Mental health in animals:
A shift towards positive welfare indicators

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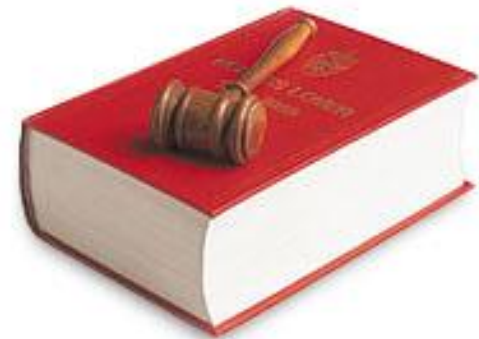
Quality of life....

...is not about what we have – but what we feel that we have, and how happy we are about it....
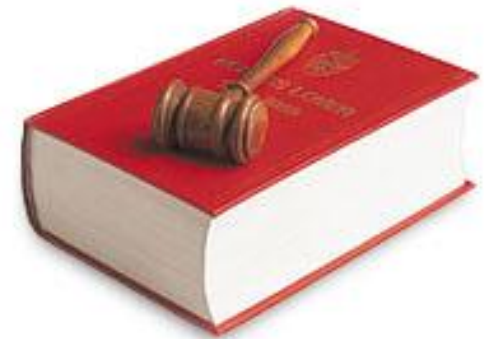

(Arne Næss, 1912-2009)

Animal welfare:
Quality of life in animals

- ....focus on the importance of the physical and mental needs of animals related to conscious experience of their emotions in the new Animal Welfare Act (2010)
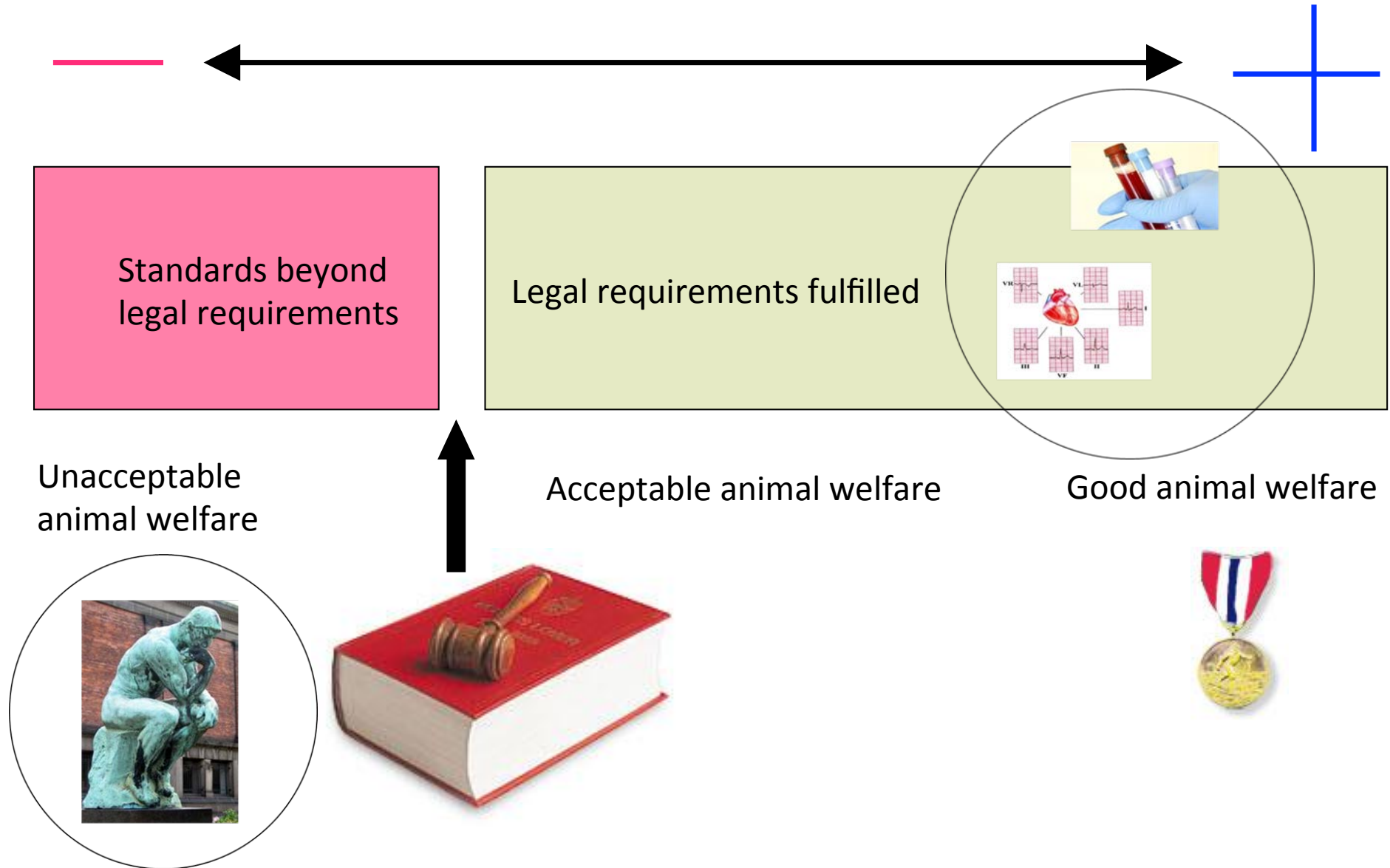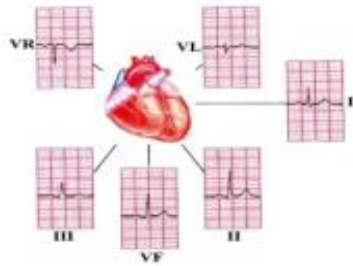
WHY a New Animal Welfare Act?

