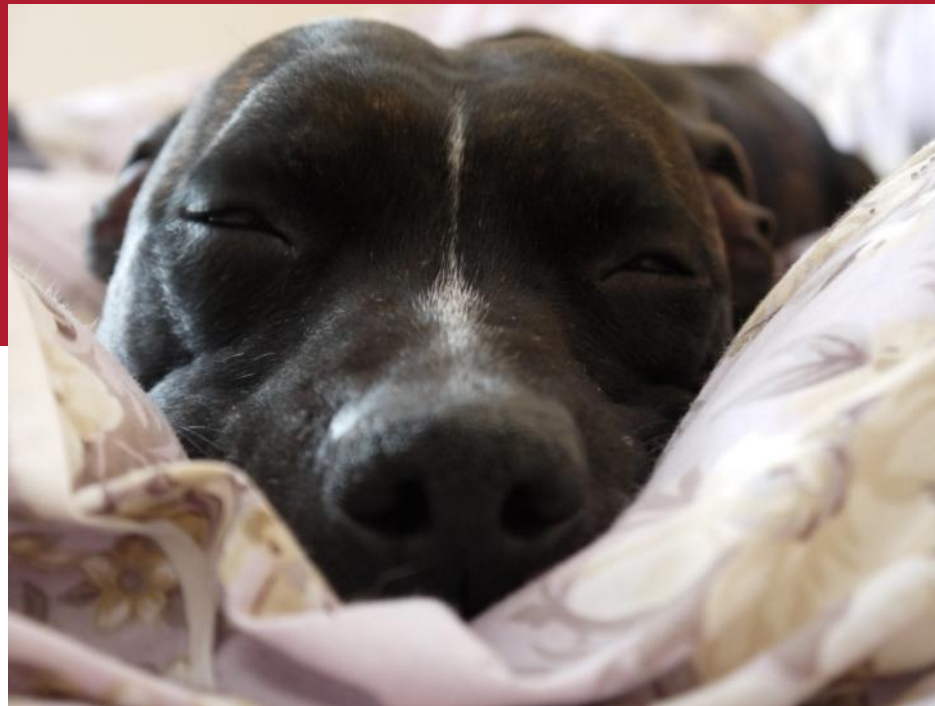


# How happy does a happy animal have to be

(and how can we tell)?

