidence of health disorders, early indicators of disease
  - incidence/prevalence of injuries
  - body condition
  - time budgets
  - incidence of spontaneously occurring behaviours
  - behavioural tests
  - measures of human-animal relationship
  - measures of positive emotional state

Thank you