- Significant developments in the knowledge regarding animals' **abilities and needs**, combined with a desire from society that animals shall be treated in an **ethical** way.

- Takes into account animal's ability to experience **positive and negative emotions** consciously.

The range of animal welfare

Standards beyond legal requirements

Legal requirements fulfilled

Unacceptable animal welfare

Acceptable animal welfare

Good animal welfare

Animal welfare: Definitions

- Biological function
- Subjective experience

Biological functioning approach

- Health
- Production
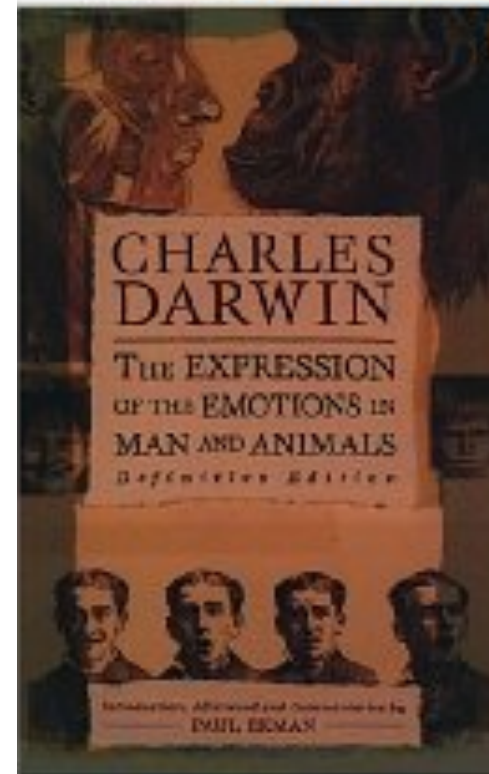- Stress

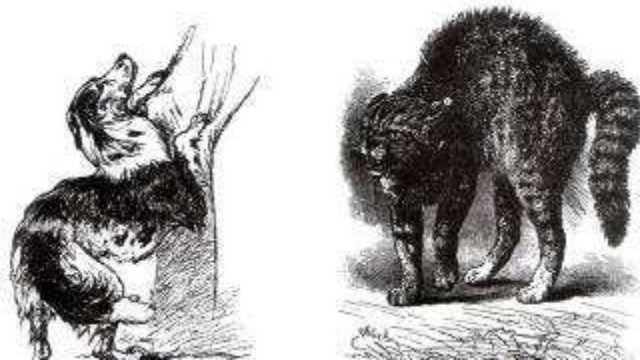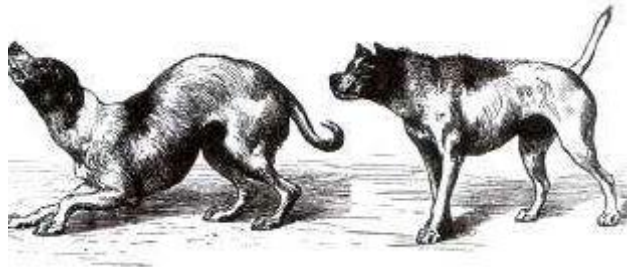# Feeling & subjective experience approach

How can we ask scientific questions about how animals feel?

Animal suffering

- "The question is not, Can they reason? nor, Can they talk? but, *Can they suffer*?" (Jeremy Bentham 1748-1832)

- Animals conscious experience of negative emotional state is the basis for animal welfare research
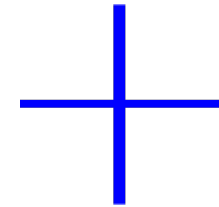
Animal emotions: Not very novel!

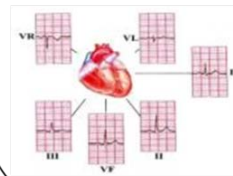Darwin (1872): "The Expression of Emotions in Man and Animals"

Assessing animal welfare

Biological function:
Poor health, impaired production…

Subjective feelings:
Suffering – i.e. pain, frustration, fear…

?