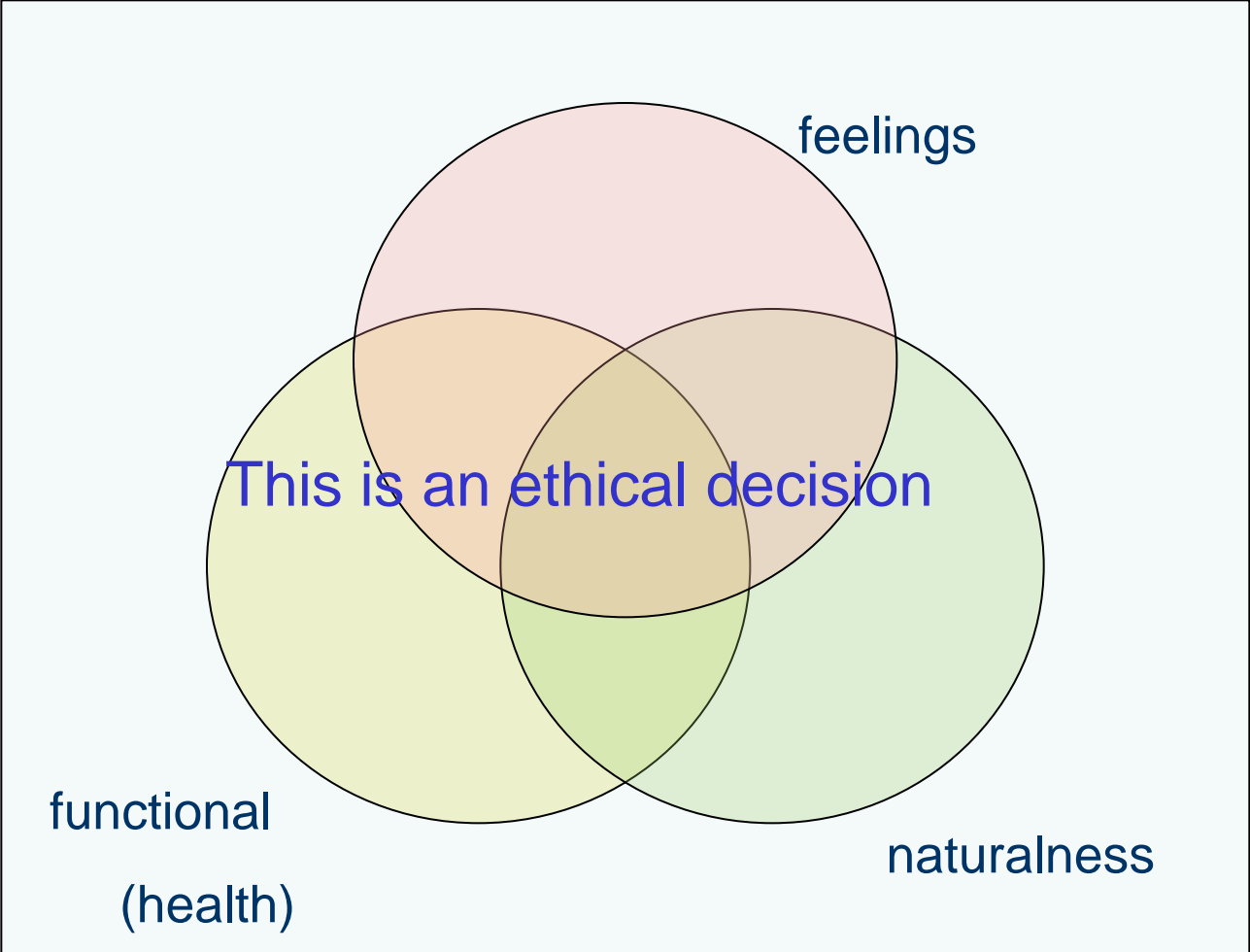


# Do we need definitions?

- We do not need a fixed definition for “animal welfare” so long as we can work out *what we should do*
- We cannot define others:
  - “veterinary”
  - “health”
- Same goes for happiness (... ?)



# What is welfare?



**FEELINGS, WHAT FEELINGS?**

# AW Judgements: Preferences v States

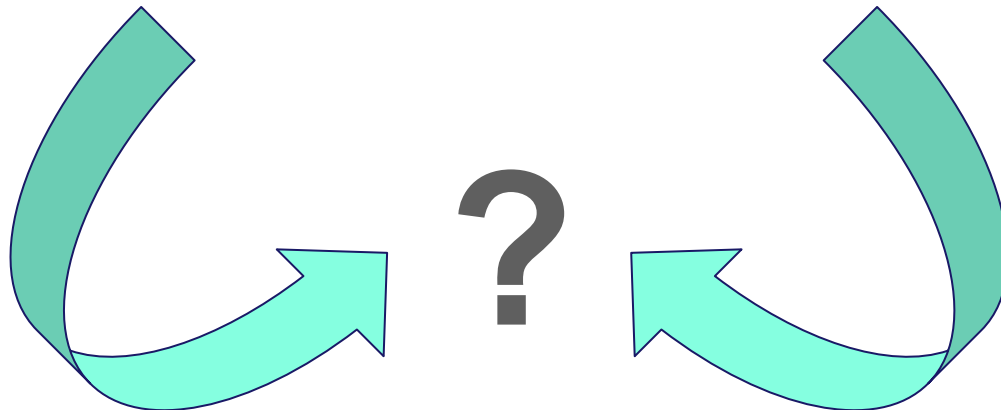
- Animal welfare looks at animals' feelings as



- Preferences
- (idealised)



- Objective states
- (animal –relativised)



# Relativity: Personal likes (and dislikes)

- My wife likes and I don't
  - Marmite (trans. Vegemite)
  - Men at Work
  - Cuddling
- I like and my wife doesn't
  - Wagnerian opera
  - Russian novels
  - High Renaissance Art



# Neurobiology: Affect v motivation

“(Dis)Liking”

= **Affect** is the feeling(s) associated with reward *per se*

“Wanting (to/from)”

= **Motivation** is the drive towards/away from an outcome

- Neurological differences
- Objects may differ [Berridge and Robinson, 2003; Kelley et al., 2005; Peciña et al., 2003; Wilson et al., 2006; Dayan and Balleine, 2002 ]
- But usually coincide [Zald and Depue, 2001; van Ree, Gerrits and Vandershuren (1999) Désiré et al., 2002]

# Assessing Welfare



- Assessing motivation

- Preferences (UC/C)
- Anticipation
- Latency
- Ethograms
- (+laundersing)



- Assessing affect:

- Physiology
- Vocalisations
- Expressions
- “*A priori*” behaviours
- (+ motivations)



# **ANIMAL WELFARE: A RANGE**

# Animal welfare range

## Affective states



- *Presence of unpleasant states*
- *Absence of pleasant states*

- *Presence of pleasant states*
- *Absence of unpleasant states*



## Motivations



- *Frustration of motivations from*
- *Frustration of motivations to*

- *Satisfaction of motivations to*
- *Satisfaction of motivations from*

# Animal welfare range over time

## Affective states



- Presence of unpleasant states
- (Frustration of motivations to)
- Absence of pleasant states
- Absence of unpleasant states
- Presence of pleasant states

