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?

This is an ethical decision

feelings

functional (health)

naturalness
FEELINGS, WHAT FEELINGS?
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
  – (+laundering)

• 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

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

flourishing

- 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]
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]

![Graph showing time to run across race for different conditions.](image)
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

A – Vocalisations

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

[Holloway & Sutter (2004)]

Hydraulic drive for play

[Holloway & Sutter (2004)]
Play pre-potency?

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

Mouttotou and Green (1999)

castrated lambs gambol less
## Positive Outcomes

<table>
<thead>
<tr>
<th>Positive Outcomes</th>
<th>Negative Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A &quot;Pleasures&quot;</strong></td>
<td></td>
</tr>
<tr>
<td>Eating</td>
<td>Hunger</td>
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<tr>
<td>Play</td>
<td>Lethargy ?</td>
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<tr>
<td>Tactile pleasure</td>
<td>Pain</td>
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<tr>
<td>Exercise</td>
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<tr>
<td>Sex</td>
<td>Frustration ?</td>
</tr>
<tr>
<td>Sleep</td>
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</tr>
<tr>
<td>Warmth</td>
<td>Coldness</td>
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<tr>
<td><strong>B &quot;Engagement&quot;</strong></td>
<td></td>
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<tr>
<td>Other Animals</td>
<td>Loneliness; separation anxieties</td>
</tr>
<tr>
<td>Family</td>
<td>Lack of nurture; behavioural needs</td>
</tr>
<tr>
<td>Humans</td>
<td>Poor handling, disturbance</td>
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<tr>
<td>Curiosity / Interest</td>
<td>Fear, apathy</td>
</tr>
<tr>
<td>Variety / Novelty</td>
<td>Boredom</td>
</tr>
<tr>
<td><strong>C &quot;Realisation&quot;</strong></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Frustration, apathy</td>
</tr>
<tr>
<td>Space</td>
<td>Insufficient space</td>
</tr>
</tbody>
</table>
Life Worth Living
Figure 1: welfare states, overall welfare, quality-of-life and value of life

Yeates 2011a
LWL/LNWNL/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

Quality of Life

Life Worth Avoiding
Life Worth Nothing
Life Worth Living
Good Life

– Relative to absence/non-satisfaction:
  - being dead
  - (UGA)

FAWC 2009, Yeates 2011a,b, Mellor 2012
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?

One way to avoid –ve QOL for that animal

Contextually-justified Euthanasia

Doesn’t avoid –ve QOL for that animal

Not Euthanasia

Only way to avoid –ve QOL for that animal

Ideal Euthanasia

AVAILABLE TO PRE-ORDER NOW

Animal Welfare in Veterinary Practice
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

Boissy et al 2007; Yeates & Main 2008
Individualisation

• Intensional
  – Not “species-specific” but “Jake-specific”
  – Tailored to expressed personality/history

• Reflexive concepts
  – Self-determination
  – Autonomy, choice, control

Yeates in press, JAAWS
“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)*

Parker & Yeates 2011 EVJ
Good life

Does the animal’s life meet the LWL criterion?

Does the animal’s life meet the Good Life criterion?

Opportunities

Longevity

Naturalness

Good Life
THANK YOU
RSPCA Australia
Animal Welfare Science Centre
University of Melbourne
FOR LISTENING