Quality of life in animals

Positive emotions and animal welfare

Review

Assessment of positive emotions in animals to improve their welfare

Alain Boissy [a,*], Gerhard Manteuffel [b], Margit Bak Jensen [c], Randi Oppermann Moe [d], Berry Spruijt [e], Linda J. Keeling [f], Christoph Winckler [g], Björn Forkman [h], Ivan Dimitrov [i], Jan Langbein [b], Morten Bakken [j], Isabelle Veissier [a], Arnaud Aubert [k]

Abstract

It is now widely accepted that good welfare is not simply the absence of negative experiences, but rather is primarily the presence of positive experiences such as pleasure. However scientific investigation of positive emotions has long been neglected. This paper addresses two main issues: first, it reviews the current state of scientific knowledge that supports the existence of positive affective states in animals and, second, it suggests possible applications of this knowledge that may enhance quality of life under animal management conditions. In the first part of the paper, recent advances in psychology and neuroscience are reviewed to provide pragmatic frameworks based on cognitive processes (such as positive anticipation, contrast and controllability) for further investigations of positive emotions in animals. Thereafter, the neurobiological bases of positive emotions are highlighted in order to identify behavioral and physiological expressions of positive experiences in animals. Monitoring both the autonomic nervous system (via heart rate and its variability) and the immune system could offer relevant tools to better assess emotional states in animals, complementary to classical adrenocortical measures. In the second part of the paper, useful strategies for enhancing positive experiences (such as physical, social and cognitive enrichment or putative genetic selection) are outlined. Then this paper emphasizes practical applications for assessing and promoting positive emotions that may help in providing animals with a better quality of life. Play, affiliative behaviors and some vocalizations appear to be the most promising convenient indicators for assessing positive experiences in laboratory and farm animals under commercial conditions.
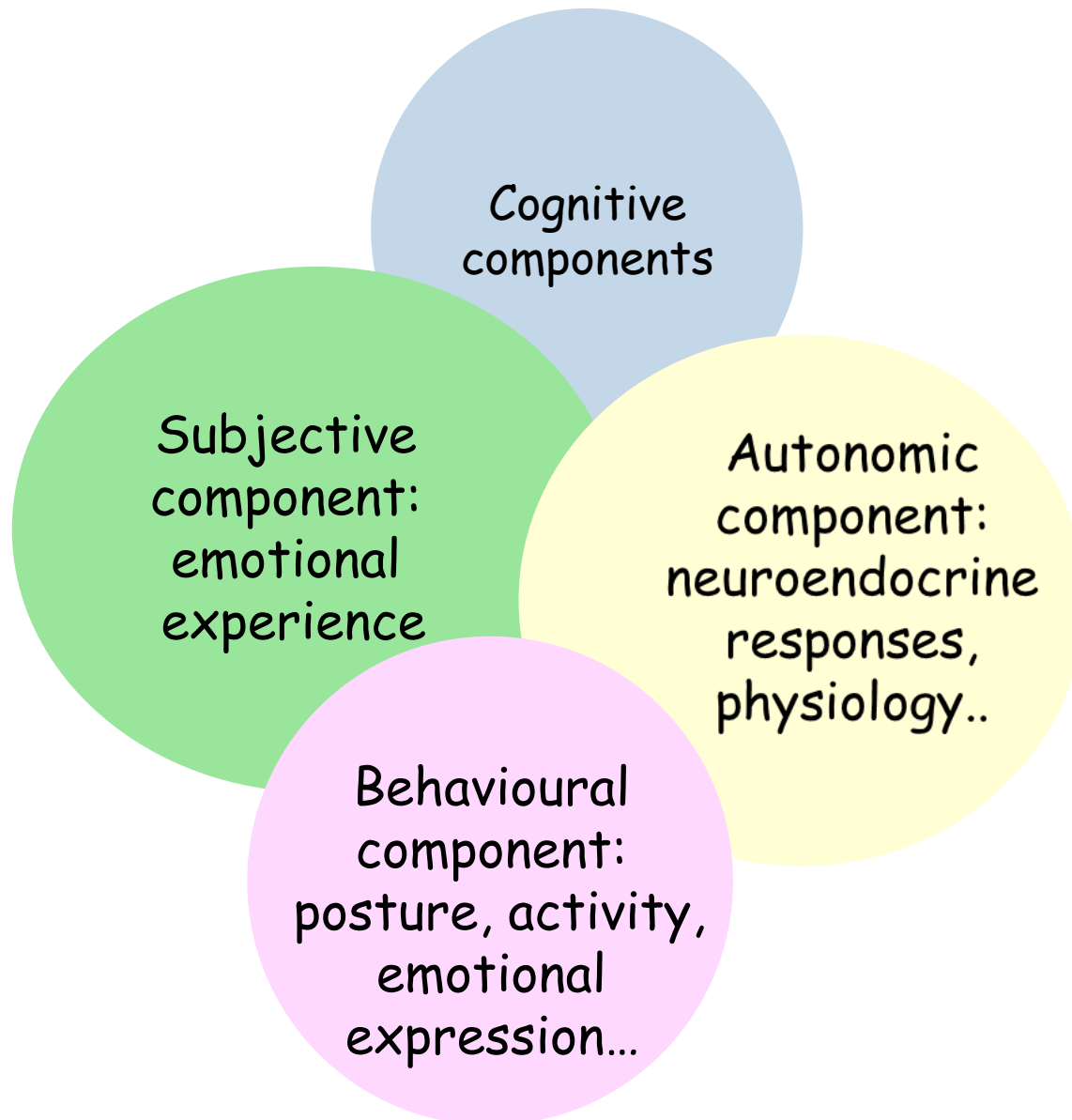© 2007 Elsevier Inc. All rights reserved.