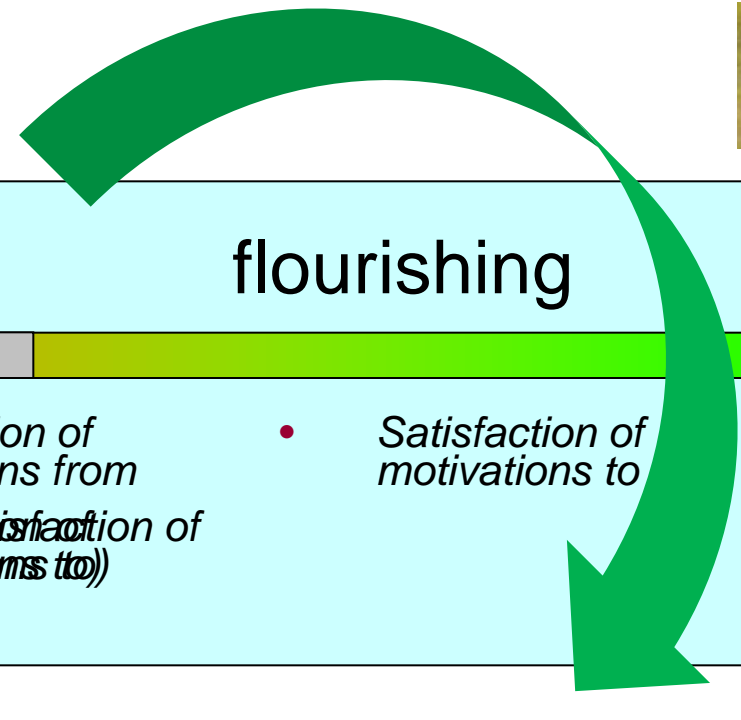
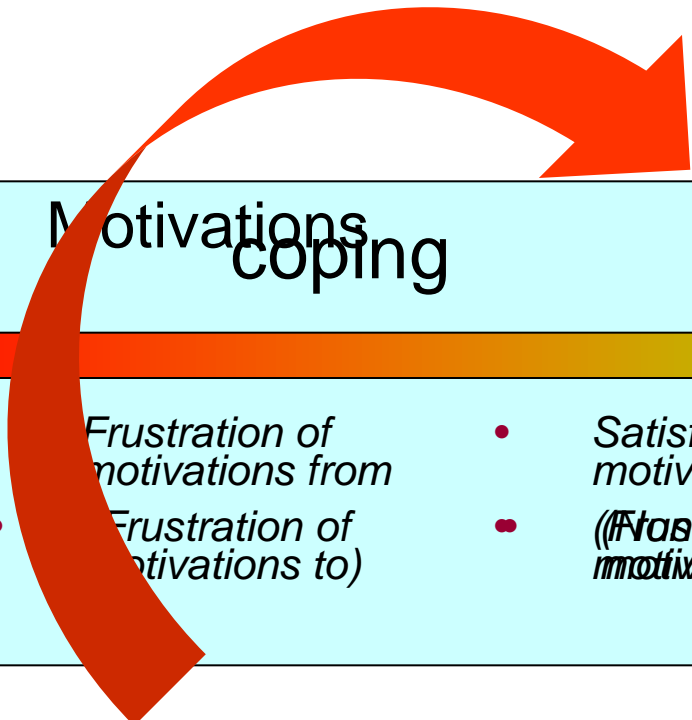


## Motivations coping

## flourishing

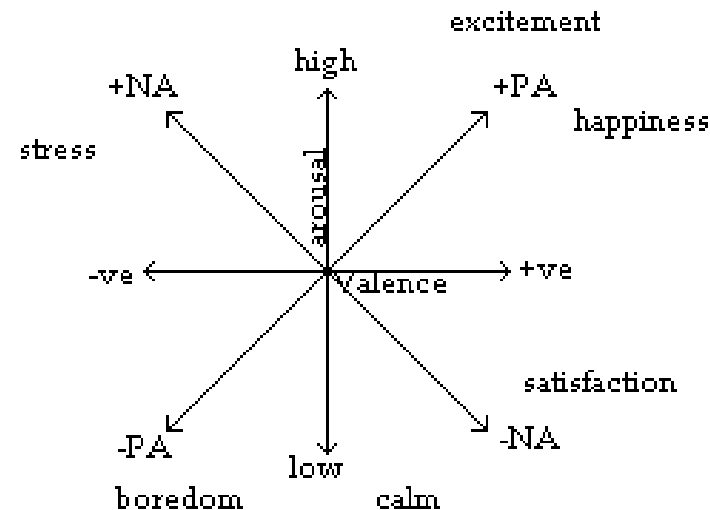


- Frustration of motivations from
- Frustration of motivations to)
- Satisfaction of motivations from
- (Frustration of motivations to))
- Satisfaction of motivations to



# Animal Welfare “Negativity”

- Focus on health
  - (no positive correlate?)
- ‘Death is not a welfare issue’
  - (absence of all states)
- Cortisol
  - (focus on negative arousal)





**POSITIVE WELFARE:  
GOOD THINGS IN LIFE**

# Assessing Positive Welfare

## **Affect** (liking)

- Physiology
- Vocalisations
- Expressions
- A priori: Play



## **Motivation** (wanting)

- Physiology
- Preferences
- Anticipation
- Latency
- Ethograms

**?(+NOT averse/unpleasant)?**

# M - Preferences: rats

- Rats traversed a T-maze for the opportunity to interact with another rat

[Humphreys & Einon 1981;  
Normansell & Panksepp 1990]

- **Conditioned**
  - **Social interactions**  
[Burns & Wiley 1984]
  - **Sex** [Hughes et al 1990]
  - **Social play**  
[Van den Berg et al 1999]