Keywords: Positive emotion; Positive mood; Cognitive appraisal; Play; Grooming; Vocalization; Animal welfare

Scientific developments which inform us about animals' mental capacities for pleasant feelings play an important role in the development of animal welfare standards.

Components of emotions

Key research areas-
positive emotions in animals

- Cognitive components: Basic studies of cognitive abilities

- Behavioural components: Behavioural needs, preferences, motivation, behavioural expression

- Neuroscientific approaches, physiological correlates of «liking» and «wanting»

Do fish feel consciously?

Key research area:
Do fish feel pain?

What about positive
emotions?

Behavioural components:
What do animals **like** and how strong do they **want** it?

- Behavioural needs, preferences and motivation

Assessing behavioural needs

- Preferences: observation of a species under "natural" and restricted conditions
- Strength of motivation: Requiring an animal to "work" for the opportunity to perform specific behaviors or access of preferred rewards
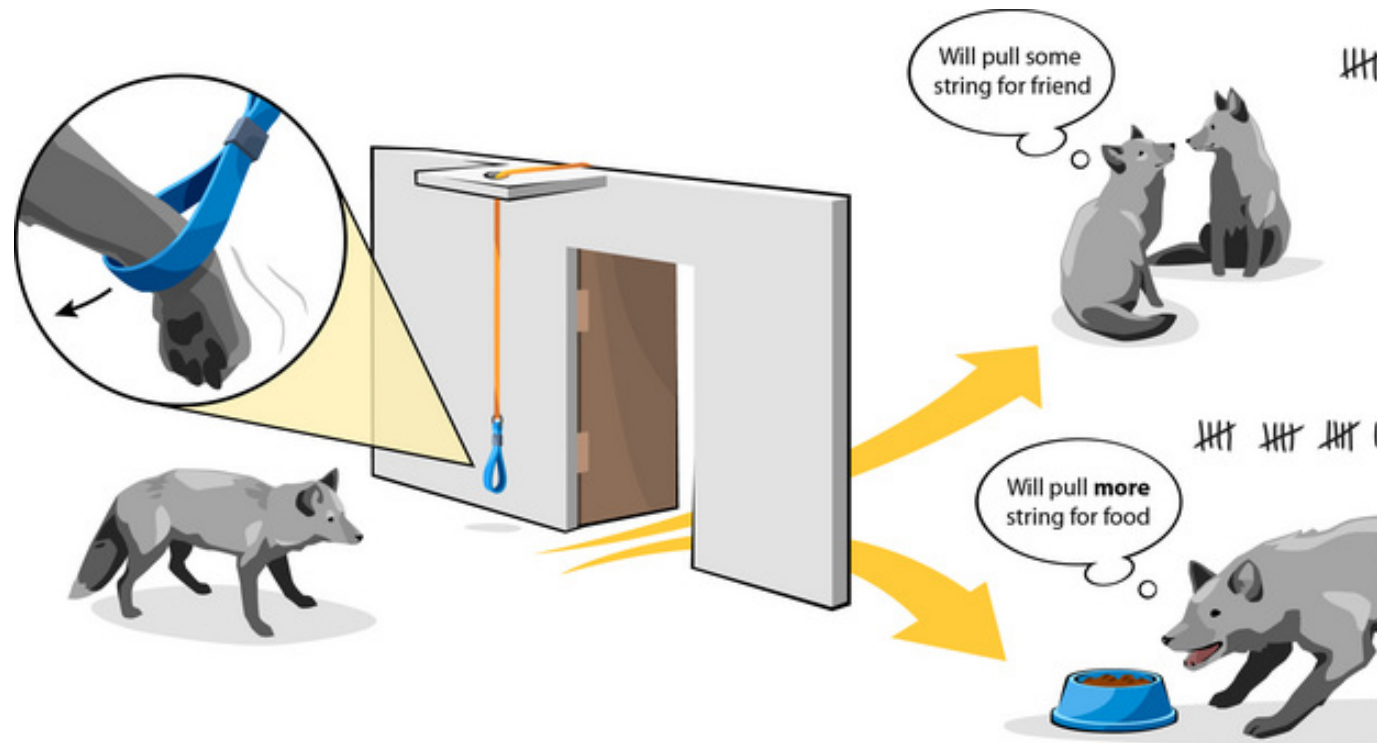
Testing preferences:

- Time budget: How often, time of day…
- Type of dustbathing or resting shelf material?
- Social behaviour?
- Location?