Image: Emily Godlevsky

# M - Preferences: cows



-maze

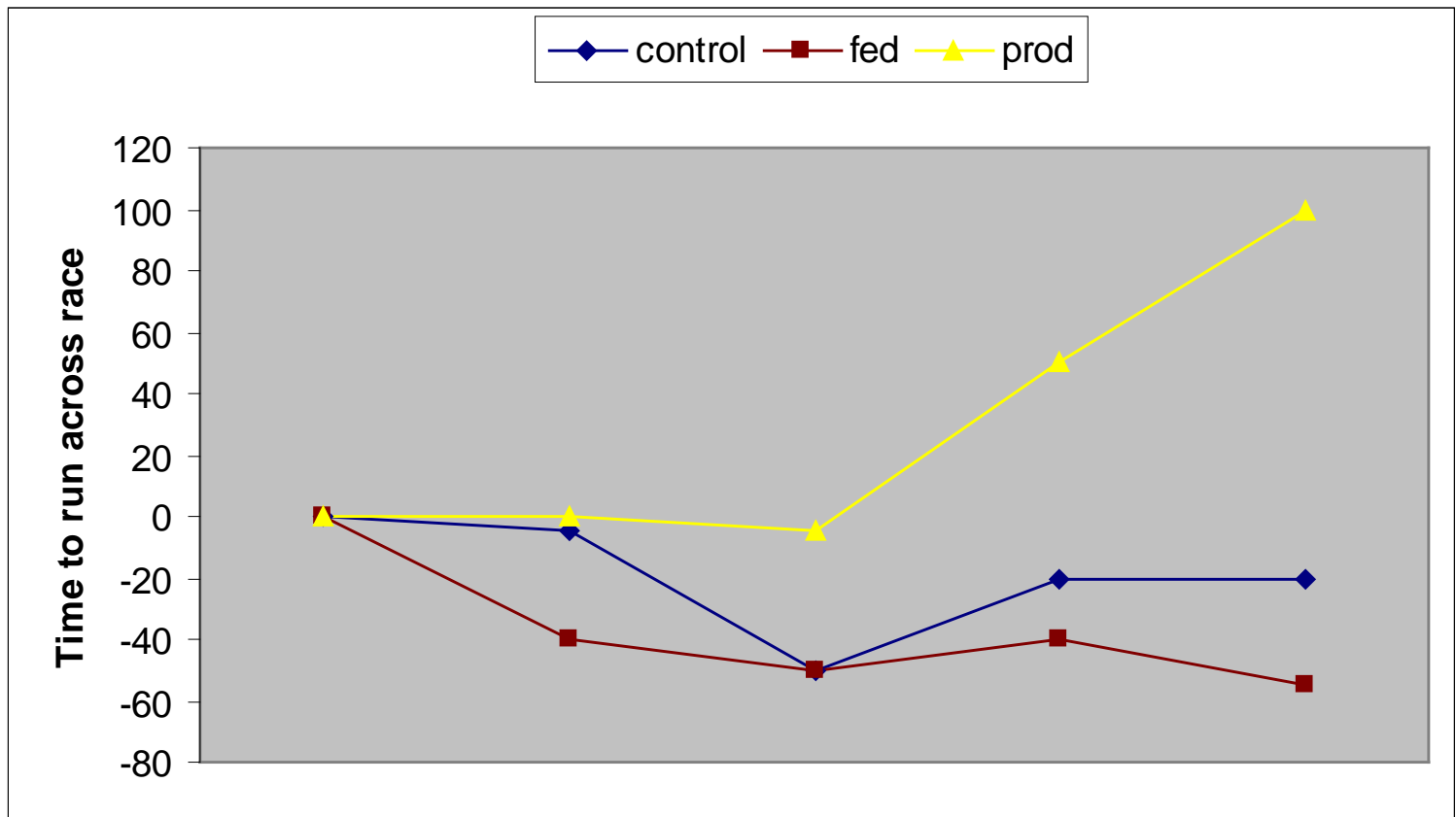
'gentling' vs palatable food [Pajor et al 2003]





# M – Latency: cows

- Time taken to run down race [Pajor et al 2000]



# M – Latency: cows



## Open Field Tests

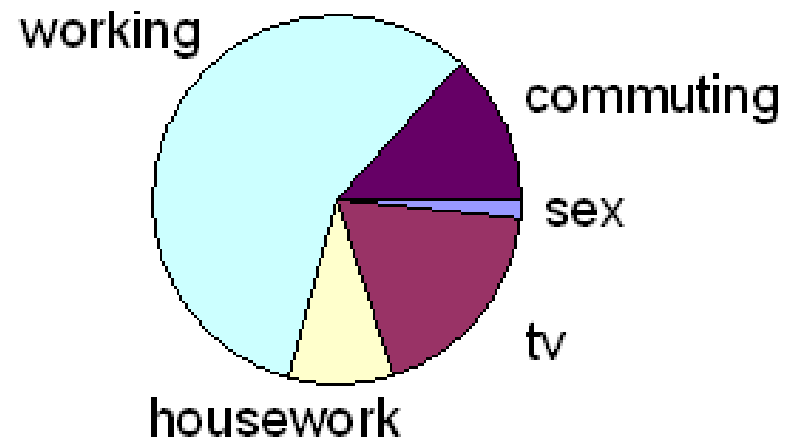
- Usually assessing:
  - “fear” (Van Reenan et al 2004, 2005)
  - agitation (Kilgour et al 2006)
  - nervousness (Warnick et al 1977) or
  - vigilance (Muller & Keyserlingk, 2006)
- But better (De Passille et al, 1995):
  - Fear (vocalisation; defaecation)
  - Exploration (sniffing; licking)
  - Locomotion (running; jumping)

# M – Ethogram: Texan Housewives

happiness



time spent

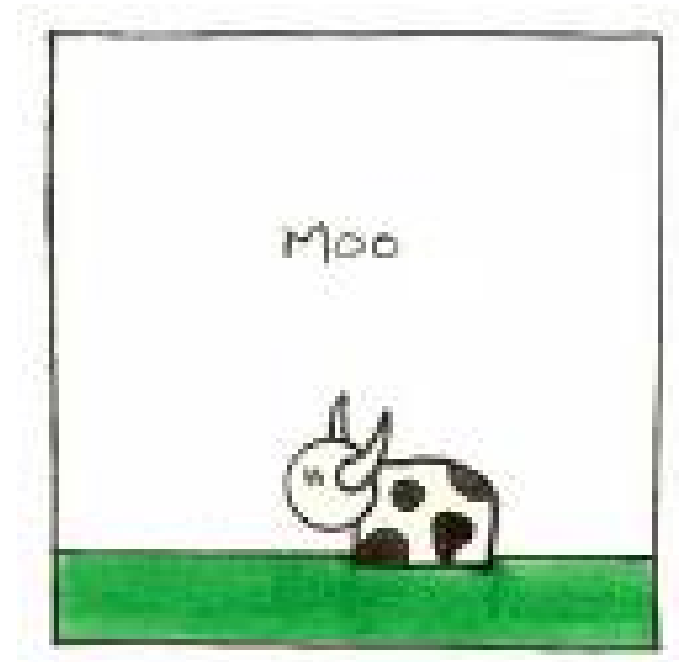


# A – Vocalisations

Ultrasonic



Jack Hynes  
<http://www.flickr.com/photos/jackhynes2350.tif>



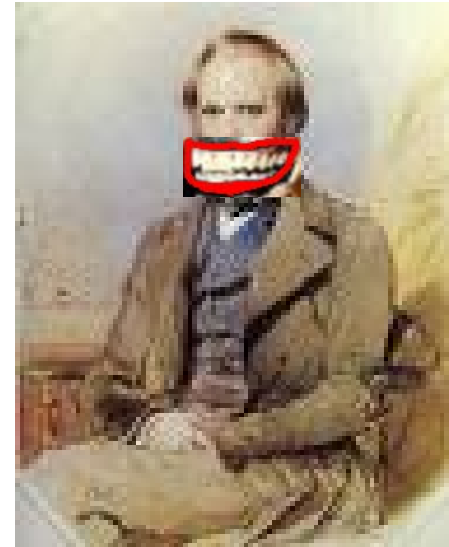
Ultrasonic chirping  
'Moos' and 'baanocks'

[Dellmeier et al 1985:

Knutson et al 2002]

# A – Expressions

- Facial expressions, e.g. on tasting sugar [Grill and Norgren 1978]
  - tongue protrusion
  - paw-licks
- Can be altered by opioid injections [Parker and others 1992; Doyle and others 1993; Peciña and Berridge 1995; Rideout and Parker 1996; Peciña and Berridge 2000]



# A – *a priori* pleasures: Play



Calves in groups spend more time playing

[Jensen et al 1998]