Testing strength of motivation: Operant techniques

Asks how hard an animal is willing to «work» to get access to a reward

Amdam, G. V. & Hovland, A. L. (2011) Measuring Animal Preferences and Choice Behavior. *Nature Education Knowledge* 2(11):6

Studies of motivated behaviours- some examples

Grooming

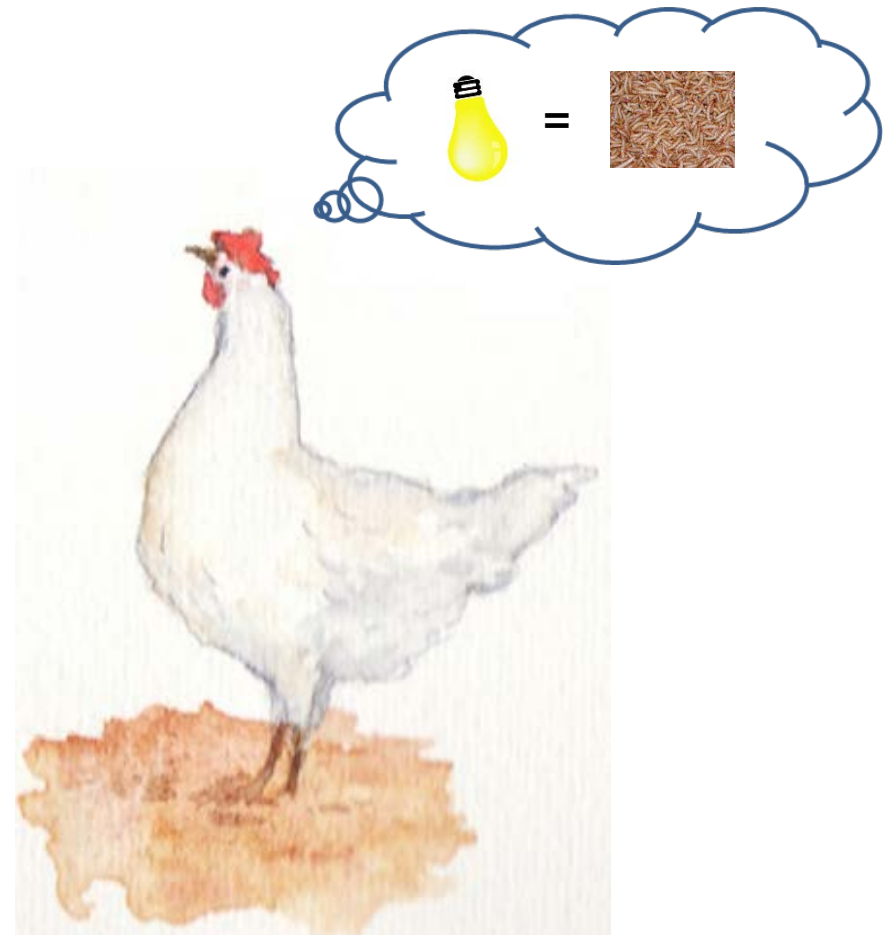# Shelter

Resting and sleep

Comfort behaviours

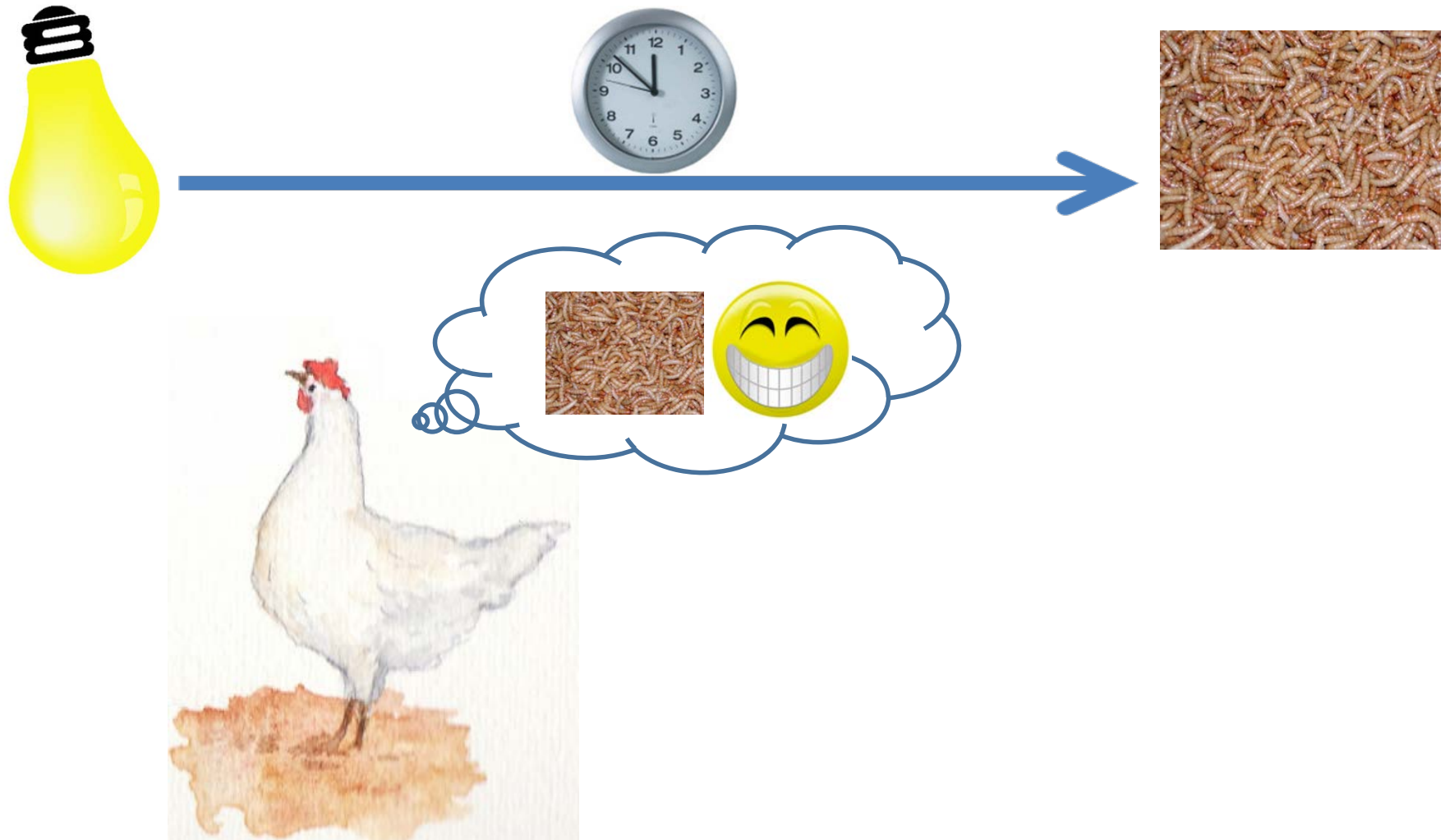# Play and exploratory behaviour

Foraging and appetitive behaviours

Methods for «cognitive enrichment»

Appetitive behaviours: Conditioning paradigms

Moe RO, Nordgreen J, Janczak AM, Spruijt BM, Zanella AJ, Bakken M. 2009. Trace classical conditioning as an approach to the study of reward-related behaviour in laying hens: a methodological study. Appl Anim Behav Sci, 121: 171-178
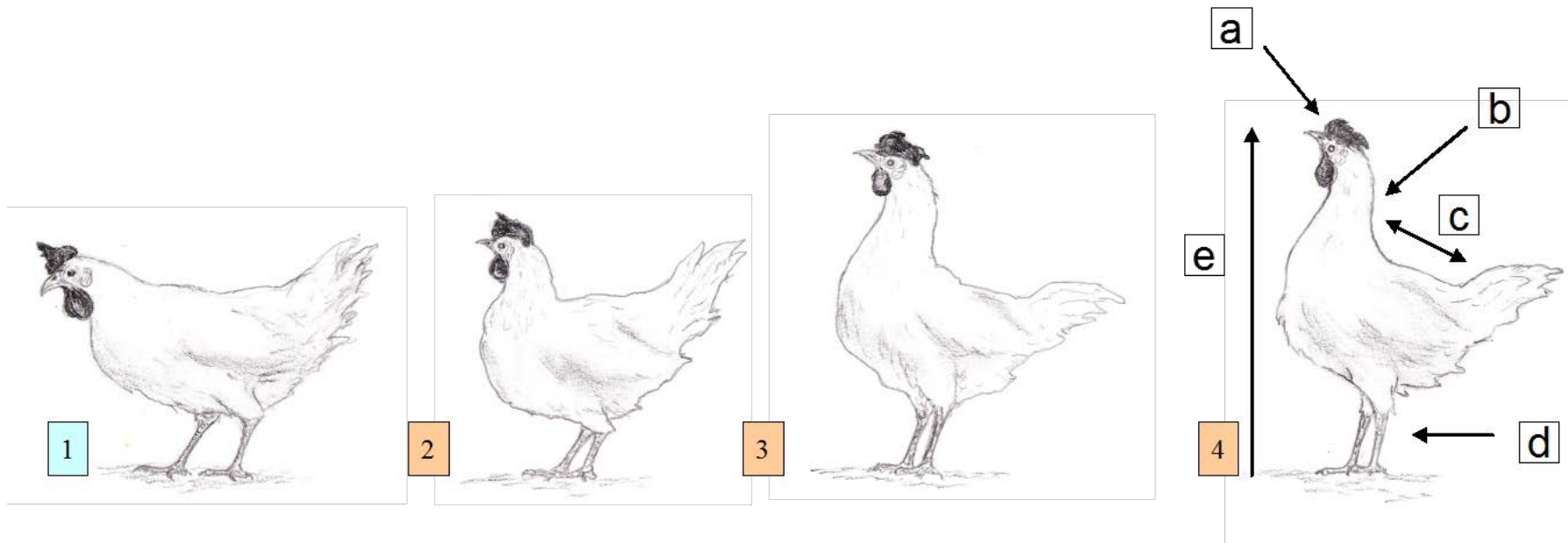
Anticipation: «Wanting» a «liked» reward