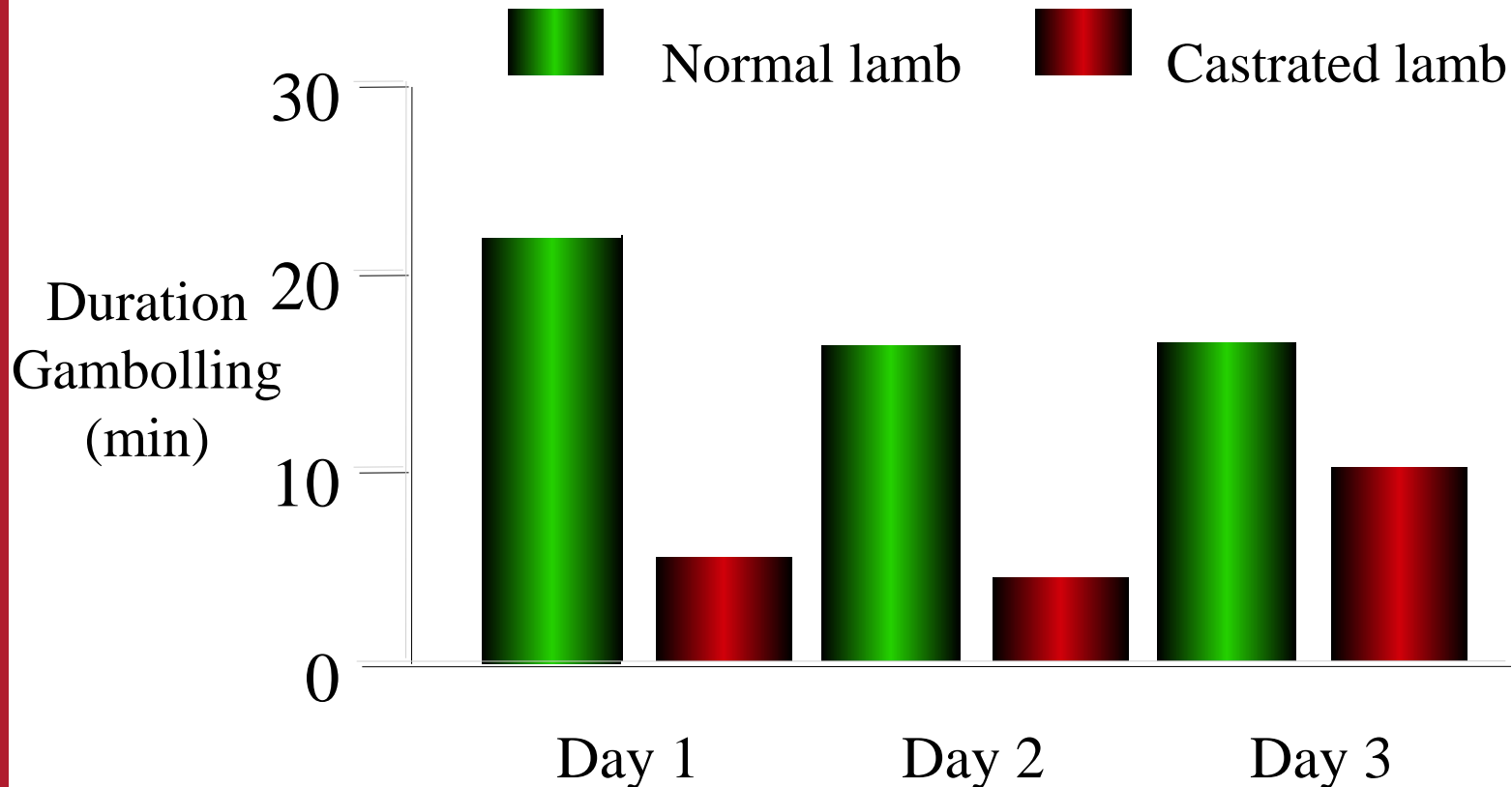
Hydraulic drive for play

[Holloway & Sutter (2004)]



# Play pre-potency?

Fraser and Duncan (1998) : "all is well in the world"



castrated lambs gambol less

Mouttoutu and Green (1999)

# Positive Outcomes

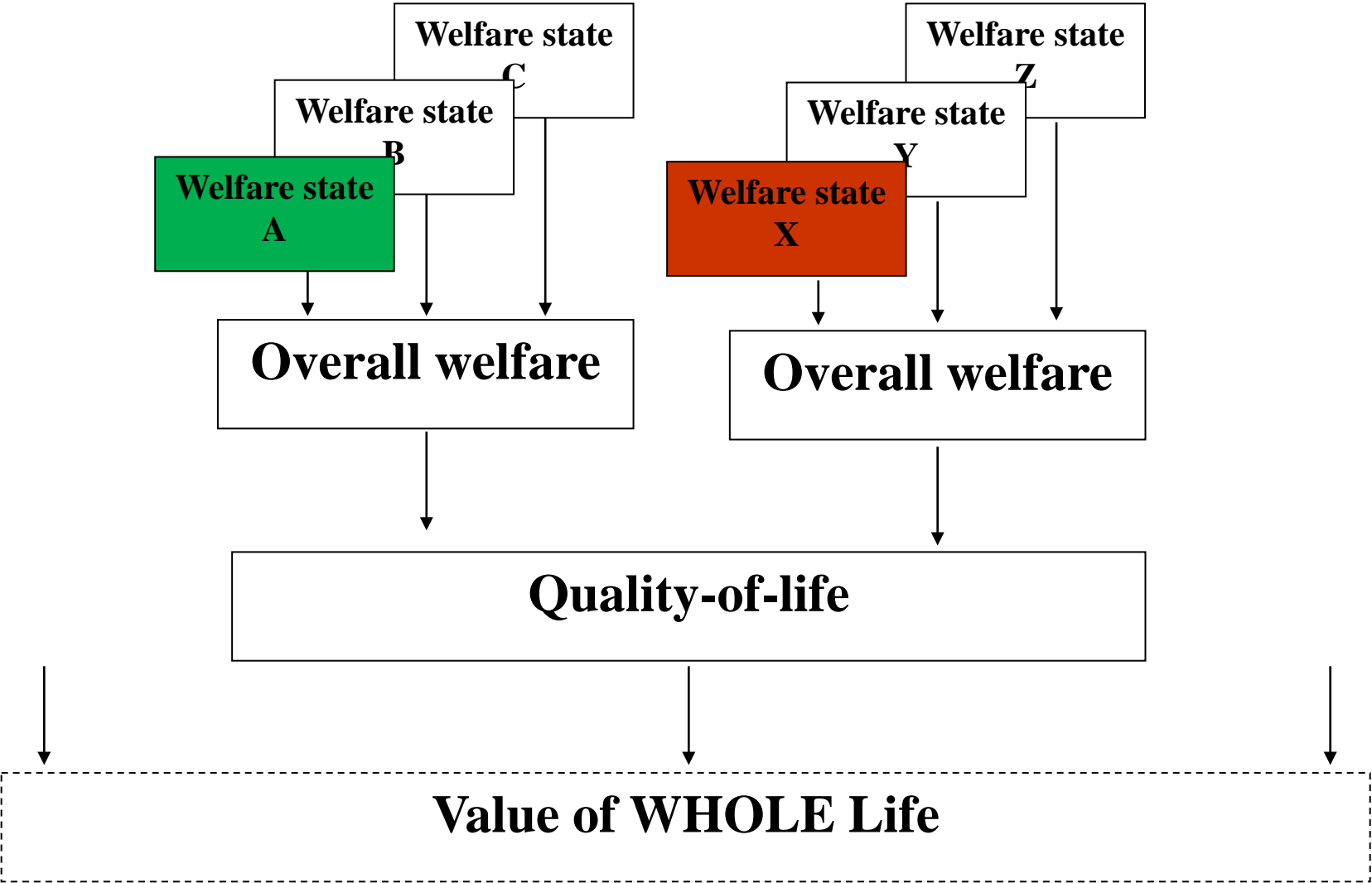
+ve outcome	-ve outcome
<b>A "Pleasures"</b>	
Eating	<i>Hunger</i>
Play	<i>Lethargy ?</i>
Tactile pleasure	<i>Pain</i>
Exercise	<i>Frustration ?</i>
Sex	<i>Frustration ?</i>
Sleep	<i>Fatigue</i>
Warmth	<i>Coldness</i>
<b>B "Engagement"</b>	
Other Animals	<i>Loneliness; separation anxieties</i>
Family	<i>Lack of nurture; behavioural needs</i>
Humans	<i>Poor handling, disturbance</i>
Curiosity / Interest	<i>Fear, apathy</i>
Variety / Novelty	<i>Boredom</i>
<b>C "Realisation"</b>	
Control	<i>Frustration, apathy</i>
Space	<i>Insufficient space</i>