Moe RO, Nordgreen J, Janczak AM, Spruijt BM, Zanella AJ, Bakken M. 2009. Trace classical conditioning as an approach to the study of reward-related behaviour in laying hens: a methodological study. Appl Anim Behav Sci, 121: 171-178

# Reward-related anticipatory behaviour in hens

Moe RO, Nordgreen J, Janczak AM, Spruijt BM, Zanella AJ, Bakken M. 2009. Trace classical conditioning as an approach to the study of reward-related behaviour in laying hens: a methodological study. Appl Anim Behav Sci, 121: 171-178

«Wanting» a reward:
Activation of brain reward systems
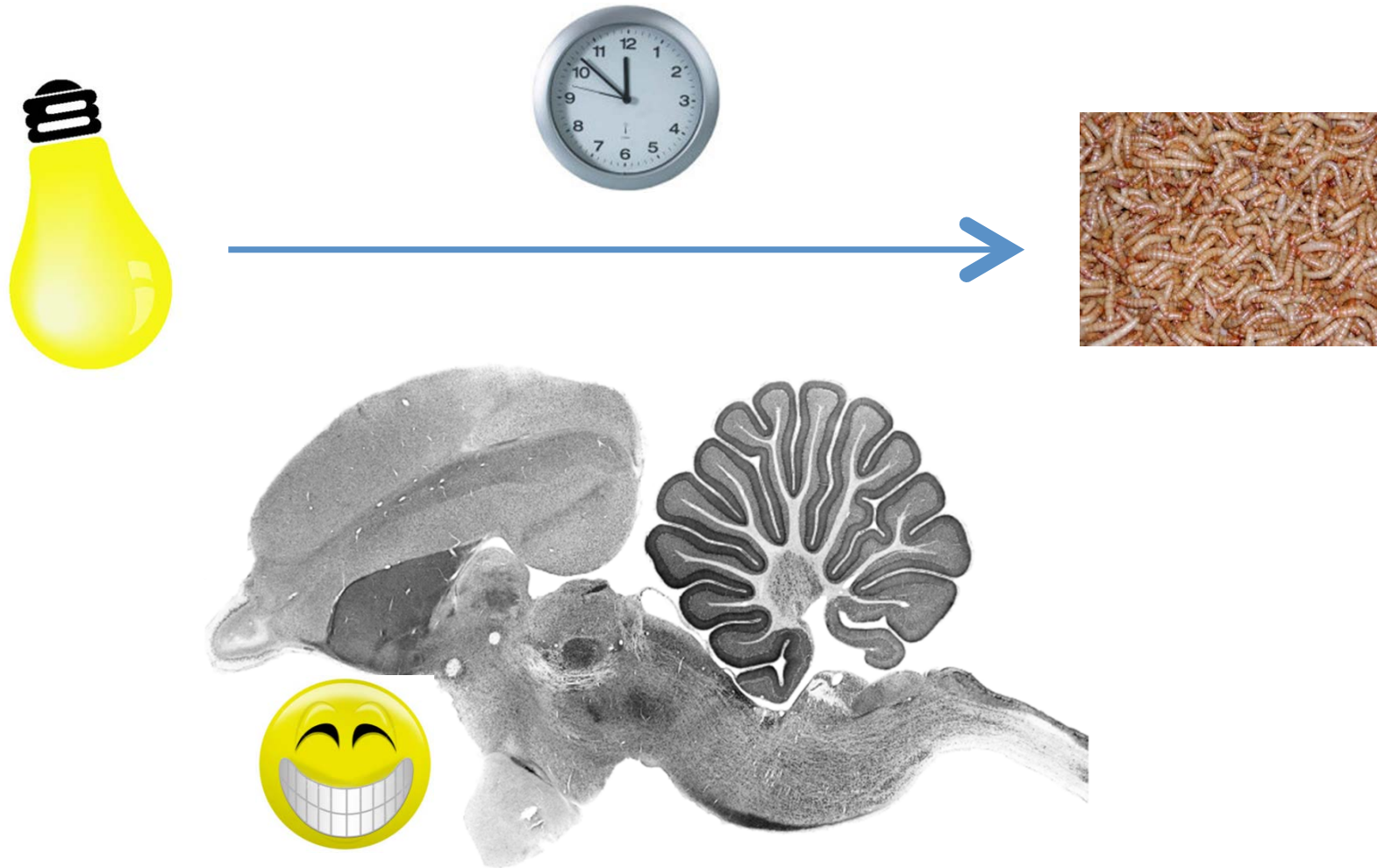
Moe RO, Nordgreen J, Janczak AM, Spruijt BM, Kostal L, Skjerve E, Zanella AJ, Bakken M. 2011. Effects of haloperidol, a dopamine D2-like receptor antagonist, on reward-related behaviors in laying hens. Physiology & Behavior 102; 400-405

Peripheral temperature drop during positive anticipation
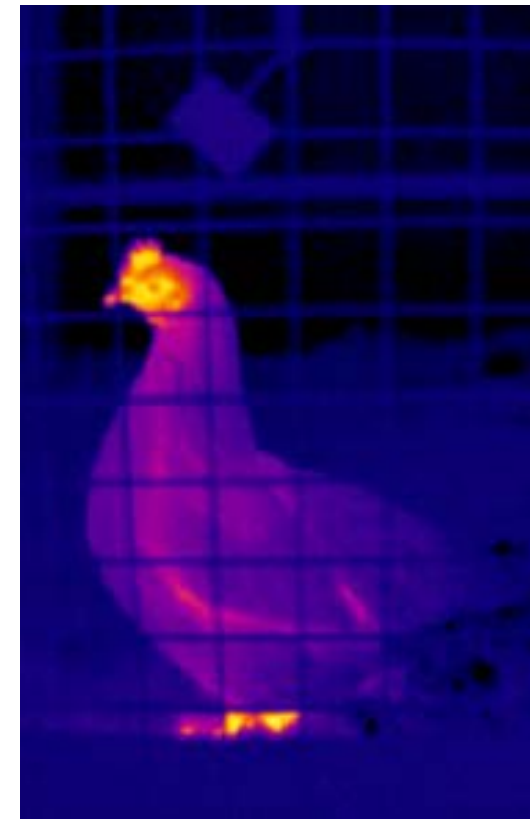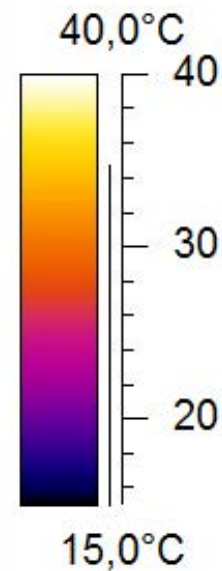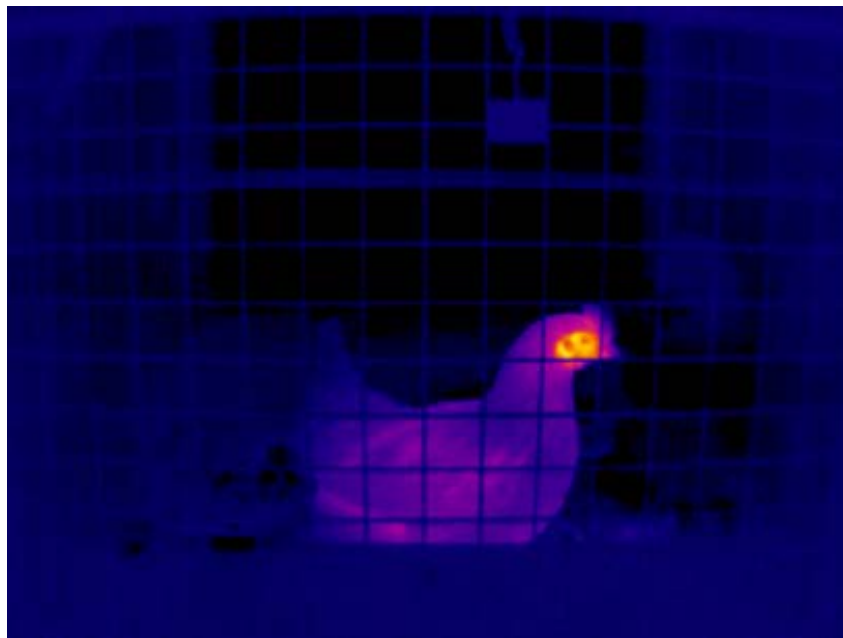
Moe RO, Stubsjøen SM, Bohlin J, Flø A, Bakken M. 2012.
Peripheral temperature drop in response to anticipation and consumption of a signaled palatable reward in laying hens (*Gallus domesticus*). Physiology & Behavior 106; 527–533

Emotional expressions

Anticipation of reward in farmed foxes

Moe RO, Bakken M, Kittilsen S, Kingsley-Smith H, Spruijt BM. 2006. A note on reward-related behaviour and emotional expressions in farmed silver foxes (*Vulpes vulpes*) – basis for a novel tool to study animal welfare. Appl Anim Behav Sci 101: 362-368

Summary

- Animal welfare is not only about the absence of suffering, but the possibility to experience some forms of positive emotional states

  – Include observations of positively motivated behaviours, play, positive social interactions and emotional expression in future welfare assessment / assurance schemes

  – More focus on feedrelated - and environmental enrichment including cognitive enrichment

Future research

- More basic studies about animals' mental capacities for and expression of pleasant feelings

- Practical «on-farm» or «in-lab» indicators for positive emotional states

Thank you!