# Life Worth Living

**Figure 1: welfare states, overall welfare, quality-of-life and value of life**

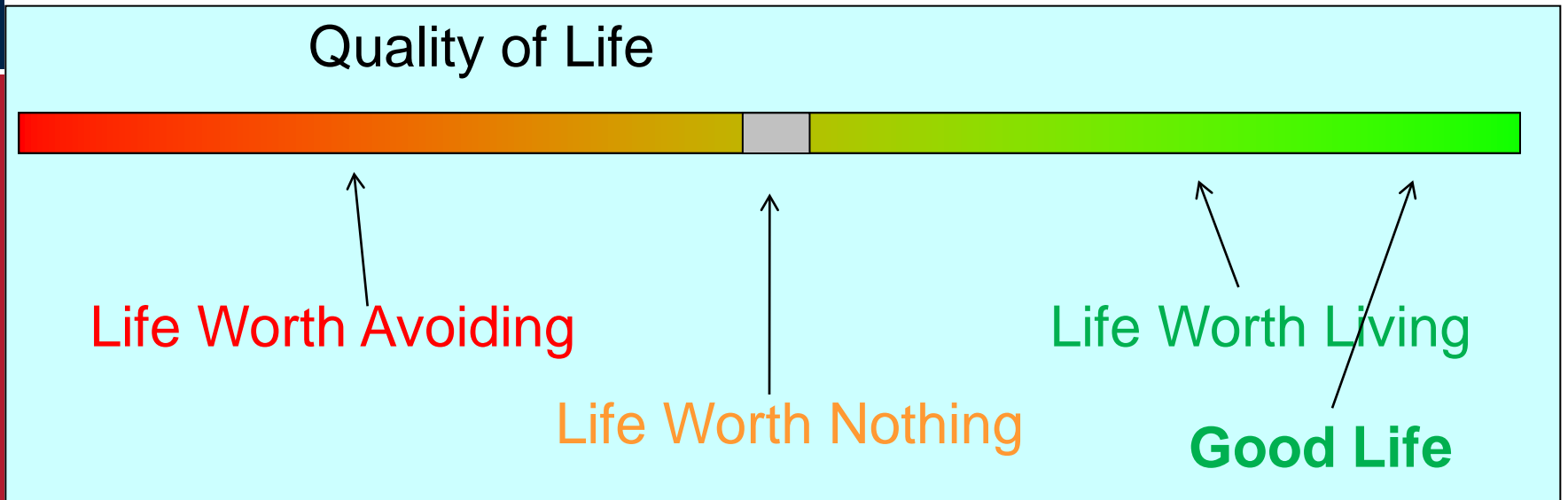
Yeates 2011a



# LWL/LNWL/LWA

- Some animals benefit from an overall positive life = **Life Worth Living**
- Some animals may be better off dead = **Life Worth Avoiding / Not Living**
- Some animals may be neither better of living nor better off not living, e.g. a life without experiences = **a Life Worth Nothing**

# Life's worth



– Relative to absence/non-satisfaction:

- being dead
- (UGA)

# Principles of LWL



- Maximin
  - Every animal should have a LWL
  - No animal should have a LWA
- Plus minimise harms etc
- Win-win:
  - Benevolent vs exploitative farming/research

# Death and welfare

- Classic position: death insignificant
- Death *deprives* – positive or negative

Hence Humane endpoints in the 3Rs

Death is not a welfare issue

Hence Humane endpoints in the 3Rs

I just said that



# Euthanasia vs Extending Life

## Quality of Life

*Hunger & Thirst*  
*Fear & Distress*  
*Pain, Injury & Disease*  
*Discomfort*  
*Restrict behaviour*

- *Pleasures*
- *Happy*
- *Play*

## Quantity of Life

• *Shortened life*

• *Extended life*



# Euthanasia?

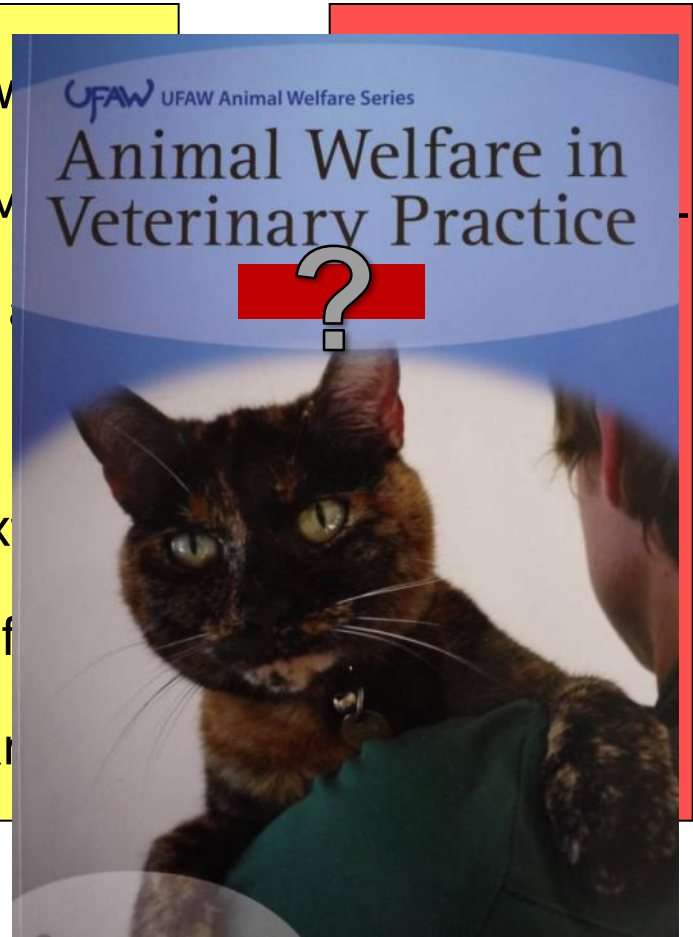
Only way to  
avoid -v

One w  
avoid -v  
or that

**AVAILABLE TO  
PRE-ORDER  
NOW**

Ideal  
Euthanasia

Context  
justif  
Euthan





# Breeding



... And Supporting

# Making decisions

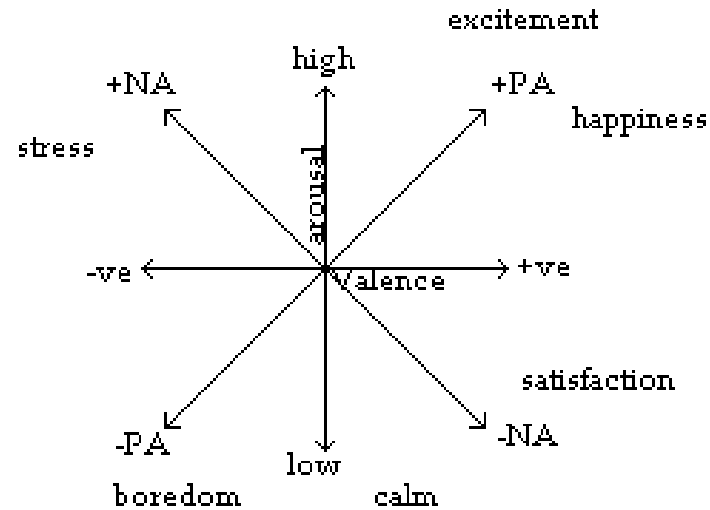
- If causing certain harms then *compensate*
- Harms caused in research: experimentation
  - Compensate in husbandry
- Harms caused in farming: transport/slaughter
  - Compensate in enrichment



# **THE FUTURE?: BEYOND COPING**

# Positive welfare measures

- Behavioural measures
  - Motivation vs affect



- Physiological measures?
  - (Cortisol etc re arousal), neuroendocrine
  - Triangulation and assumptions

# Individualisation



- Intensional
  - Not “species-specific” but “Jake-specific”
  - Tailored to expressed personality/history
- Reflexive concepts
  - Self-determination
  - Autonomy, choice, control

# “Objective” measures

- Opportunities
- Choice
- Capabilities
- Liberty
- Achievement/fulfillment
- Longevity
- Naturalness



# Five Opportunities

- Opportunity for **selection of dietary inputs**

*(by provision of a diet that is preferentially selected)*

- Opportunity for **control of environment**

*(by allowing the achievement of motivations)*

- Opportunity for **pleasure, development and vitality**

*(by maintaining and improving beneficial inputs)*

- Opportunity to **express normal behaviour**

*(by providing sufficient space, a proper range of facilities and the company of the animal's own kind)*

- Opportunity for **interest and confidence**

*(by providing conditions and treatment which lead to mental enjoyment)*

# Good life

Does the animal's life meet the **LWL** criterion?

Y

Does the animal's life meet the **Good Life** criterion?

Opportunities

Longevity

Naturalness

Y

Y

Y

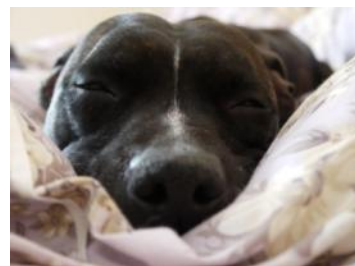
and or or

Good  
Life





**THANK YOU  
RSPCA Australia  
Animal Welfare Science Centre  
University of Melbourne**



**FOR LISTENING**